RESERVOIR GROUP

Scale: 5" / 100'
Measured Depth Log

Well Name	Hingley 1I-18H-A167		
Location	Sec. 18 T1N R67W		
State	Colorado	**County**	Weld
Country	USA	**Rig Number**	Ensign 153
API Number	05-123-47164	**AFE #**	16191341
Geographic Region	Rockies	**Field**	Wattenberg
Spud Date	10/24/2019	**Drilling Completed**	10/26/2019
Surface Coordinates	Lat/Long (NAD83): 40.05706/-104.925887 SHL: Sec 18 T1N R67W Footage: 514 FNL 537 FEL		
Bottom Hole Coordinates	Proposed BHL: Sec 18 T1N R67W Footage: 460 FSL 470 FEL		
Ground Elevation	5,058'	**K.B. Elevation**	5,081'
Logged Interval	6,850' **To** 12,432'	**Total Depth**	12,432'
Formation	C Chalk		
Type of Drilling Fluid	Synthetic Oil Based Mud (Neoflo Base Oil)		

Operator

Company Crestone Peak Resources

Address 1801 California Street, Suite 2500
Denver, CO 80202

CRESTONE PEAK
RESOURCES

Geologist

Name John Ready

Company Crestone Peak Resources

Address 1801 California Street, Suite 2500
Denver, CO 80202

CRESTONE PEAK
RESOURCES

Color Coding

Oil	Condensate	Gas
Note	Core	Pressure
Error	Water	Seal

Other

Loggers: Tom Yull, Thor Trueblood

Services Provided: 2-Man Mudlogging

Equipment: ML-513

Contractor: Reservoir Group
14103 Interdrive
W. Houston, Texas, 77032

Service Start Date: 10/24/2019

Service End Date: 10/28/2019

Job # 2534RK1910

Rock Types

- UNKNOWN
- ANHYDRITE
- GYPSUM
- SALT
- SIDERITE or LIMONITE
- LIMESTONE
- DOLOMITE
- CHERT
- COAL
- MARLSTONE
- CHALK
- SHALE
- SHALE GRAY
- SHALE COLORED
- SILTSTONE
- SANDSTONE
- CONGLOMERATE
- BRECCIA
- TILL
- BENTONITE
- TUFF
- IGNEOUS
- METAMORPHIC
- CEMENT
- No Sample

Accessories

Fossils

- ALGAE
- AMPHIPORA
- BELEMNITE
- BIOCLASTIC
- BRACHOIPOD
- BRYOZOA
- CEPHALOPOD
- CORAL
- CRINOID
- ECHINOID
- FOSSIL
- GASTROPOD
- OOLITE
- OSTRACOD
- PELECYPOD
- PELLET
- PISOLITE
- PLANT REMAINS
- PLANT SPORES
- SCAPHOPOD
- STROMATOPOROID
- ARGILLACEOUS
- ARGILLITE GRAIN
- BENTONITE
- BITUMENOUS SUBSTANCE
- BRECCIA FRAGMENTS
- CALCAREOUS
- CARBONACEOUS FLAKES
- CHTDK
- CHTLT
- COAL - THIN BEDS
- DOLOMITIC
- FELDSPAR
- GLAUCONITE
- GYPSIFEROUS
- HEAVY MINERAL
- KAOLIN
- MARLSTONE
- MINERAL CRYSTALS
- NODULES
- PHOSPHATE PELLETS
- PYRITE
- SALT CAST
- SANDY
- SILICEOUS

Stringer

- ANHYDRITE STRINGER
- BENTONITE STRINGER
- COAL STRINGER
- DOLOMITE STRINGER
- GYPSUM STRINGER
- LIMESTONE STRINGER
- MARLSTONE (CALC) STRG
- MARLSTONE (DOL) STRG
- SANDSTONE STRINGER
- SHALE STRINGER

FISH
FORAMINIFERA

Minerals

ANHYDRITIC
FERRUGINOUS PELLET
FERRUGINOUS
SILTY
TUFFACEOUS
SILTSTONE STRINGER

Other Symbols

Oil Show

DEAD
EVEN
QUESTIONABLE
SPOTTED STAINING

Porosity

EARTHY
FENESTRAL
FRACTURE
INTERCRYSTALLINE
INTEROOLITIC
MOLDIC
ORGANIC
PINPOINT
VUGGY

Engineering

BIT
CASING
CONNECTION (LEFT)
CONNECTION (RIGHT)
CONNECTION GAS
CORE - LOST
CORE - RECOVERED
DST INTERVAL
FAULT
FORMATION TOP
GAS SHOW
MN DEPTH
NORMAL FAULT
OIL SHOW
OVERTURNED STRATA
REVERSE FAULT
SIDEWALL CORE (LEFT)
SIDEWALL CORE (RIGHT)
SLIDE
SURVEY
TRIP GAS
WIRELINE TESTED - LEFT
WIRELINE TESTED - RT

Rounding

ANGULAR
ROUNDED
SUBANG
SUBRND

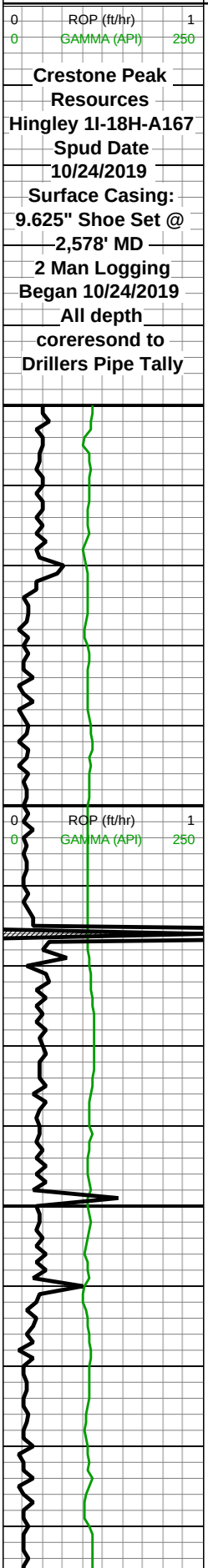
Textures

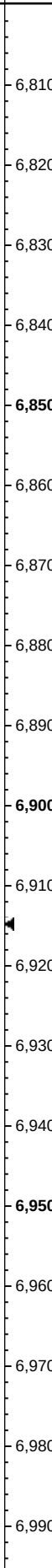
BOUNDSTONE
CHALKY
CRYPTOXLN
EARTHY
FINELYXLN
GRAINSTONE
LITHOGRAPHIC
MICROXLN
MUDSTONE
PACKSTONE
WACKESTONE

Sorting

MODERATE
POOR
WELL

ROP	Slide/Rotate	Depth Labels	Notes	% Lith	Total Gas	Lithology Descriptions	Images
ROP GAMMA					GAS C1 C2 C3 C4 C5 Pason Gas		

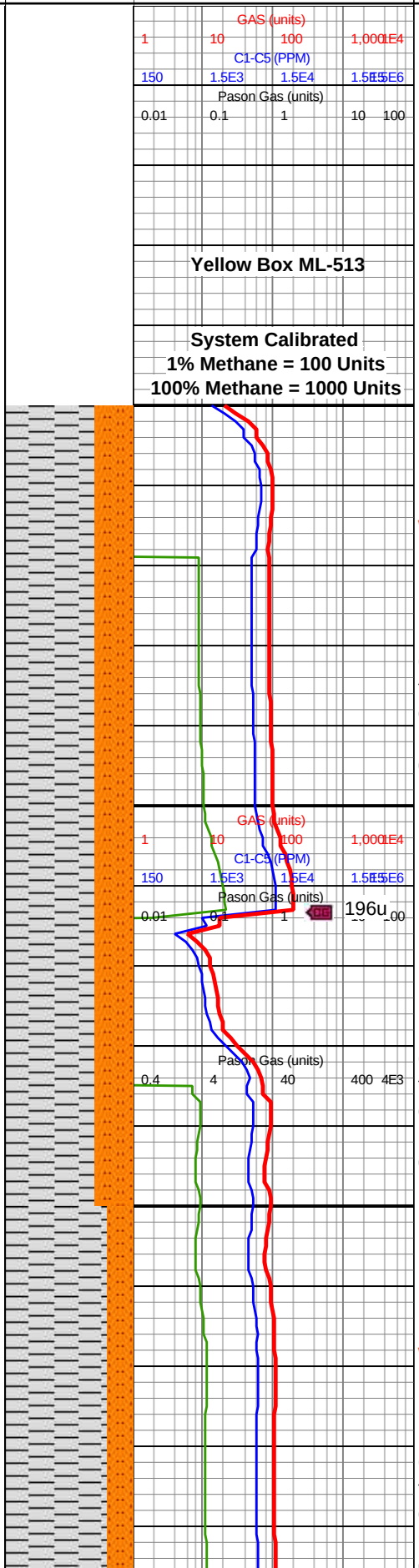




Bit #: 1
Type: U516M-PDC
Size: 8.5
Depth In: 2,595'
Depth Out: 12,432'
Hours: 32.6 hrs
Avg Ft/Hr: 301.74 '/hr
Jets: 6X13
S/N: 50063

MW IN: 10
VIS IN: 48
MW OUT: 10
VIS OUT: 46

MD: 6,938'
INC: 6.94°
AZM: 178°
TVD: 6,893.37'
VS: -740.28'



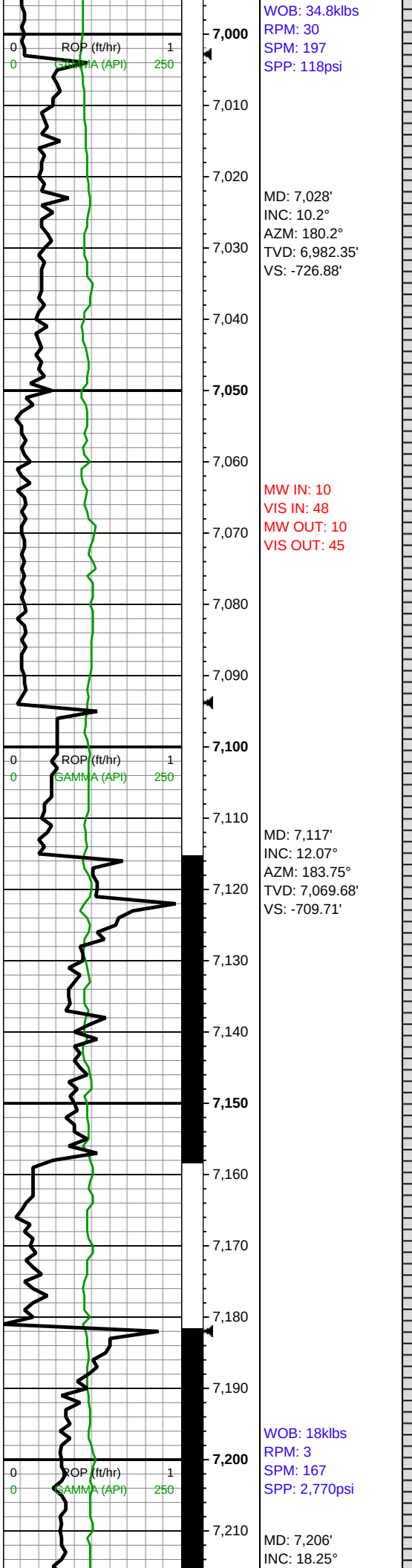
No water, samples washed in diesel

6850-6900 70% SH: lt br to dk gy, fri to frm, non calc slty txt, fis plty to sb plty; 30% SLTST: gy to lt gy, plty to sb plty non calc rthy txt, sft to frm

6900-6950 70% SH: lt br to dk gy, fri to frm, non calc slty txt, fis plty to sb plty; 30% SLTST: gy to lt gy, plty to sb plty non calc rthy txt, frm

No water, samples washed in diesel

6950-7000 80% SH: lt br to dk gy, fri to frm, non calc slty txt, fis plty to sb plty; 20% SLTST: gy to lt gy occ crm, plty to sb plty



WOB: 34.8klbs
RPM: 30
SPM: 197
SPP: 118psi

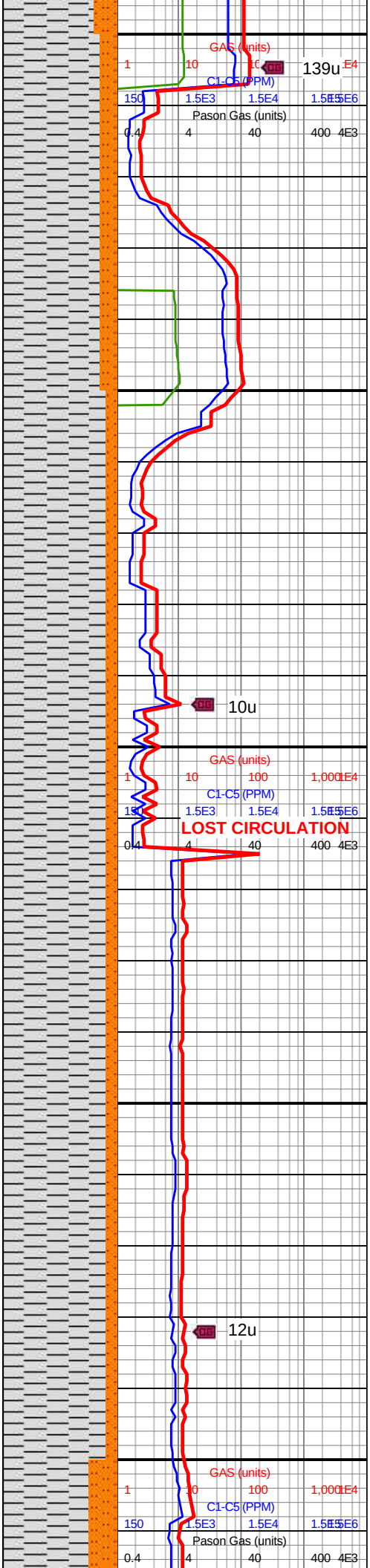
MD: 7,028'
INC: 10.2°
AZM: 180.2°
TVD: 6,982.35'
VS: -726.88'

MW IN: 10
VIS IN: 48
MW OUT: 10
VIS OUT: 45

MD: 7,117'
INC: 12.07°
AZM: 183.75°
TVD: 7,069.68'
VS: -709.71'

WOB: 18klbs
RPM: 3
SPM: 167
SPP: 2,770psi

MD: 7,206'
INC: 18.25°



non calc, sft to frm

7000-7050 85% SH: lt br to dk gy, fri to frm, non calc slty txt, fis plty to sb plty; 15% SLTST: gy to lt gy occ crm, plty to sb plty non calc, sft to frm

No water, samples washed in diesel

7050-7100 85% SH: lt br to dk gy, fri to frm, non calc slty txt, fis plty to sb plty; 15% SLTST: gy to lt gy occ crm, plty to sb plty non calc, sft to frm

7100-7150 90% SH: dk gy, med brn-gy, frm to hrd, sb blky-plty, non calc, rthy txt; 10% Sltst: lt gy-tn, lt gy occ crm, fri-frm, sb rnd-sb plty non calc

7150-7200 90% SH: dk gy, med brn-gy, frm to hrd, sb blky-plty, non calc, rthy txt; 10% Sltst: lt gy-tn, lt gy occ crm, fri-frm, sb rnd-sb plty non calc

AZM: 182.54°
TVD: 7,155.54'
VS: -686.48'

7,220
7,230
7,240
7,250
7,260

MW IN: 10
VIS IN: 47
MW OUT: 10
VIS OUT: 44

7,270
7,280
7,290

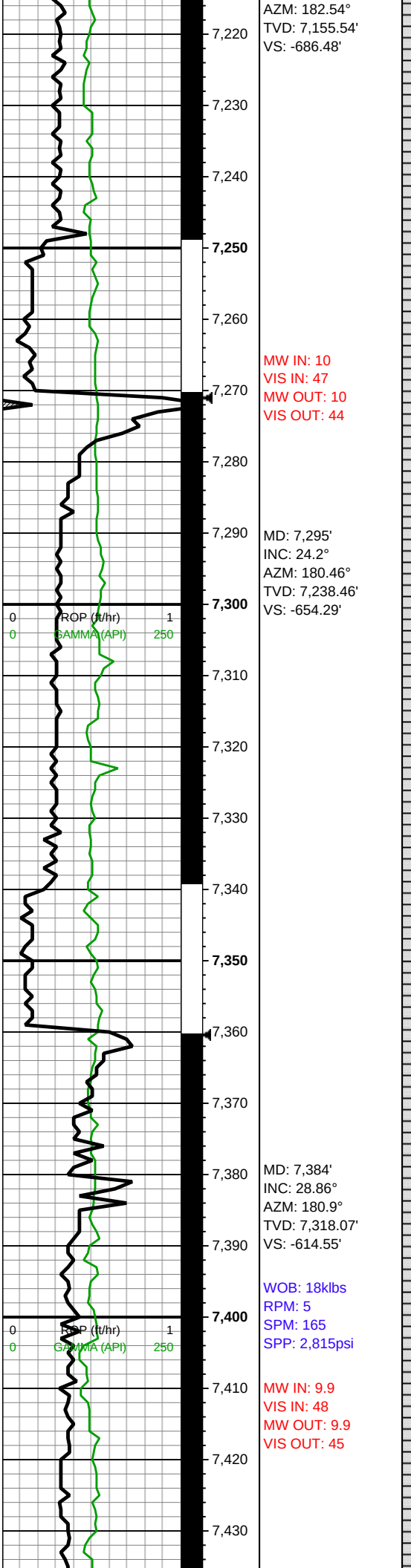
MD: 7,295'
INC: 24.2°
AZM: 180.46°
TVD: 7,238.46'
VS: -654.29'

7,300
7,310
7,320
7,330
7,340
7,350
7,360
7,370
7,380
7,390
7,400
7,410
7,420
7,430

MD: 7,384'
INC: 28.86°
AZM: 180.9°
TVD: 7,318.07'
VS: -614.55'

WOB: 18klbs
RPM: 5
SPM: 165
SPP: 2,815psi

MW IN: 9.9
VIS IN: 48
MW OUT: 9.9
VIS OUT: 45



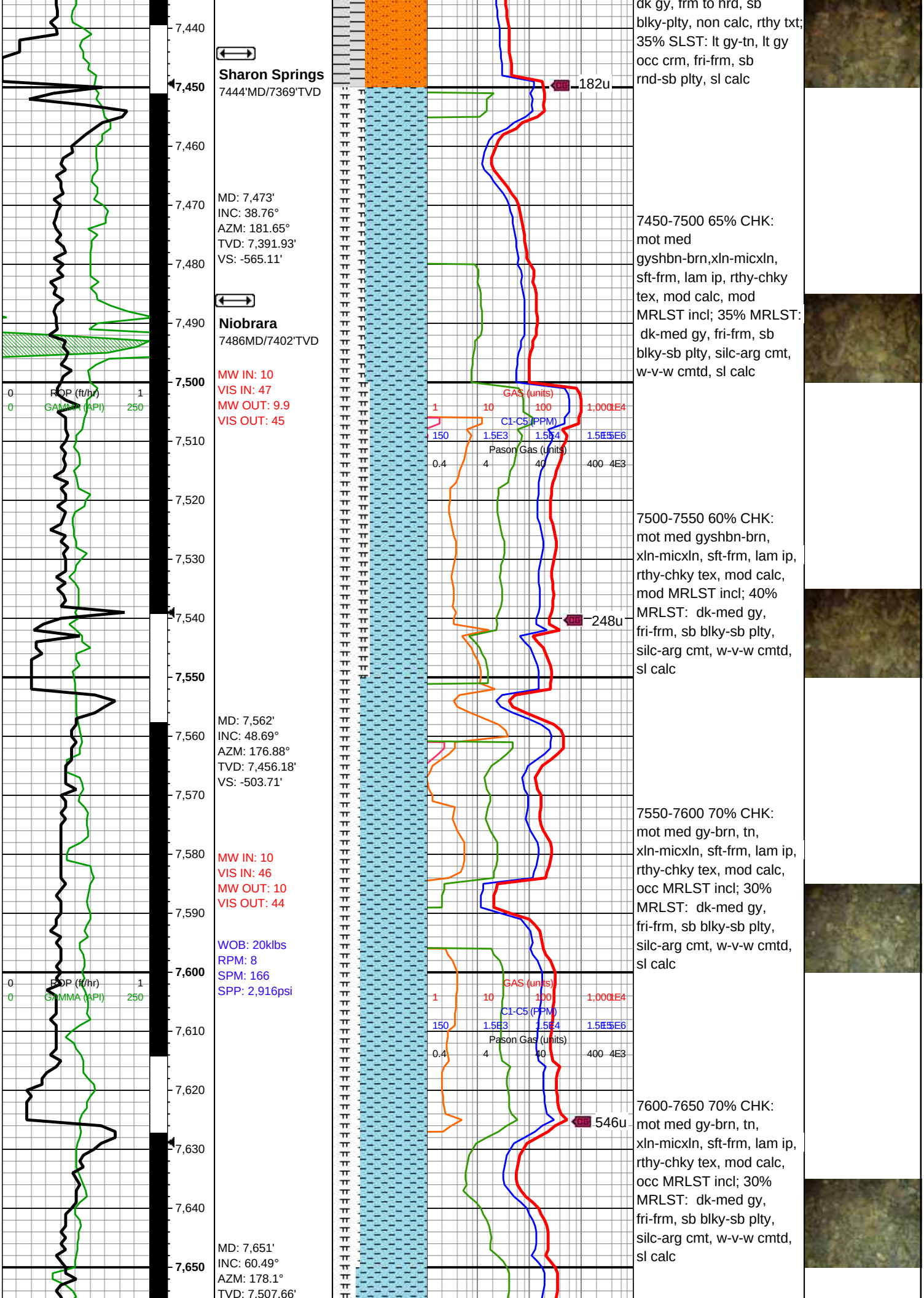
7200-7250 75% SH: lt gy, dk gy, med brn-gy, frm to hrd, sb blky-plty, non calc, rthy txt; 25% SLST: lt gy-tn, lt gy occ crm, fri-frm, sb rnd-sb plty non calc

7250-7300 75% SH: lt gy, dk gy, med brn-gy, frm to hrd, sb blky-plty, non calc, rthy txt; 25% SLST: lt gy-tn, lt gy occ crm, fri-frm, sb rnd-sb plty non calc

7300-7350 75% SH: lt gy, dk gy, med brn-gy, frm to hrd, sb blky-plty, non calc, rthy txt; 25% SLST: lt gy-tn, lt gy occ crm, fri-frm, sb rnd-sb plty non calc

7350-7400 65% SH: lt gy, dk gy, frm to hrd, sb blky-plty, non calc, rthy txt; 35% SLST: lt gy-tn, lt gy occ crm, fri-frm, sb rnd-sb plty, sl calc

7400-7450 65% SH: lt gy, dk gy,


7,440
7,450
7,460
7,470
7,480
7,490
7,500
7,510
7,520
7,530
7,540
7,550
7,560
7,570
7,580
7,590
7,600
7,610
7,620
7,630
7,640
7,650
Sharon Springs
7444'MD/7369'TVD
MD: 7,473'
INC: 38.76°
AZM: 181.65°
TVD: 7,391.93'
VS: -565.11'
Niobrara
7486MD/7402'TVD
MW IN: 10
VIS IN: 47
MW OUT: 9.9
VIS OUT: 45
MD: 7,562'
INC: 48.69°
AZM: 176.88°
TVD: 7,456.18'
VS: -503.71'
MW IN: 10
VIS IN: 46
MW OUT: 10
VIS OUT: 44
WOB: 20klbs
RPM: 8
SPM: 166
SPP: 2,916psi
MD: 7,651'
INC: 60.49°
AZM: 178.1°
TVD: 7,507.66'
0 ROP (ft/hr) 1
0 GAMMA (API) 250
GAS (units)
1 10 100 1,000 1E4
C1-C5 (PPM)
150 1.5E3 1.5E4 1.5E5 1.5E6
Pason Gas (units)
0.4 4 40 400 4E3
182u
248u
546u
dk gy, frm to hrd, sb blky-plty, non calc, rthy txt; 35% SLST: lt gy-tn, lt gy occ crm, fri-frm, sb rnd-sb plty, sl calc
7450-7500 65% CHK: mot med gyshbn-brn,xln-micxln, sft-frm, lam ip, rthy-chky tex, mod calc, mod MRLST incl; 35% MRLST: dk-med gy, fri-frm, sb blky-sb plty, silc-arg cmt, w-v-w cmtd, sl calc
7500-7550 60% CHK: mot med gyshbn-brn, xln-micxln, sft-frm, lam ip, rthy-chky tex, mod calc, mod MRLST incl; 40% MRLST: dk-med gy, fri-frm, sb blky-sb plty, silc-arg cmt, w-v-w cmtd, sl calc
7550-7600 70% CHK: mot med gy-brn, tn, xln-micxln, sft-frm, lam ip, rthy-chky tex, mod calc, occ MRLST incl; 30% MRLST: dk-med gy, fri-frm, sb blky-sb plty, silc-arg cmt, w-v-w cmtd, sl calc
7600-7650 70% CHK: mot med gy-brn, tn, xln-micxln, sft-frm, lam ip, rthy-chky tex, mod calc, occ MRLST incl; 30% MRLST: dk-med gy, fri-frm, sb blky-sb plty, silc-arg cmt, w-v-w cmtd, sl calc

VS: -431.36'

7,660
7,670
7,680

Niobrara B
7680MD/7522'TVD

MW IN: 10
VIS IN: 46
MW OUT: 10
VIS OUT: 44

7,690
7,700
7,710
7,720
7,730

MD: 7,740'
INC: 69.08°
AZM: 180.67°
TVD: 7,545.55'
VS: -350.93'

7,740
7,750
7,760
7,770
7,780
7,790

WOB: 37klbs
RPM: 29
SPM: 181
SPP: 3,680psi

7,800
7,810

MW IN: 10
VIS IN: 45
MW OUT: 10
VIS OUT: 43

7,820
7,830

MD: 7,830'
INC: 75.34°
AZM: 180.92°
TVD: 7,573.03'
VS: -265.29'

7,840
7,850
7,860
7,870

0 ROP (ft/hr) 1
0 GAMMA (API) 250

P

GAS (units)
1 10 100 1,000 1E4
C1-C5 (PPM)
150 1.5E3 1.5E4 1.5E5 1.5E6
Pason Gas (units)
0.4 4 40 400 4E3

917u

327u

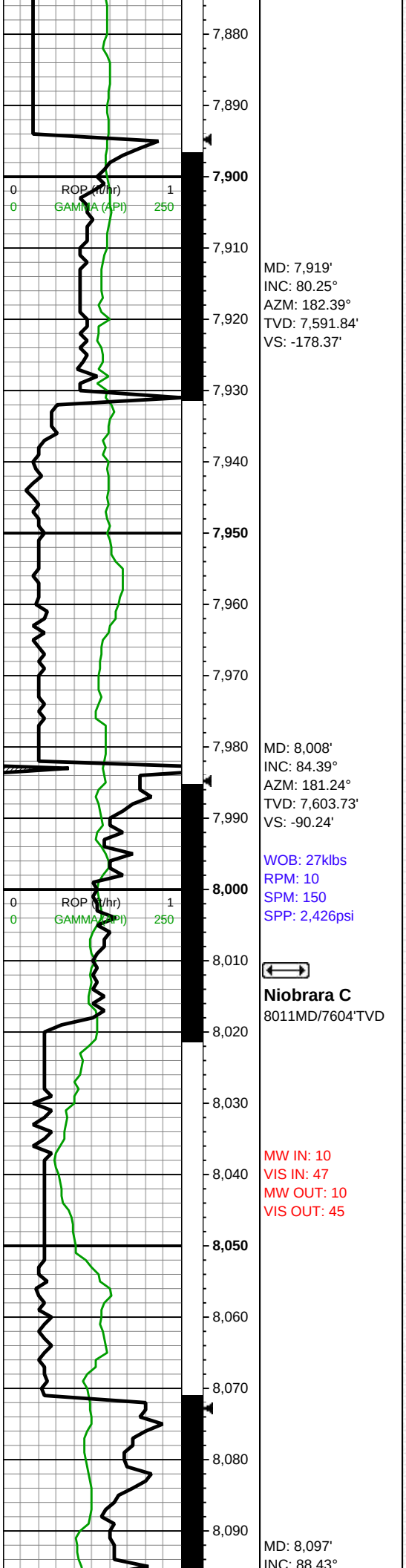
7650-7700 75% CHK: mot med gy-brn, tn, xln-micxln, sft-frm, lam ip, rthy-chky tex, mod calc, occ MRLST incl; 25% MRLST: dk-med gy, fri-frm, sb blky-sb plty, silc-arg cmt, w-v-w cmtd, v tr pp pyr, sl calc

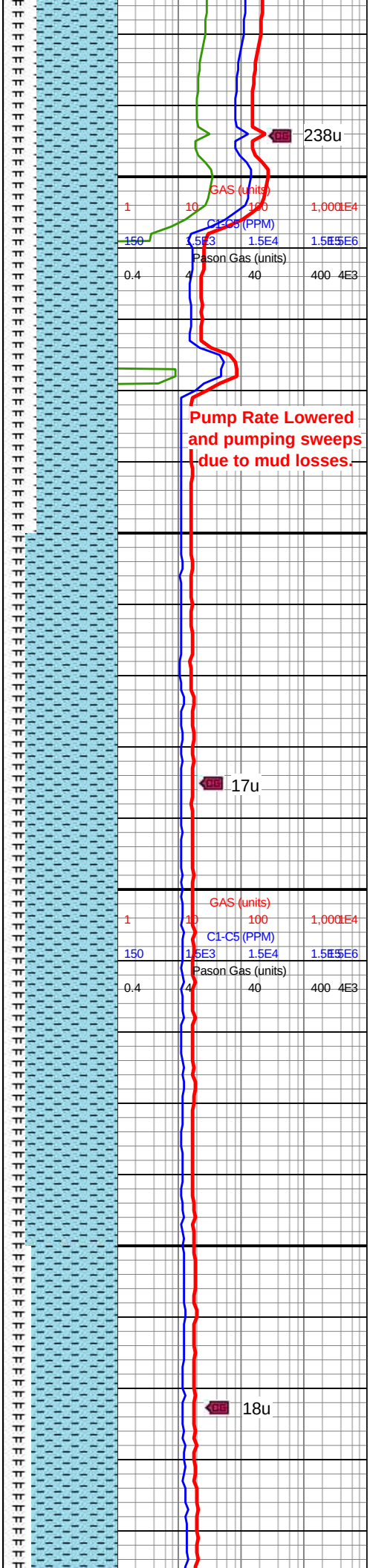
7700-7750 75% CHK: mot med gy-brn, tn, xln-micxln, sft-frm, lam ip, rthy-chky tex, mod calc, occ MRLST incl; 25% MRLST: dk-med gy, fri-frm, sb blky-sb plty, silc-arg cmt, w-v-w cmtd, v tr pp pyr, sl calc

7750-7800 70% CHK: mot med gy-brn, tn, xln-micxln, sft-frm, lam ip, rthy-chky tex, mod calc, occ MRLST incl; 30% MRLST: dk-med gy, fri-frm, sb blky-sb plty, silc-arg cmt, w-v-w cmtd, sl calc

7800-7850 65% CHK: mot med gy-brn, tn, xln-micxln, sft-frm, lam ip, rthy-chky tex, mod calc, occ MRLST incl; 45% MRLST: dk-med gy, fri-frm, sb blky-sb plty, silc-arg cmt, w-v-w cmtd, sl calc

7850-7900 70% CHK:





mot med gy-brn, tn, xln-micxln, sft-frm, lam ip, rthy-chky tex, mod calc, occ MRLST incl; 30% MRLST: dk-med gy, fri-frm, sb blky-sb plty, silc-arg cmt, w-v-w cmtd, sl calc

7900-7950 70% CHK: mot med gy-brn, tn, xln-micxln, sft-frm, lam ip, rthy-chky tex, mod calc, occ MRLST incl; 30% MRLST: dk-med gy, fri-frm, sb blky-sb plty, silc-arg cmt, w-v-w cmtd, sl calc

7950-8000 80% CHK: dk gy, mot med gy-brn, xln-micxln, sft-frm, lam ip, rthy-chky tex, mod calc, occ MRLST incl; 20% MRLST: dk-med gy, fri-frm, sb blky-sb plty, silc-arg cmt, w-v-w cmtd, sl calc

8000-8050 80% CHK: dk gy, mot med gy-brn, xln-micxln, sft-frm, lam ip, rthy-chky tex, mod calc, occ MRLST incl; 20% MRLST: dk-med gy, fri-frm, sb blky-sb plty, silc-arg cmt, w-v-w cmtd, sl calc

8050-8100 75% CHK: dk gy, mot med gy-brn, xln-micxln, sft-frm, lam ip, rthy-chky tex, mod calc, occ MRLST incl; 25% MRLST: dk-med gy, fri-frm, sb blky-sb plty, silc-arg cmt, w-cmtd, sl

AZM: 180.56°
TVD: 7,609.3'
VS: -1.45'

MW IN: 10
VIS IN: 47
MW OUT: 10
VIS OUT: 45

MD: 8,186'
INC: 88.03°
AZM: 179.52°
TVD: 7,612.05'
VS: 87.51'

WOB: 35klbs
RPM: 61
SPM: 152
SPP: 2,842psi

MW IN: 10
VIS IN: 47
MW OUT: 10
VIS OUT: 45

MD: 8,275'
INC: 89.05°
AZM: 180.85°
TVD: 7,614.32'
VS: 176.47'

ROP (ft/hr)
GAMMA (API)
GAS (units)
C1-C5 (PPM)
Pason Gas (units)

Pump Rate returned and end of sweeps

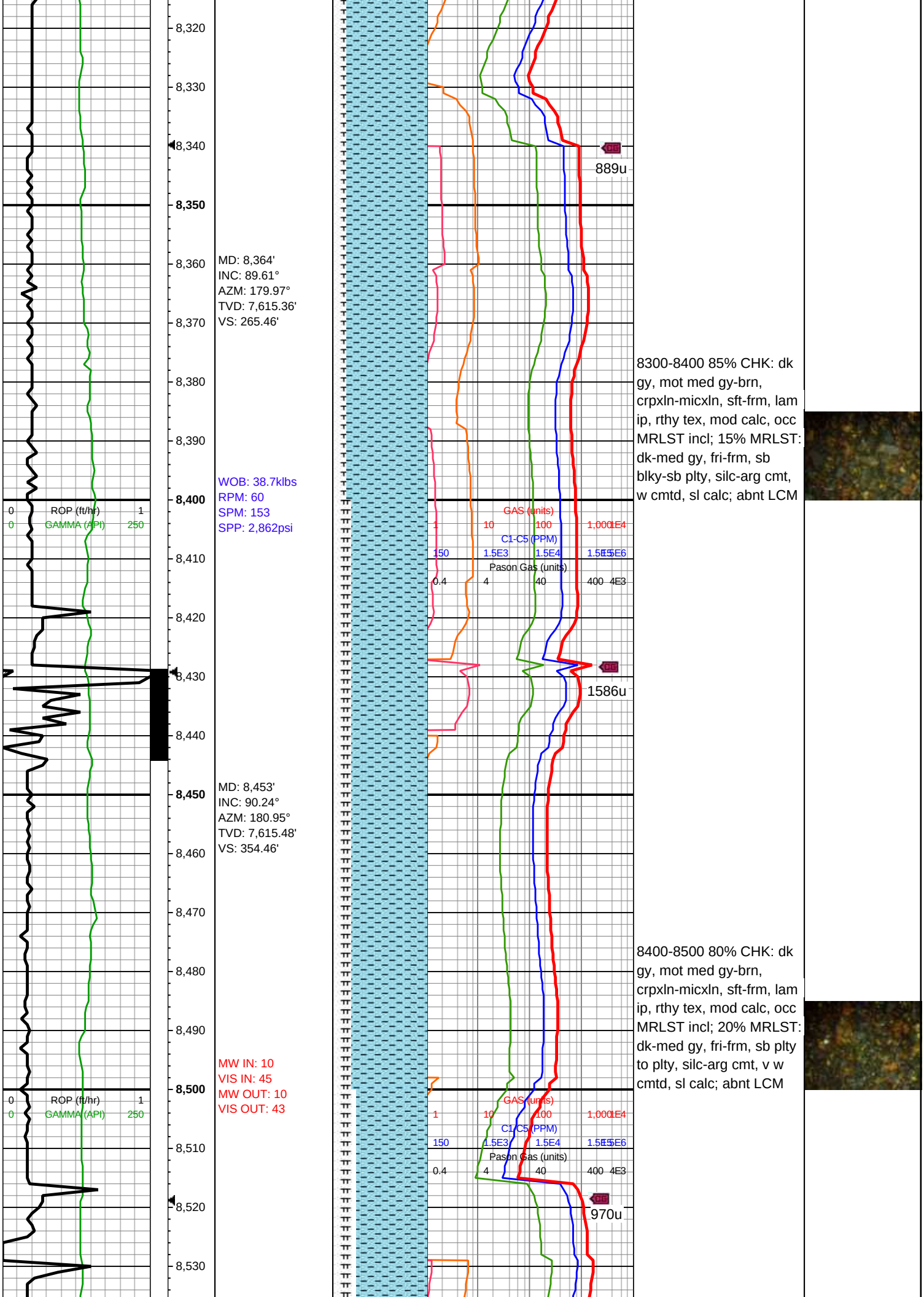
846u

1327u

calc

8100-8200 65% CHK: dk gy, mot med gy-brn, crpxln-micxln, sft-frm, lam ip, rthy tex, mod calc, occ MRLST incl; 35% MRLST: dk-med gy, fri-frm, sb blky-sb plty, silc-arg cmt, w cmtd, sl calc

8200-8300 70% CHK: dk gy, mot med gy-brn, crpxln-micxln, sft-frm, lam ip, rthy tex, mod calc, occ MRLST incl; 30% MRLST: dk-med gy, fri-frm, sb blky-sb plty, silc-arg cmt, w cmtd, sl calc



8300-8400 85% CHK: dk gy, mot med gy-brn, crpxln-micxln, sft-frm, lam ip, rthy tex, mod calc, occ MRLST incl; 15% MRLST: dk-med gy, fri-frm, sb blky-sb plty, silc-arg cmt, w cmtd, sl calc; abnt LCM

8400-8500 80% CHK: dk gy, mot med gy-brn, crpxln-micxln, sft-frm, lam ip, rthy tex, mod calc, occ MRLST incl; 20% MRLST: dk-med gy, fri-frm, sb plty to plty, silc-arg cmt, v w cmtd, sl calc; abnt LCM

MD: 8,542'
INC: 90.34°
AZM: 179.98°
TVD: 7,615.03'
VS: 443.45'

WOB: 37.1klbs
RPM: 60
SPM: 151
SPP: 3,007psi

MD: 8,631'
INC: 90.21°
AZM: 180.87°
TVD: 7,614.6'
VS: 532.44'

MW IN: 10
VIS IN: 45
MW OUT: 10
VIS OUT: 43

MD: 8,720'
INC: 89.38°
AZM: 180.06°
TVD: 7,614.92'
VS: 621.44'

8500-8600 75% CHK: dk gy, mot med gy-brn, crpxln-micxln, sft-frm, lam ip, rthy tex, mod calc, occ MRLST incl; 25% MRLST: dk-med gy, fri-frm, sb plty to plty, silc-arg cmt, v w cmtd, sl calc

8600-8700 65% CHK: dk gy, mot med gy-brn, crpxln-micxln, sft-frm, lam ip, rthy tex, mod calc, occ MRLST incl; 35% MRLST: dk-med gy, fri-frm, sb plty to plty, silc-arg cmt, v w cmtd, sl calc

8,760
8,770
8,780
8,790
8,800
8,810
8,820
8,830
8,840
8,850
8,860
8,870
8,880
8,890
8,900
8,910
8,920
8,930
8,940
8,950
8,960
8,970

0 ROP (ft/hr) 1
0 GAMMA (API) 250

WOB: 34.5klbs
RPM: 29
SPM: 151
SPP: 2,314psi

MD: 8,809'
INC: 88.87°
AZM: 181.5°
TVD: 7,616.28'
VS: 710.41'

MD: 8,899'
INC: 89.99°
AZM: 181.45°
TVD: 7,617.17'
VS: 800.37'

MW IN: 10
VIS IN: 45
MW OUT: 10
VIS OUT: 43

1350u

GAS (units)
1 10 100 1,000 1E4
C1-C5 (PPM)
150 1.5E3 1.5E4 1.5E5 1.5E6
Pason Gas (units)
0.4 4 40 400 4E3

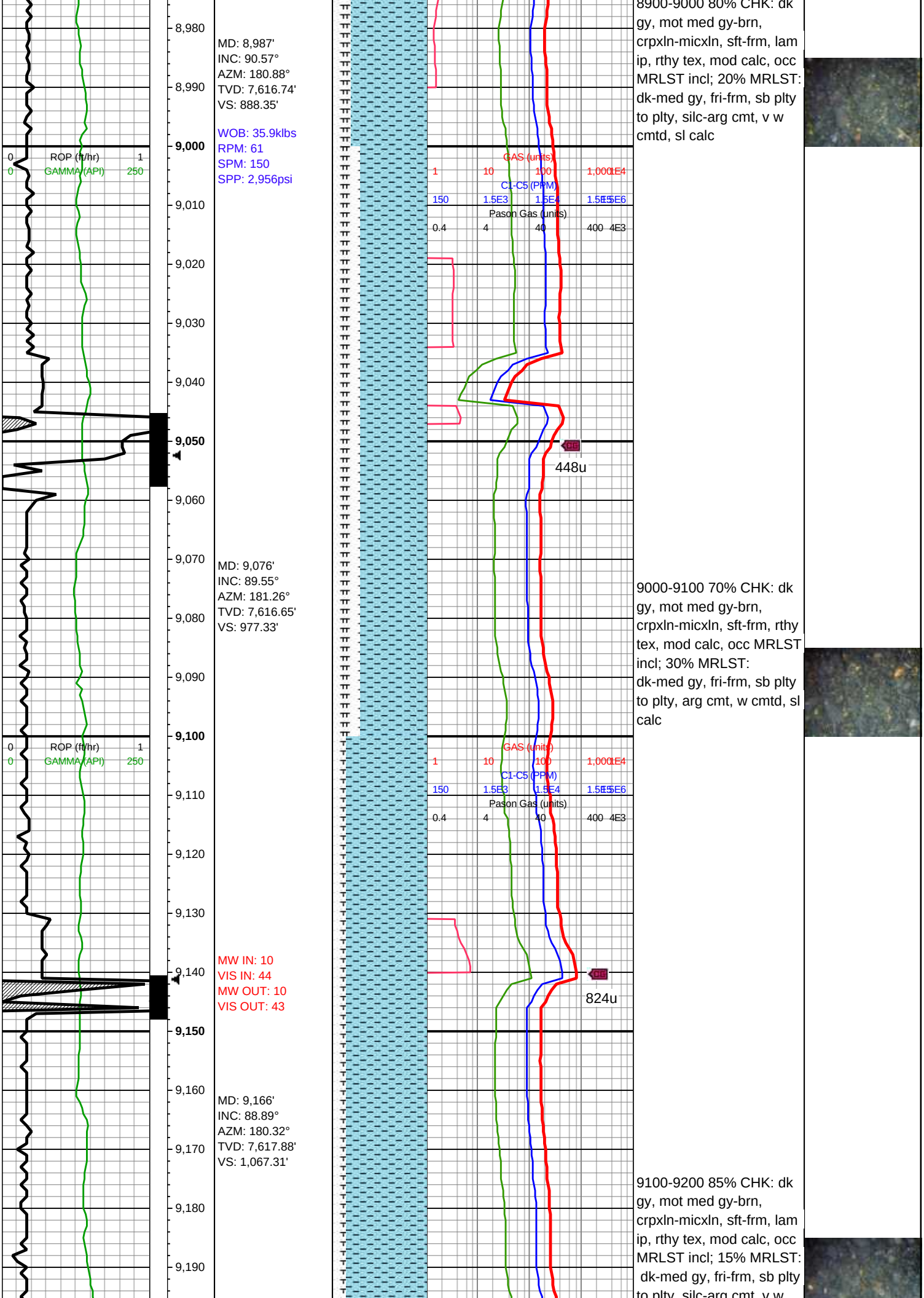
297u

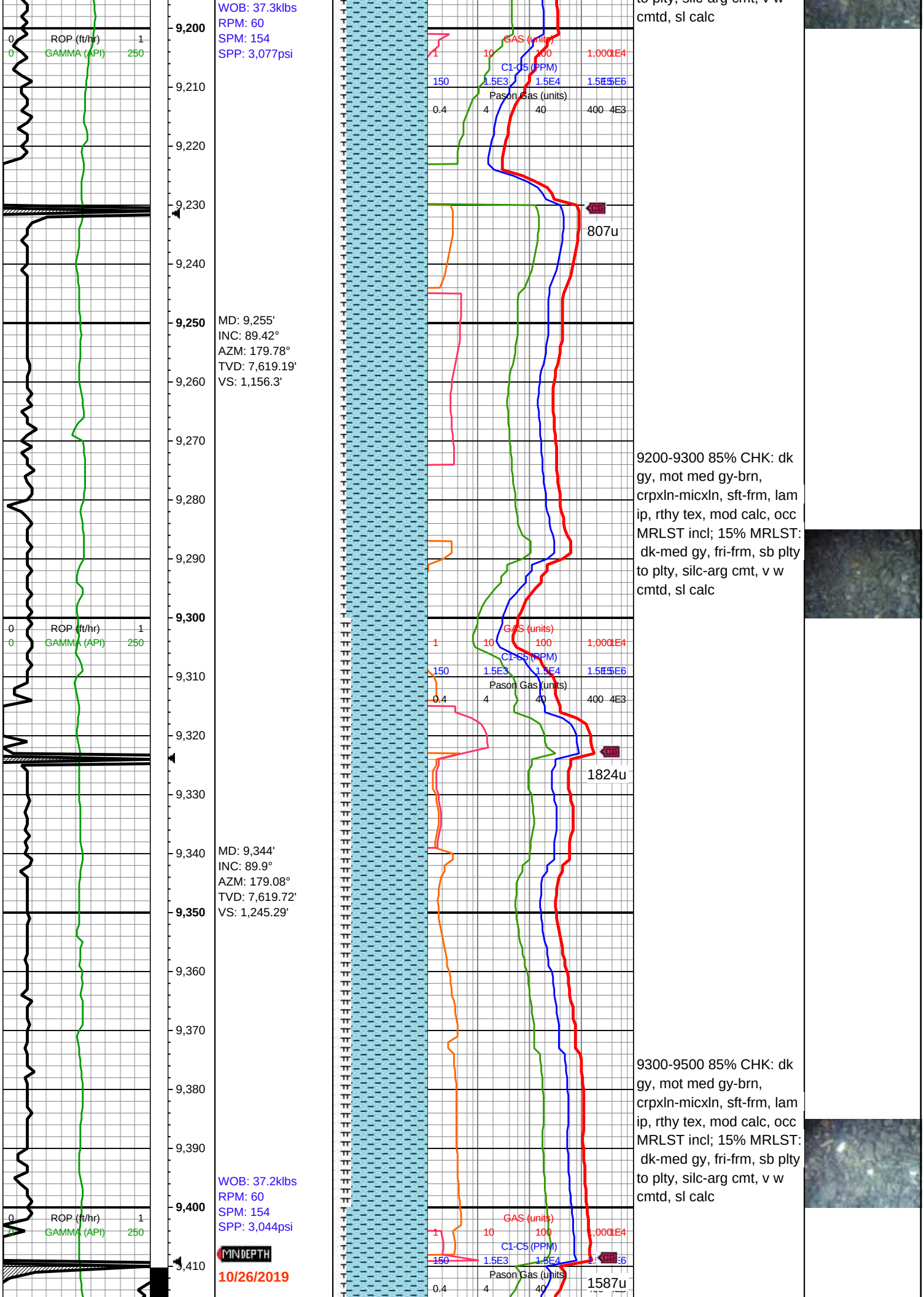
GAS (units)
1 10 100 1,000 1E4
C1-C5 (PPM)
150 1.5E3 1.5E4 1.5E5 1.5E6
Pason Gas (units)
0.4 4 40 400 4E3

303u

8700-8800 75% CHK: dk gy, mot med gy-brn, crpxln-micxln, sft-frm, lam ip, rthy tex, mod calc, occ MRLST incl; 25% MRLST: dk-med gy, fri-frm, sb plty to plty, silc-arg cmt, v w cmtd, sl calc

8800-8900 70% CHK: dk gy, mot med gy-brn, crpxln-micxln, sft-frm, lam ip, rthy tex, mod calc, occ MRLST incl; 30% MRLST: dk-med gy, fri-frm, sb plty to plty, silc-arg cmt, v w cmtd, sl calc; abnt LCM


8,980
8,990
9,000
9,010
9,020
9,030
9,040
9,050
9,060
9,070
9,080
9,090
9,100
9,110
9,120
9,130
9,140
9,150
9,160
9,170
9,180
9,190
0
ROP (ft/hr)
1
0
GAMMA (API)
250
GAS (units)
1
10
100
1,000
1E4
C1-C5 (PPM)
150
1.5E3
1.5E4
1.5E5
1.5E6
Pason Gas (units)
0.4
4
40
400
4E3
448u
824u
MD: 8,987'
INC: 90.57°
AZM: 180.88°
TVD: 7,616.74'
VS: 888.35'
WOB: 35.9klbs
RPM: 61
SPM: 150
SPP: 2,956psi
MD: 9,076'
INC: 89.55°
AZM: 181.26°
TVD: 7,616.65'
VS: 977.33'
MW IN: 10
VIS IN: 44
MW OUT: 10
VIS OUT: 43
MD: 9,166'
INC: 88.89°
AZM: 180.32°
TVD: 7,617.88'
VS: 1,067.31'
8900-9000 80% CHK: dk gy, mot med gy-brn, crpxln-micxln, sft-frm, lam ip, rthy tex, mod calc, occ MRLST incl; 20% MRLST: dk-med gy, fri-frm, sb plty to plty, silc-arg cmt, v w cmtd, sl calc
9000-9100 70% CHK: dk gy, mot med gy-brn, crpxln-micxln, sft-frm, rthy tex, mod calc, occ MRLST incl; 30% MRLST: dk-med gy, fri-frm, sb plty to plty, arg cmt, w cmtd, sl calc
9100-9200 85% CHK: dk gy, mot med gy-brn, crpxln-micxln, sft-frm, lam ip, rthy tex, mod calc, occ MRLST incl; 15% MRLST: dk-med gy, fri-frm, sb plty to plty, silc-arg cmt, v w


ROP (ft/hr)
GAMMA (API)
GAS (units)
C1-C5 (PPM)
Pason Gas (units)
9,200
9,210
9,220
9,230
9,240
9,250
9,260
9,270
9,280
9,290
9,300
9,310
9,320
9,330
9,340
9,350
9,360
9,370
9,380
9,390
9,400
9,410
WOB: 37.3klbs
RPM: 60
SPM: 154
SPP: 3,077psi
MD: 9,255'
INC: 89.42°
AZM: 179.78°
TVD: 7,619.19'
VS: 1,156.3'
MD: 9,344'
INC: 89.9°
AZM: 179.08°
TVD: 7,619.72'
VS: 1,245.29'
WOB: 37.2klbs
RPM: 60
SPM: 154
SPP: 3,044psi
MNDEPTH
10/26/2019
807u
1824u
1587u
cmtd, sl calc
9200-9300 85% CHK: dk gy, mot med gy-brn, crpxln-micxln, sft-frm, lam ip, rthy tex, mod calc, occ MRLST incl; 15% MRLST: dk-med gy, fri-frm, sb plty to plty, silc-arg cmt, v w cmtd, sl calc
9300-9500 85% CHK: dk gy, mot med gy-brn, crpxln-micxln, sft-frm, lam ip, rthy tex, mod calc, occ MRLST incl; 15% MRLST: dk-med gy, fri-frm, sb plty to plty, silc-arg cmt, v w cmtd, sl calc

MW IN: 10
VIS IN: 44
MW OUT: 10
VIS OUT: 42

MD: 9,433'
INC: 89.82°
AZM: 180.1°
TVD: 7,619.93'
VS: 1,334.29'

9,420
9,430
9,440
9,450
9,460
9,470
9,480
9,490
9,500

ROP (ft/hr) 0 1
GAMMA (API) 0 250

GAS (units) 1 10 100 1,000 1E4
C1-C5 (PPM) 150 1.5E3 1.5E4 1.5E5 1.5E6
Pason Gas (units) 0.4 4 40 400 4E3

440u

9400-9500 85% CHK: dk gy, mot med gy-brn, crpxln-micxln, sft-frm, lam ip, rthy tex, mod calc, occ MRLST incl; 15% MRLST: dk-med gy, fri-frm, sb plty to plty, silc-arg cmt, v w cmtd, calc

MW IN: 10
VIS IN: 44
MW OUT: 10
VIS OUT: 42

MD: 9,522'
INC: 88.85°
AZM: 180.7°
TVD: 7,620.97'
VS: 1,423.28'

9,510
9,520
9,530
9,540
9,550
9,560
9,570
9,580
9,590
9,600

WOB: 31.2klbs
RPM: 29
SPM: 166
SPP: 2,492psi

ROP (ft/hr) 0 1
GAMMA (API) 0 250

GAS (units) 1 10 100 1,000 1E4
C1-C5 (PPM) 150 1.5E3 1.5E4 1.5E5 1.5E6
Pason Gas (units) 0.4 4 40 400 4E3

962u

9500-9600 65% CHK: dk gy, mot med gy-brn, crpxln-micxln, sft-frm, lam ip, rthy tex, mod calc, occ MRLST incl; 35% MRLST: dk-med gy, fri-frm, sb plty to plty, silc-arg cmt, v w cmtd, calc

MD: 9,611'
INC: 88.52°
AZM: 181.07°
TVD: 7,623.01'
VS: 1,512.24'

9,610
9,620
9,630

9,640
9,650
9,660
9,670
9,680
9,690
9,700
9,710
9,720
9,730
9,740
9,750
9,760
9,770
9,780
9,790
9,800
9,810
9,820
9,830
9,840
9,850

MW IN: 10
VIS IN: 44
MW OUT: 10
VIS OUT: 42

MD: 9,700'
INC: 88.17°
AZM: 181.24°
TVD: 7,625.58'
VS: 1,601.18'

0 ROP (ft/hr) 1
0 GAMMA (API) 250

105u

GAS (units)
1 10 100 1,000 1E4
C1-C5 (PPM)
150 1.5E3 1.5E4 1.5E5 1.5E6
Pason Gas (units)
0.4 4 40 400 4E3

9600-9700 85% CHK: dk gy, mot med gy-brn, crpxln-micxln, sft-frm, lam ip, rthy tex, mod calc, occ MRLST incl; 15% MRLST: dk-med gy, fri-frm, sb plty to plty, silc-arg cmt, v w cmtd, calc

134u

MD: 9,789'
INC: 89.82°
AZM: 181.43°
TVD: 7,627.14'
VS: 1,690.13'

WOB: 33.9klbs
RPM: 60
SPM: 174
SPP: 3,572psi

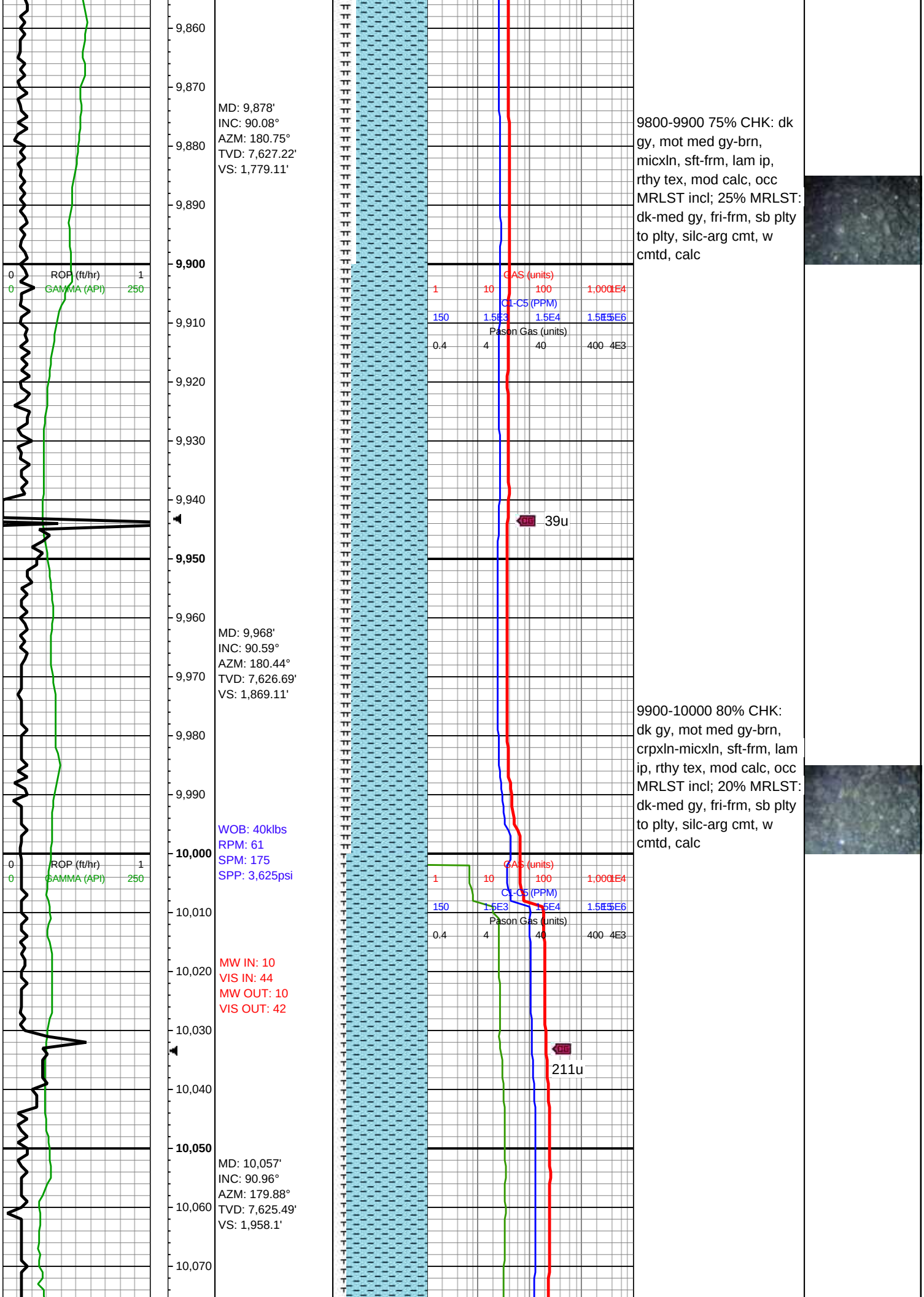
MW IN: 10
VIS IN: 44
MW OUT: 10
VIS OUT: 42

0 ROP (ft/hr) 1
0 GAMMA (API) 250

GAS (units)
1 10 100 1,000 1E4
C1-C5 (PPM)
150 1.5E3 1.5E4 1.5E5 1.5E6
Pason Gas (units)
0.4 4 40 400 4E3

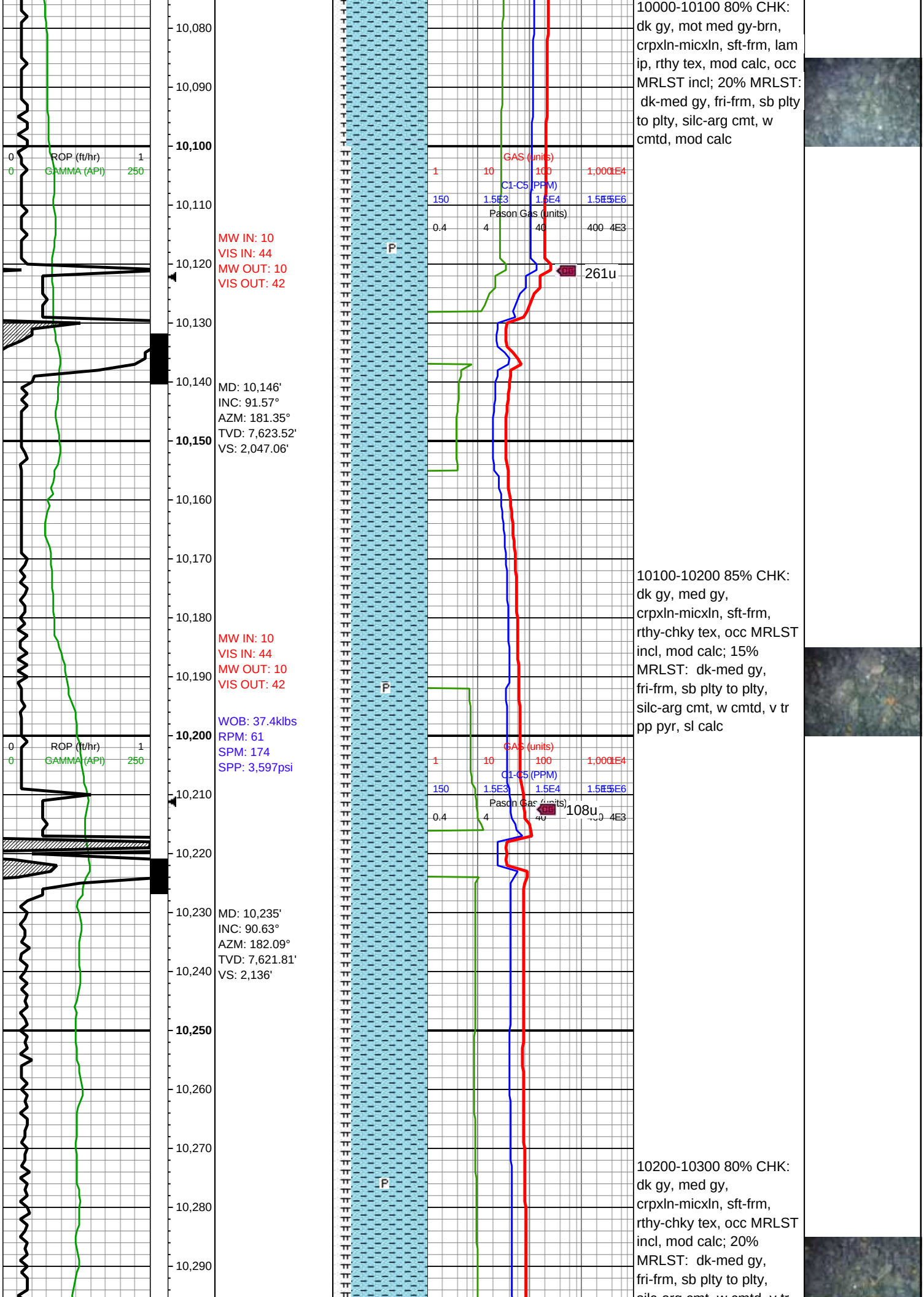
9700-9800 85% CHK: dk gy, mot med gy-brn, crpxln-micxln, sft-frm, lam ip, rthy tex, mod calc, occ MRLST incl; 15% MRLST: dk-med gy, fri-frm, sb plty to plty, silc-arg cmt, v w cmtd, calc

38u



9800-9900 75% CHK: dk gy, mot med gy-brn, micxln, sft-frm, lam ip, rthy tex, mod calc, occ MRLST incl; 25% MRLST: dk-med gy, fri-frm, sb plty to plty, silc-arg cmt, w cmtd, calc

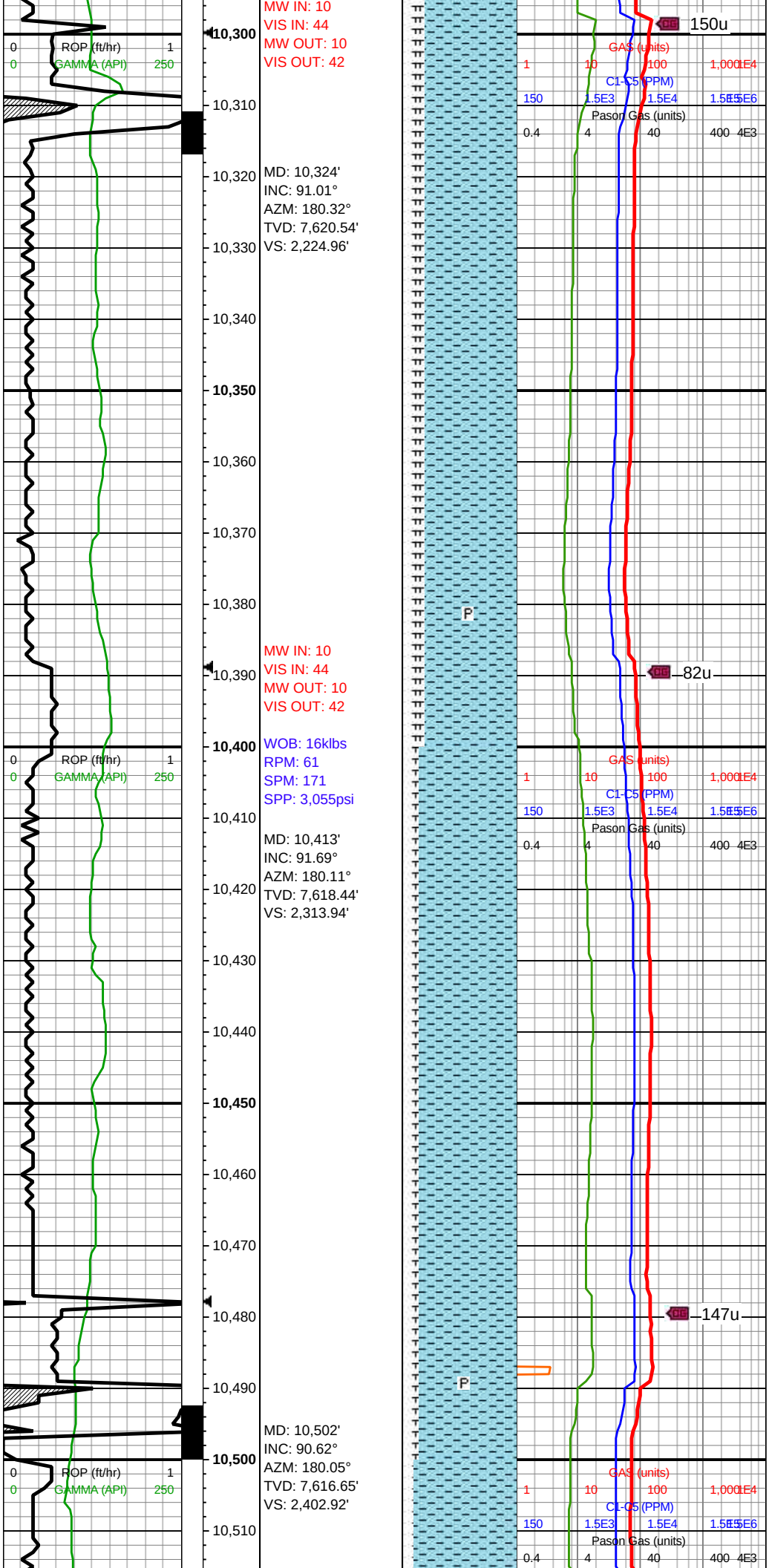
9900-10000 80% CHK: dk gy, mot med gy-brn, crpxln-micxln, sft-frm, lam ip, rthy tex, mod calc, occ MRLST incl; 20% MRLST: dk-med gy, fri-frm, sb plty to plty, silc-arg cmt, w cmtd, calc



10000-10100 80% CHK: dk gy, mot med gy-brn, crpxln-micxln, sft-frm, lam ip, rthy tex, mod calc, occ MRLST incl; 20% MRLST: dk-med gy, fri-frm, sb plty to plty, silc-arg cmt, w cmtd, mod calc

10100-10200 85% CHK: dk gy, med gy, crpxln-micxln, sft-frm, rthy-chky tex, occ MRLST incl, mod calc; 15% MRLST: dk-med gy, fri-frm, sb plty to plty, silc-arg cmt, w cmtd, v tr pp pyr, sl calc

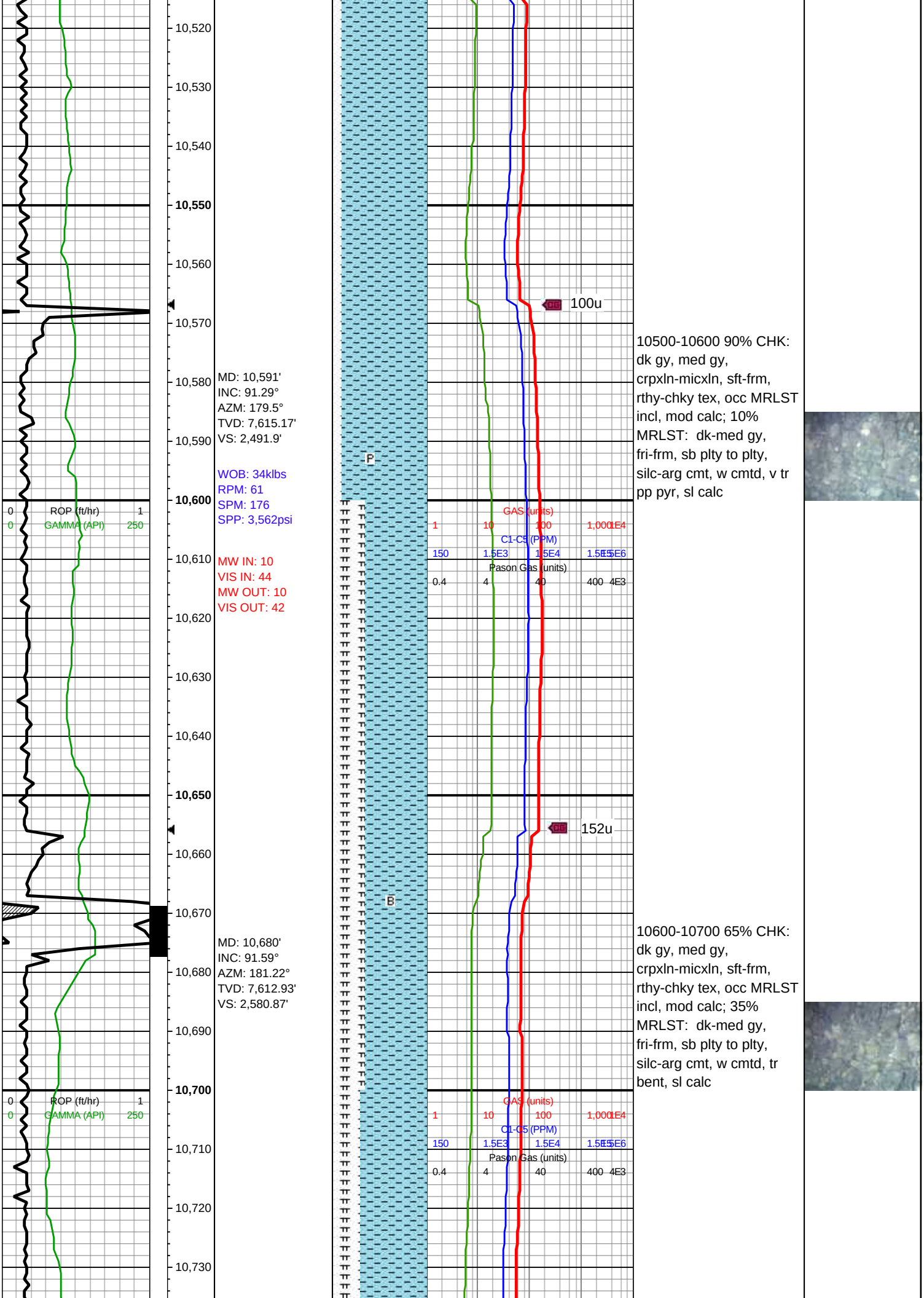
10200-10300 80% CHK: dk gy, med gy, crpxln-micxln, sft-frm, rthy-chky tex, occ MRLST incl, mod calc; 20% MRLST: dk-med gy, fri-frm, sb plty to plty,



silc-arg cmt, w cmtd, v tr pp pyr, sl calc

10300-10400 80% CHK: dk gy, med gy, crpxln-micxln, sft-frm, rthy-chky tex, occ MRLST incl, mod calc; 20% MRLST: dk-med gy, fri-frm, sb plty to plty, silc-arg cmt, w cmtd, v tr pp pyr, sl calc

10400-10500 85% CHK: dk gy, med gy, crpxln-micxln, sft-frm, rthy-chky tex, occ MRLST incl, mod calc; 15% MRLST: dk-med gy, fri-frm, sb plty to plty, silc-arg cmt, w cmtd, v tr pp pyr, sl calc



10500-10600 90% CHK: dk gy, med gy, crpxln-micxln, sft-frm, rthy-chky tex, occ MRLST incl, mod calc; 10% MRLST: dk-med gy, fri-frm, sb plty to plty, silc-arg cmt, w cmtd, v tr pp pyr, sl calc

10600-10700 65% CHK: dk gy, med gy, crpxln-micxln, sft-frm, rthy-chky tex, occ MRLST incl, mod calc; 35% MRLST: dk-med gy, fri-frm, sb plty to plty, silc-arg cmt, w cmtd, tr bent, sl calc

10,740
10,750
10,760
10,770
10,780
10,790
10,800
10,810
10,820
10,830
10,840
10,850
10,860
10,870
10,880
10,890
10,900
10,910
10,920
10,930
10,940
10,950

MD: 10,769'
INC: 92.23°
AZM: 180.64°
TVD: 7,609.96'
VS: 2,669.8'

WOB: 36klbs
RPM: 61
SPM: 174
SPP: 3,665psi

MD: 10,858'
INC: 91.1°
AZM: 181.89°
TVD: 7,607.38'
VS: 2,758.74'

MD: 10,947'
INC: 91.22°
AZM: 182.95°
TVD: 7,605.58'
VS: 2,847.63'

0 ROP (ft/hr) 1
0 GAMMA (API) 250

B

78u

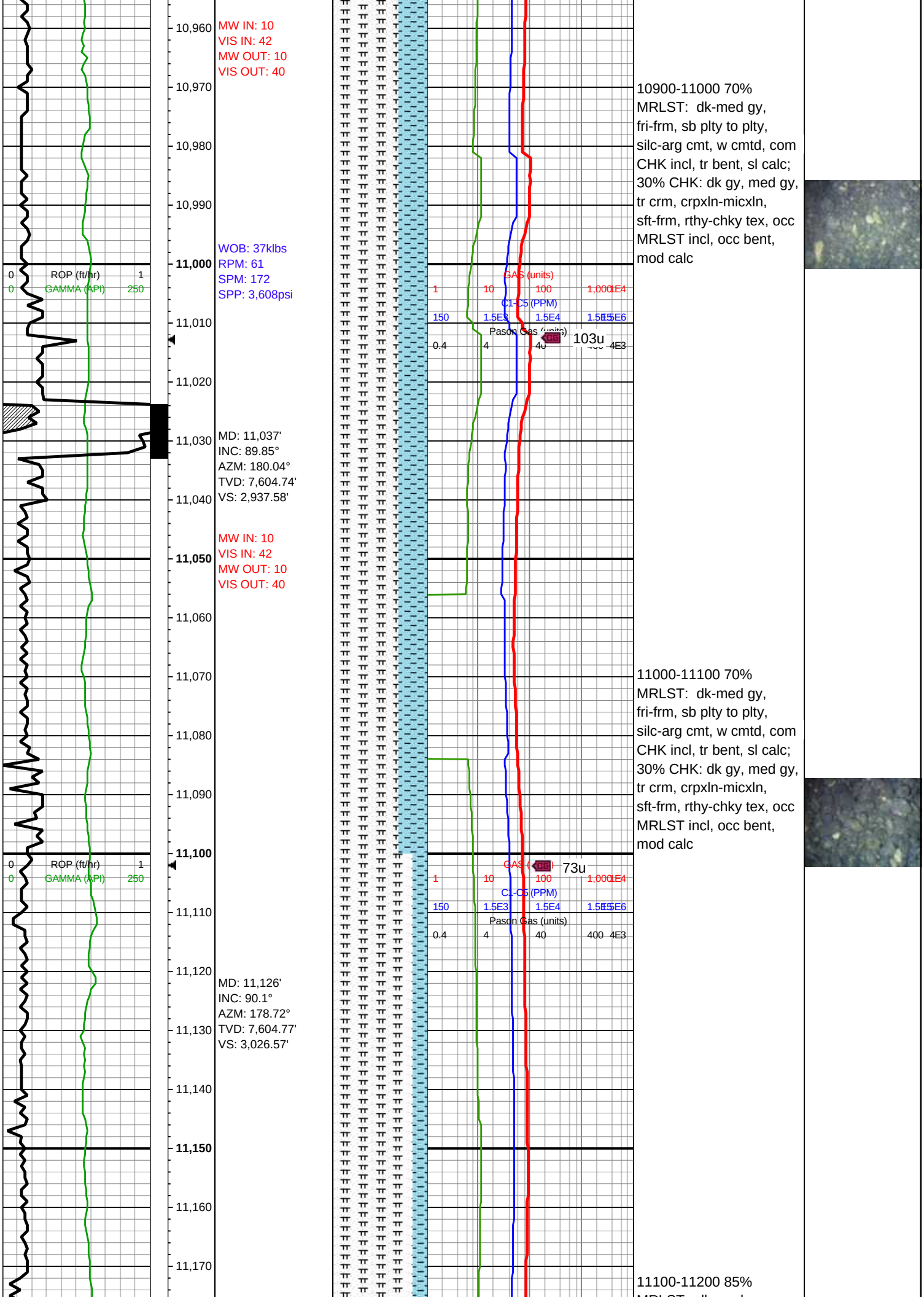
151u

74u

GAS (units)
1 10 100 1,000 1E4
C1-C5 (PPM)
150 1.5E3 1.5E4 1.5E5 1E6
Pason Gas (units)
0.4 4 40 400 4E3

10700-10800 70% CHK: dk gy, med gy, crpxln-micxln, sft-frm, rthy-chky tex, occ MRLST incl, mod calc; 30% MRLST: dk-med gy, fri-frm, sb plty to plty, silc-arg cmt, w cmtd, com chk incl, tr bent, sl calc

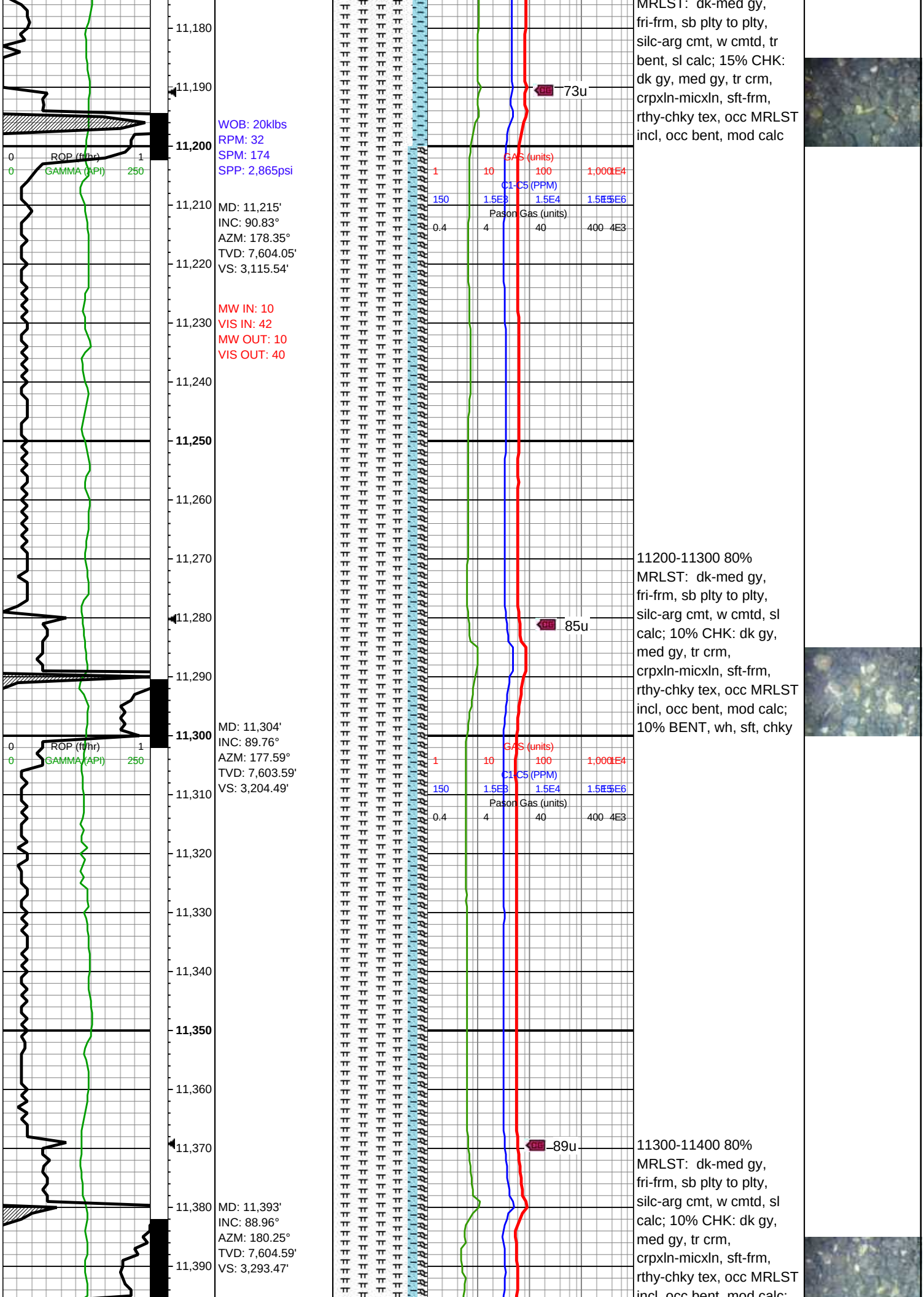
10800-10900 70% MRLST: dk-med gy, fri-frm, sb plty to plty, silc-arg cmt, w cmtd, com CHK incl, tr bent, sl calc; 30% CHK: dk gy, med gy, tr crm, crpxln-micxln, sft-frm, rthy-chky tex, occ MRLST incl, occ bent, mod calc

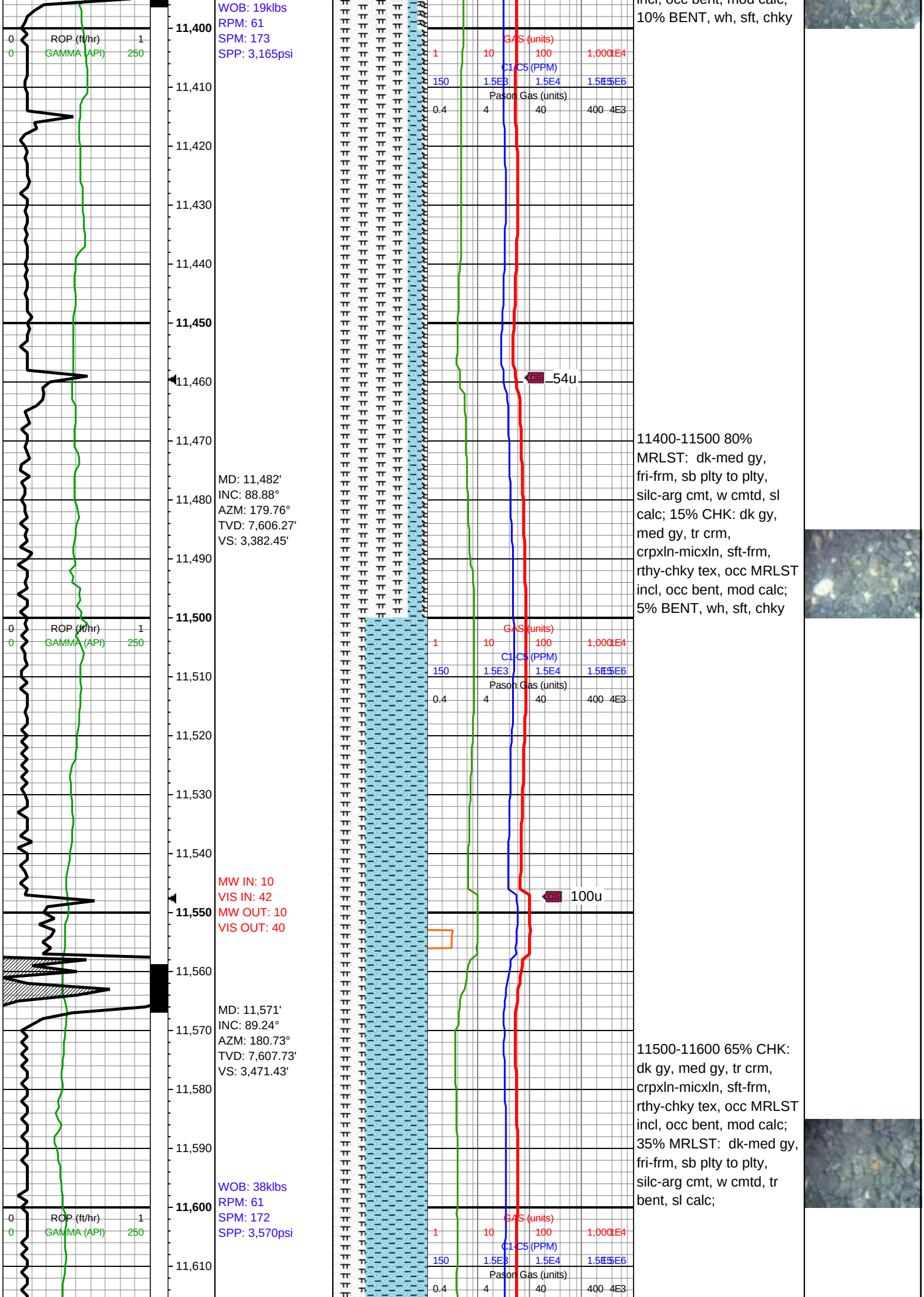


10900-11000 70% MRLST: dk-med gy, fri-frm, sb plty to plty, silc-arg cmt, w cmtd, com CHK incl, tr bent, sl calc; 30% CHK: dk gy, med gy, tr crm, crpxln-micxln, sft-frm, rthy-chky tex, occ MRLST incl, occ bent, mod calc

11000-11100 70% MRLST: dk-med gy, fri-frm, sb plty to plty, silc-arg cmt, w cmtd, com CHK incl, tr bent, sl calc; 30% CHK: dk gy, med gy, tr crm, crpxln-micxln, sft-frm, rthy-chky tex, occ MRLST incl, occ bent, mod calc

11100-11200 85%


11,180
11,190
11,200
11,210
11,220
11,230
11,240
11,250
11,260
11,270
11,280
11,290
11,300
11,310
11,320
11,330
11,340
11,350
11,360
11,370
11,380
11,390
0 ROP (ft/hr) 1
0 GAMMA (API) 250
WOB: 20klbs
RPM: 32
SPM: 174
SPP: 2,865psi
MD: 11,215'
INC: 90.83°
AZM: 178.35°
TVD: 7,604.05'
VS: 3,115.54'
MW IN: 10
VIS IN: 42
MW OUT: 10
VIS OUT: 40
MD: 11,304'
INC: 89.76°
AZM: 177.59°
TVD: 7,603.59'
VS: 3,204.49'
MD: 11,393'
INC: 88.96°
AZM: 180.25°
TVD: 7,604.59'
VS: 3,293.47'
GAS (units)
1 10 100 1,000 1E4
C1-C5 (PPM)
150 1.5E3 1.5E4 1.5E5 1.5E6
Pason Gas (units)
0.4 4 40 400 4E3
DE 73u
DE 85u
DE 89u
MRLST: dk-med gy, fri-frm, sb plty to plty, silc-arg cmt, w cmtd, tr bent, sl calc; 15% CHK: dk gy, med gy, tr crm, crpxln-micxln, sft-frm, rthy-chky tex, occ MRLST incl, occ bent, mod calc
11200-11300 80% MRLST: dk-med gy, fri-frm, sb plty to plty, silc-arg cmt, w cmtd, sl calc; 10% CHK: dk gy, med gy, tr crm, crpxln-micxln, sft-frm, rthy-chky tex, occ MRLST incl, occ bent, mod calc; 10% BENT, wh, sft, chky
11300-11400 80% MRLST: dk-med gy, fri-frm, sb plty to plty, silc-arg cmt, w cmtd, sl calc; 10% CHK: dk gy, med gy, tr crm, crpxln-micxln, sft-frm, rthy-chky tex, occ MRLST incl, occ bent, mod calc;



10% BENT, wh, sft, chky

11400-11500 80% MRLST: dk-med gy, fri-frm, sb plty to plty, silc-arg cmt, w cmtd, sl calc; 15% CHK: dk gy, med gy, tr crm, crpxln-micxln, sft-frm, rthy-chky tex, occ MRLST incl, occ bent, mod calc; 5% BENT, wh, sft, chky

11500-11600 65% CHK: dk gy, med gy, tr crm, crpxln-micxln, sft-frm, rthy-chky tex, occ MRLST incl, occ bent, mod calc; 35% MRLST: dk-med gy, fri-frm, sb plty to plty, silc-arg cmt, w cmtd, tr bent, sl calc;

11,620
11,630
11,640
11,650
11,660
11,670
11,680
11,690
11,700
11,710
11,720
11,730
11,740
11,750
11,760
11,770
11,780
11,790
11,800
11,810
11,820
11,830

0 ROP (ft/hr) 1
0 GAMMA (API) 250

MD: 11,660'
INC: 90.27°
AZM: 183.82°
TVD: 7,608.11'
VS: 3,560.34'

MW IN: 10
VIS IN: 42
MW OUT: 10
VIS OUT: 40

MW IN: 10
VIS IN: 42
MW OUT: 10
VIS OUT: 40

MD: 11,749'
INC: 90.82°
AZM: 182.77°
TVD: 7,607.26'
VS: 3,649.18'

WOB: 39.5klbs
RPM: 61
SPM: 176
SPP: 3,637psi

MD: 11,838'
INC: 92.6°

93u

GAS (units)
1 10 100 1,000 1E4
C1-C5 (PPM)
150 1.5E3 1.5E4 1.5E5 1.5E6
Pason Gas (units)
0.4 4 40 400 4E3

60u

GAS (units)
1 10 100 1,000 1E4
C1-C5 (PPM)
150 1.5E3 1.5E4 1.5E5 1.5E6
Pason Gas (units)
0.4 4 40 400 4E3

51u

11600-11700 65% CHK: dk gy, med gy, tr crm, crpxln-micxln, sft-frm, rthy-chky tex, occ MRLST incl, occ bent, mod calc; 35% MRLST: dk-med gy, fri-frm, sb plty to plty, silc-arg cmt, w cmtd, tr bent, sl calc

11700-11800 70% CHK: dk gy, med gy, tr crm, micxln, sft-frm, rthy-chky tex, occ MRLST incl, occ bent, mod calc; 30% MRLST: dk-med gy, fri-frm, sb plty to plty, silc-arg cmt, w cmtd, tr bent, calc

AZM: 181.99°
TVD: 7,604.6'
VS: 3,738.05'

MW IN: 10
VIS IN: 42
MW OUT: 10
VIS OUT: 40

MD: 11,927'
INC: 91.38°
AZM: 181.45°
TVD: 7,601.51'
VS: 3,826.95'

WOB: 24.1klbs
RPM: 61
SPM: 172
SPP: 3,215psi

MD: 12,017'
INC: 91.22°
AZM: 182.07°
TVD: 7,599.47'
VS: 3,916.88'

11,840
11,850
11,860
11,870
11,880
11,890
11,900
11,910
11,920
11,930
11,940
11,950
11,960
11,970
11,980
11,990
12,000
12,010
12,020
12,030
12,040
12,050

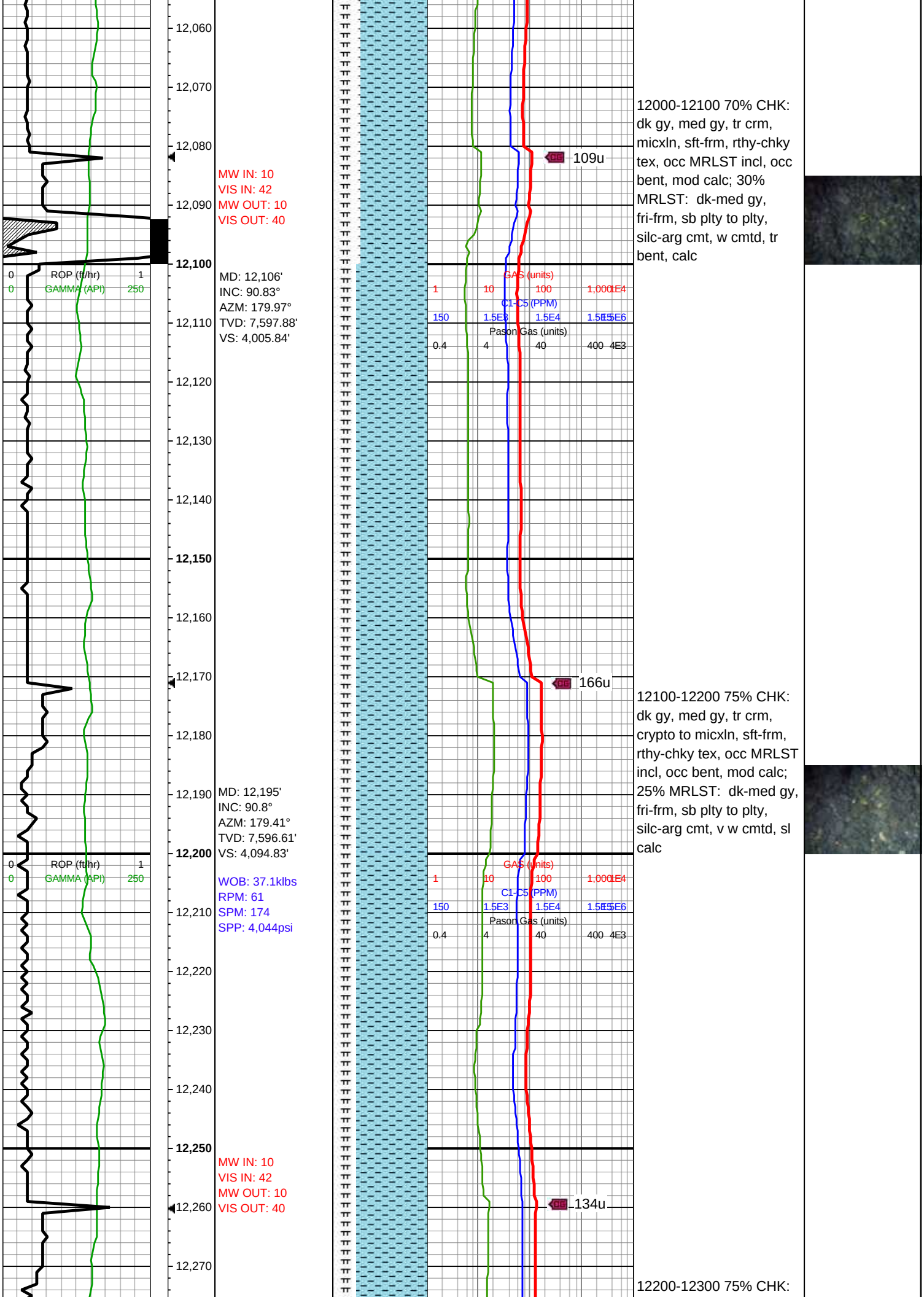
0 ROP (ft/hr) 1
0 GAMMA (API) 250

GAS (units)
1 10 100 1,000 1E4
61u
C1-C5 (PPM)
150 1.5E3 1.5E4 1.5E5 1E6
Pason Gas (units)
0.4 4 40 400 4E3

11800-11900 65% CHK: dk gy, med gy, tr crm, micxln, sft-frm, rthy-chky tex, occ MRLST incl, occ bent, mod calc; 35% MRLST: dk-med gy, fri-frm, sb plty to plty, silc-arg cmt, w cmtd, tr bent, calc

74u

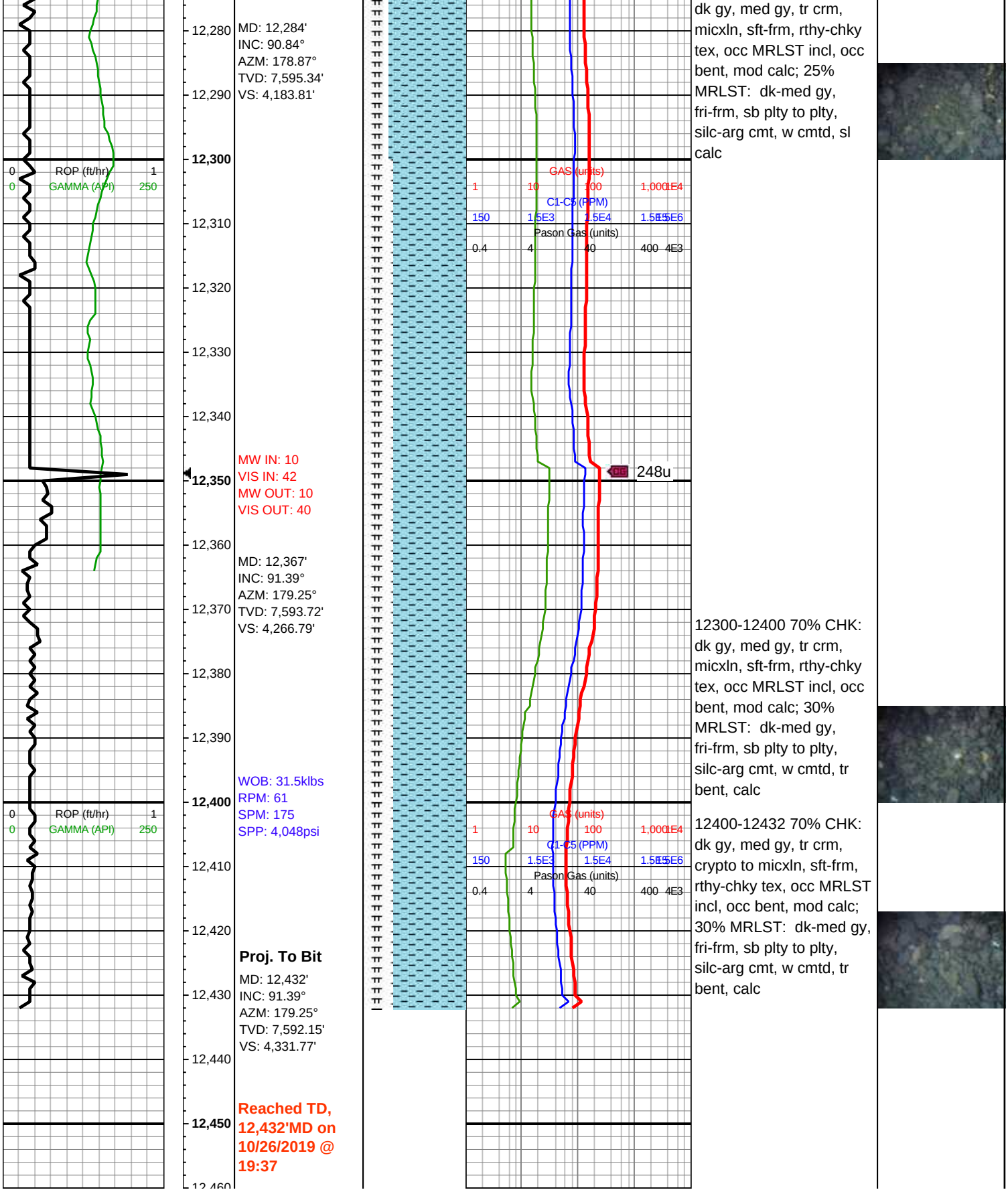
11900-12000 65% CHK: dk gy, med gy, tr crm, micxln, sft-frm, rthy-chky tex, occ MRLST incl, occ bent, mod calc; 35% MRLST: dk-med gy, fri-frm, sb plty to plty, silc-arg cmt, w cmtd, sl calc



12000-12100 70% CHK: dk gy, med gy, tr crm, micxln, sft-frm, rthy-chky tex, occ MRLST incl, occ bent, mod calc; 30% MRLST: dk-med gy, fri-frm, sb plty to plty, silc-arg cmt, w cmtd, tr bent, calc

12100-12200 75% CHK: dk gy, med gy, tr crm, crypto to micxln, sft-frm, rthy-chky tex, occ MRLST incl, occ bent, mod calc; 25% MRLST: dk-med gy, fri-frm, sb plty to plty, silc-arg cmt, v w cmtd, sl calc

12200-12300 75% CHK:



MD: 12,284'
INC: 90.84°
AZM: 178.87°
TVD: 7,595.34'
VS: 4,183.81'

MW IN: 10
VIS IN: 42
MW OUT: 10
VIS OUT: 40

MD: 12,367'
INC: 91.39°
AZM: 179.25°
TVD: 7,593.72'
VS: 4,266.79'

WOB: 31.5klbs
RPM: 61
SPM: 175
SPP: 4,048psi

Proj. To Bit
MD: 12,432'
INC: 91.39°
AZM: 179.25°
TVD: 7,592.15'
VS: 4,331.77'

Reached TD, 12,432'MD on 10/26/2019 @ 19:37

dk gy, med gy, tr crm, micxln, sft-frm, rthy-chky tex, occ MRLST incl, occ bent, mod calc; 25% MRLST: dk-med gy, fri-frm, sb plty to plty, silc-arg cmt, w cmtd, sl calc

12300-12400 70% CHK: dk gy, med gy, tr crm, micxln, sft-frm, rthy-chky tex, occ MRLST incl, occ bent, mod calc; 30% MRLST: dk-med gy, fri-frm, sb plty to plty, silc-arg cmt, w cmtd, tr bent, calc

12400-12432 70% CHK: dk gy, med gy, tr crm, crypto to micxln, sft-frm, rthy-chky tex, occ MRLST incl, occ bent, mod calc; 30% MRLST: dk-med gy, fri-frm, sb plty to plty, silc-arg cmt, w cmtd, tr bent, calc