



# RESERVOIR GROUP

Scale: 5" / 100'  
Measured Depth Log

**Well Name** Sam 3O-25H-M166

**Location** Sec. 25 T1N R66W

**State** Colorado

**County** Weld

**Country** USA

**Rig Number** Ensign 140

**API Number** 05123461330000

**AFE #** 16190879

**Geographic Region** Rockies

**Field** Wattenberg

**Spud Date** 9/22/2018

**Drilling Completed** 9/25/2018

**Surface Coordinates** Lat/Long: 40.01851/-104.733857  
SHL: Sec. 25 T1N R66W  
Footage: 1273 FSL 309 FWL

**Bottom Hole Coordinates** Proposed BHL: Sec. 25 T1N R66W  
Footages: 25 FFSLL 460 FFELL

**Ground Elevation** 5,086'

**K.B. Elevation** 5,109'

**Logged Interval** 6,700' **To** 11,892'

**Total Depth** 11,892'

**Formation** B Chalk

**Type of Drilling Fluid** Synthetic Oil Based Mud

## Operator

**Company** Crestone Peak Resources

**Address** 1801 California Street, Suite 2500  
Denver, CO 80202



CRESTONE PEAK

# CRESTONE PEAK RESOURCES

## Geologist

**Name** John Ready

**Company** Crestone Peak Resources

**Address** 1801 California Street, Suite 2500  
Denver, CO 80202

## Zone Color Coding

Oil	Condensate	Gas
Note	Core	Pressure
Error	Water	Seal

## Other

**Loggers:** Nicholas Watkins / Thomas Yull

**Services Provided:** 2-Man Mudlogging / Geosteering

**Equipment:** ML-522

**Contractor:** Empirica, Reservoir Group  
6360 West Sam Houston Pkwy N  
Houston, TX 77041

**Service Start Date:** 9/23/2018

**Service Release Date:** 9/26/2018

## 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

## Accessories

### Fossils

	ALGAE
	AMPHIPORA
	BELEMNITE
	BIOCLASTIC
	BRACHIOPOD
	BRYOZOA
	CEPHALOPOD
	CORAL
	CRINOID
	ECHINOID
	FISH
	FORAMINIFERA

### Fossil

	GASTROPOD
	OOLITE
	OSTRACOD
	PELECYPOD
	PELLET
	PISOLITE
	PLANT REMAINS
	PLANT SPORES
	SCAPHOPOD
	STROMATOPOROID

### Minerals

	ANHYDRITIC
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### Argillaceous

	ARGILLITE GRAIN
	BENTONITE
	BITUMENOUS SUBSTANCE
	BRECCIA FRAGMENTS
	CALCAREOUS
	CARBONACEOUS FLAKES
	CHTDL
	CHTLT
	COAL - THIN BEDS
	DOLOMITIC
	FELDSPAR
	FERRUGINOUS PELLET
	FERRUGINOUS

### Glauconite

	GYPSIFEROUS
	HEAVY MINERAL
	KAOLIN
	MARLSTONE
	MINERAL CRYSTALS
	NODULES
	PHOSPHATE PELLETS
	PYRITE
	SALT CAST
	SANDY
	SILICEOUS
	SILTY
	TUFFACEOUS

### Stringer

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

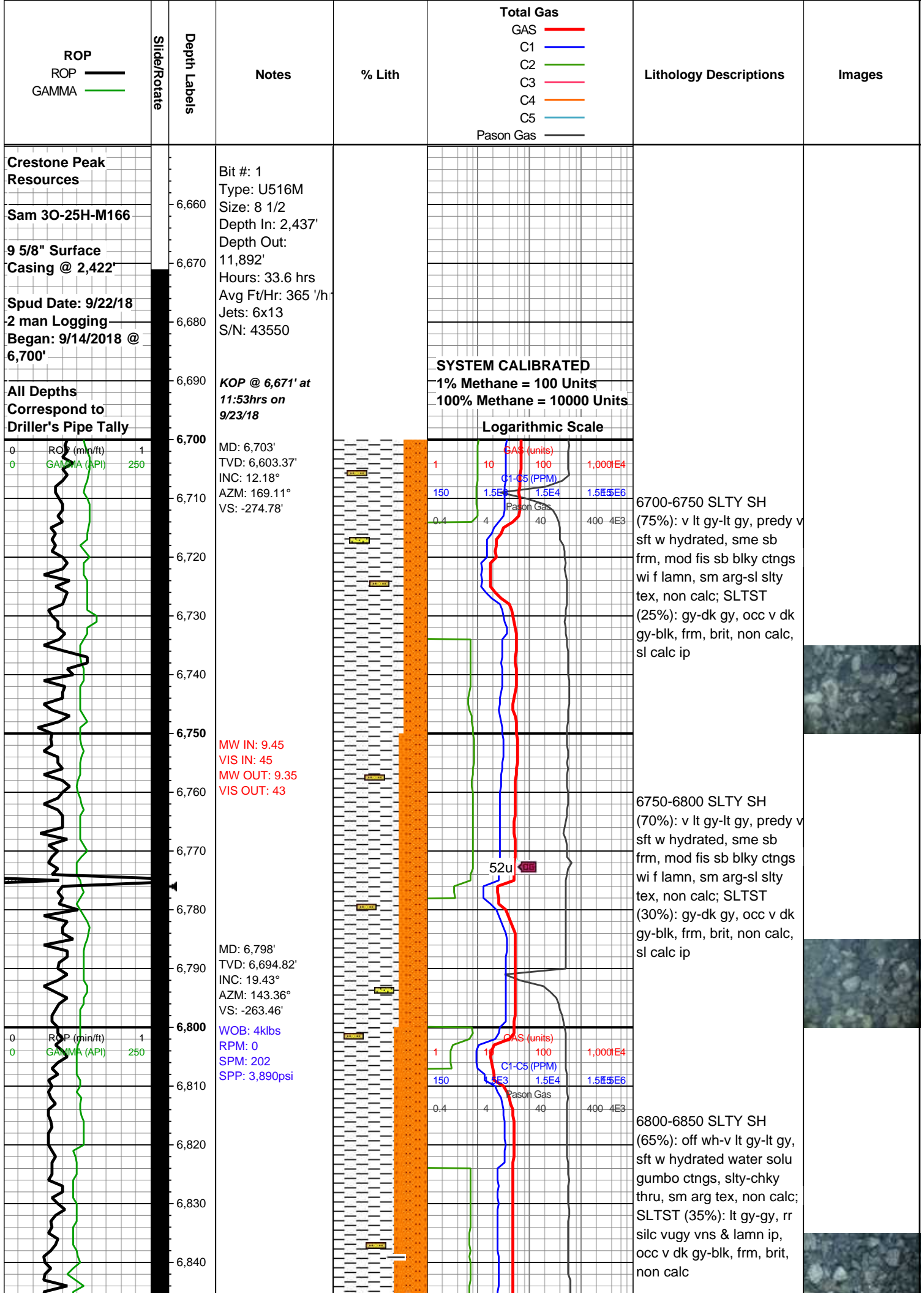
Textures

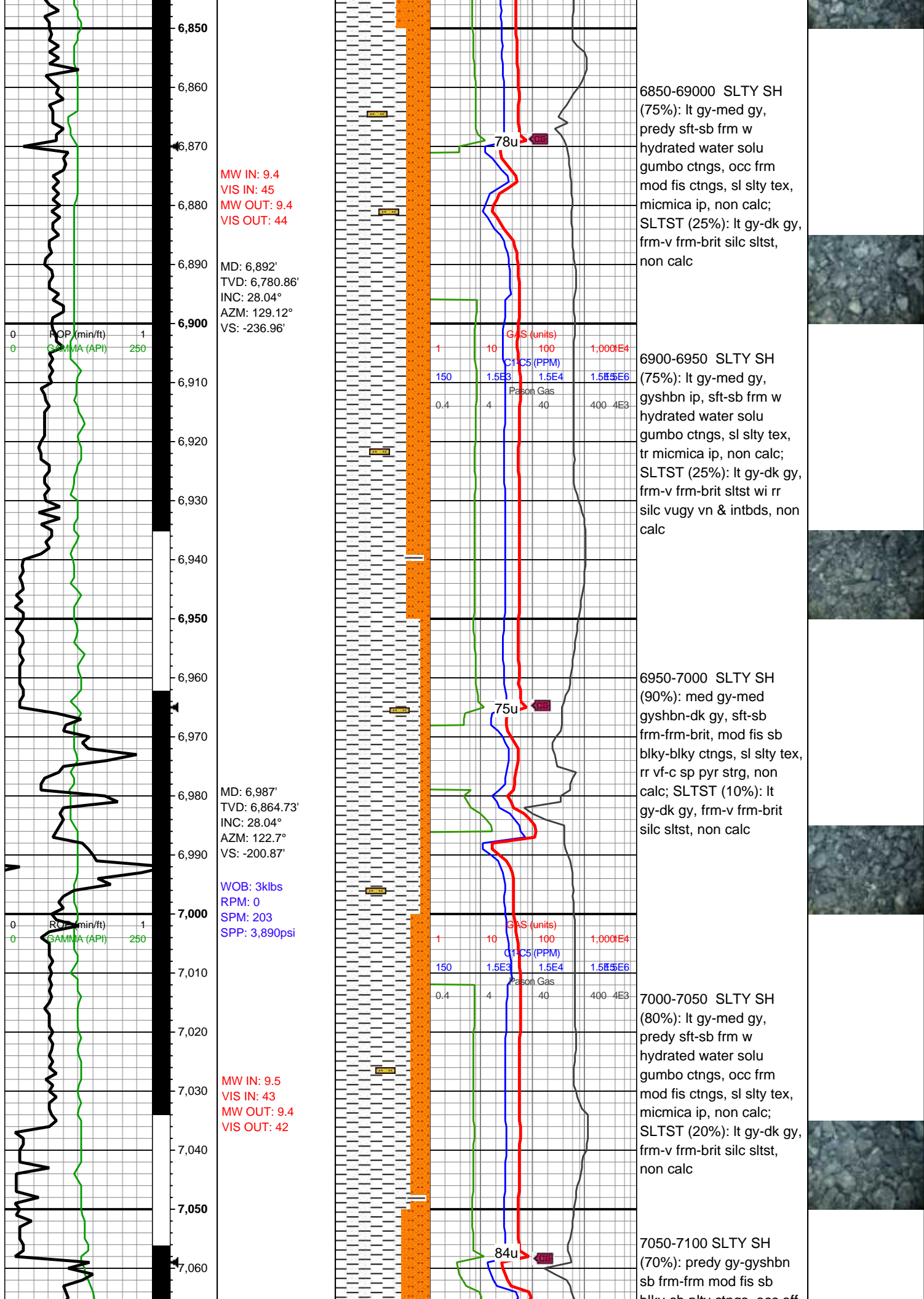
- BOUNDSTONE
- CHALKY
- CRYPTOXLN
- EARTHY
- FINELYXLN
- GRAINSTONE

- LITHOGRAPHIC
- MICROXLN
- MUDSTONE
- PACKSTONE
- WACKESTONE

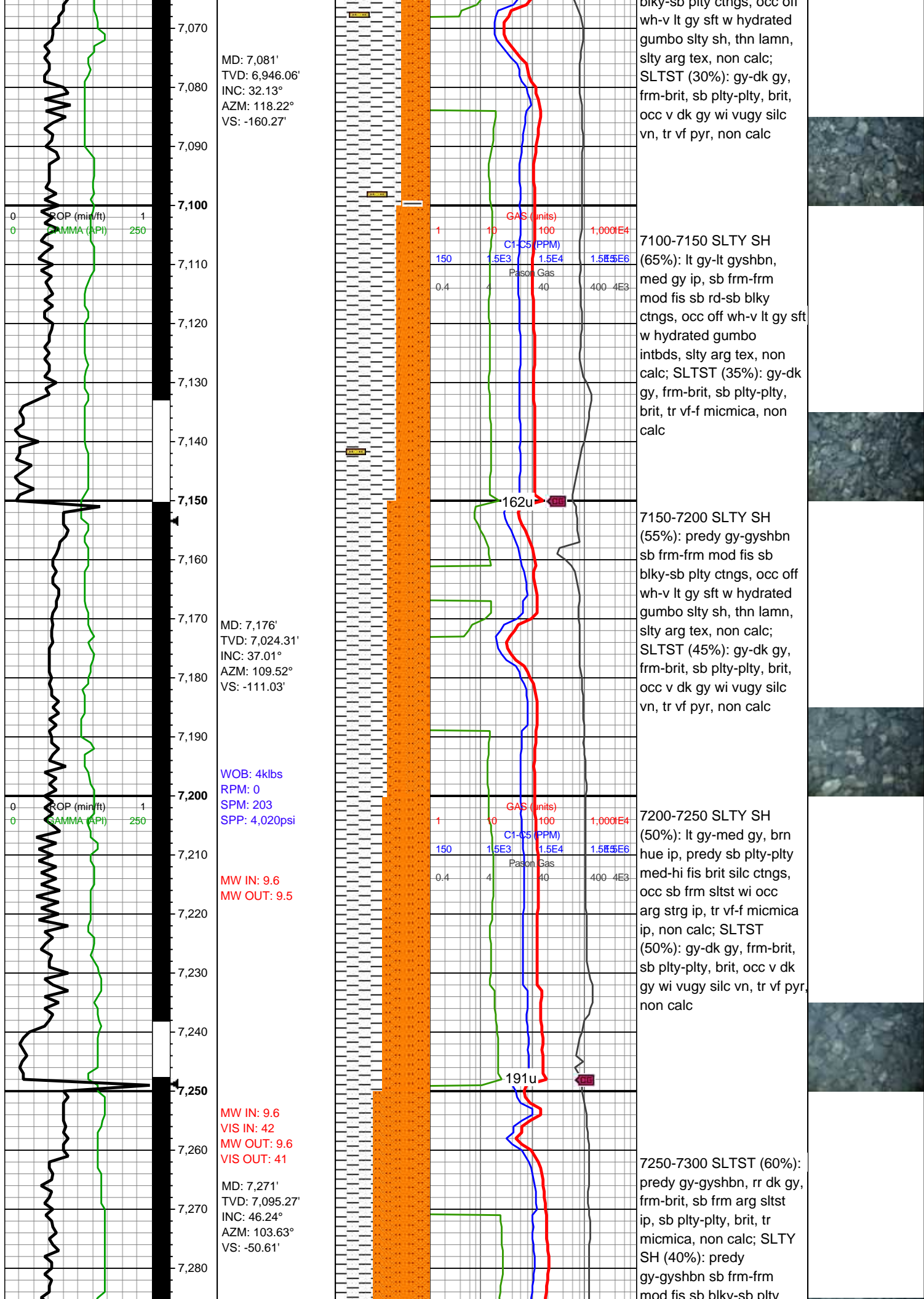
Sorting

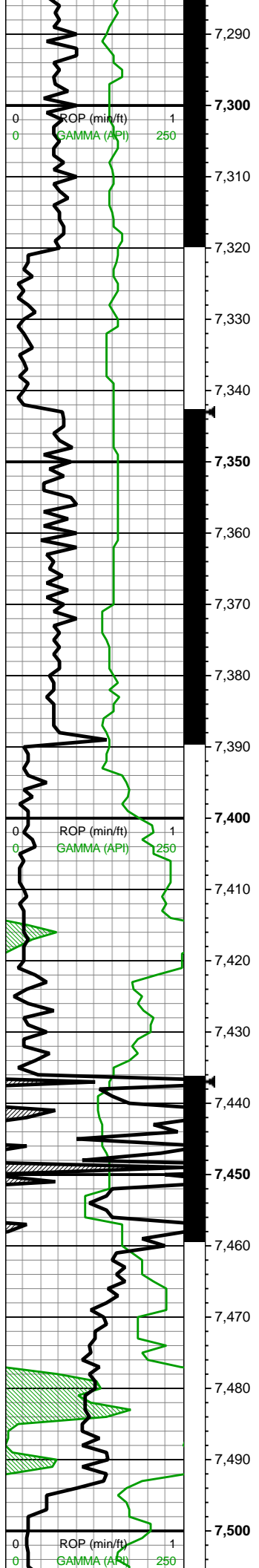
- MODERATE
- POOR
- WELL



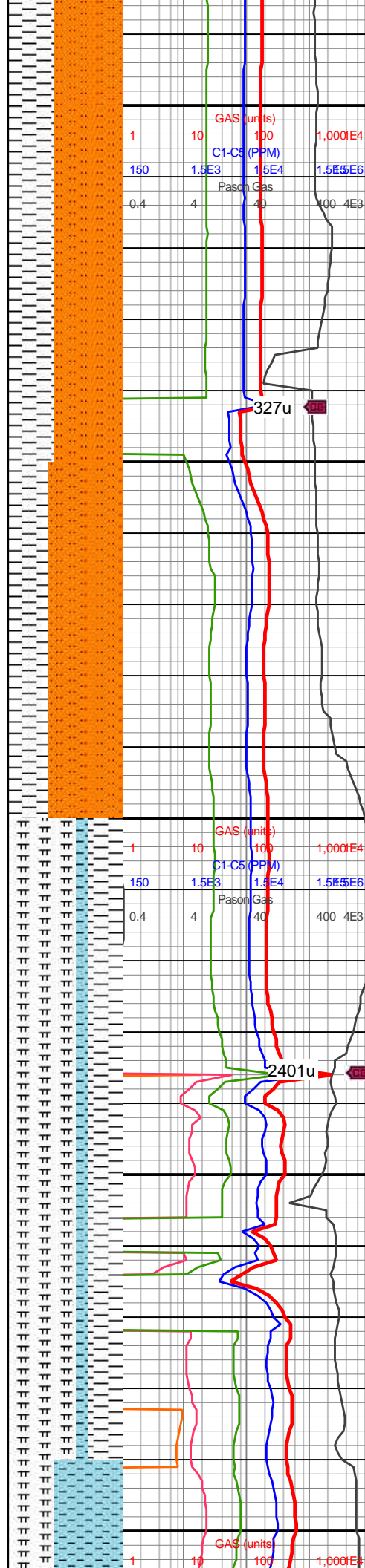






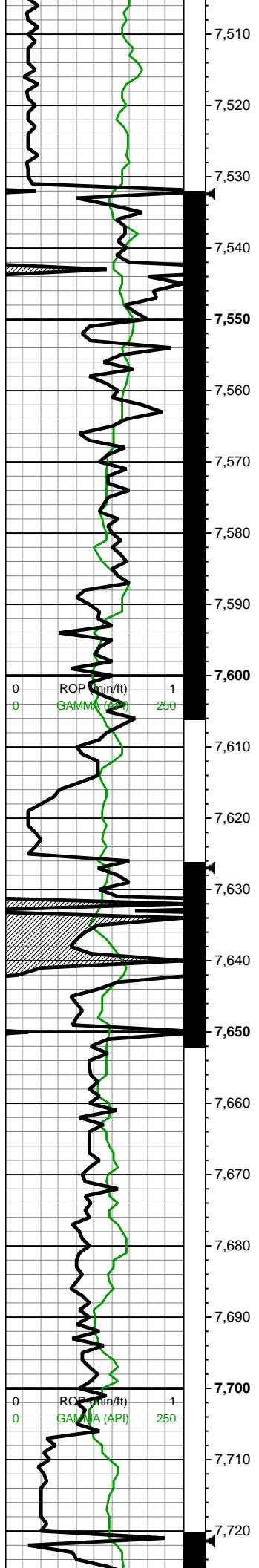


7,290  
7,300  
7,310  
7,320  
7,330  
7,340  
7,350  
7,360 MD: 7,365'  
TVD: 7,155.72'  
INC: 53.67°  
7,370 AZM: 100.99°  
VS: 19.64'  
7,380  
7,390 **Sharon Springs**  
7396MD/7174TVD  
7,400 **WOB: 12klbs**  
**RPM: 30**  
**SPM: 202**  
**SPP: 4,460psi**  
7,410 **Niobrara**  
7418MD/7186TVD  
7,420  
7,430  
7,440  
7,450 **MW IN: 9.7**  
**VIS IN: 41**  
**MW OUT: 9.6**  
**VIS OUT: 41**  
7,460 MD: 7,460'  
TVD: 7,210.43'  
INC: 56°  
7,470 AZM: 99.59°  
VS: 96.02'  
7,480  
7,490  
7,500



ctngs, occ off wh-v lt gy sft  
w hydrated gumbo slty  
sh, thn lamn, slty arg tex,  
non calc  
7300-7350 SLTST (60%):  
predy gy-gyshbn, rr dk gy,  
frm-brit, sb frm arg sltst  
ip, sb plty-plty, brit, tr  
micmica, non calc; SLTY  
SH (40%): predy  
gy-gyshbn sb frm-frm  
mod fis sb blkly-sb plty  
ctngs, occ off wh-v lt gy sft  
w hydrated gumbo slty  
sh, thn lamn, slty arg tex,  
non calc  
7350-7400 SLTST (65%):  
predy gy-gyshbn, rr dk gy,  
frm-brit, sb frm arg sltst  
ip, sb plty-plty, brit, tr  
micmica, non calc; SLTY  
SH (35%): predy  
gy-gyshbn sb frm-frm  
mod fis sb blkly-sb plty  
ctngs, occ off wh-v lt gy sft  
w hydrated gumbo slty  
sh, thn lamn, slty arg tex,  
non calc  
7400-7450 MRLST  
(60%): dk gy-dk gyshbn,  
sb blkly-splt ctngs, sl hd,  
brit, mnv chk intbds, tr  
dissm mic pyr, sl calc;  
SH (30%): gy-dk gy, frm,  
brit, mod fis, sb blkly-blky,  
wh silc vn ip, sl calc; CHK  
(10%): med gy-gyshbn,  
mot, sb blkly-sb tab ctngs,  
sl frm-frm, brit, mnv vf  
lam, sl calc  
7450-7500 MRLST  
(60%): dk gy-dk gyshbn,  
sb blkly-splt ctngs, sl hd,  
brit, mnv chk intbds, tr  
dissm mic pyr, sl calc;  
SH (30%): gy-dk gy, frm,  
brit, mod fis, sb blkly-blky,  
wh silc vn ip, sl calc; CHK  
(10%): med gy-gyshbn,  
mot, sb blkly-sb tab ctngs,  
sl frm-frm, brit, mnv vf  
lam, sl calc





MD: 7,555'  
TVD: 7,261.05'  
INC: 59.6°  
AZM: 98°  
VS: 175.44'

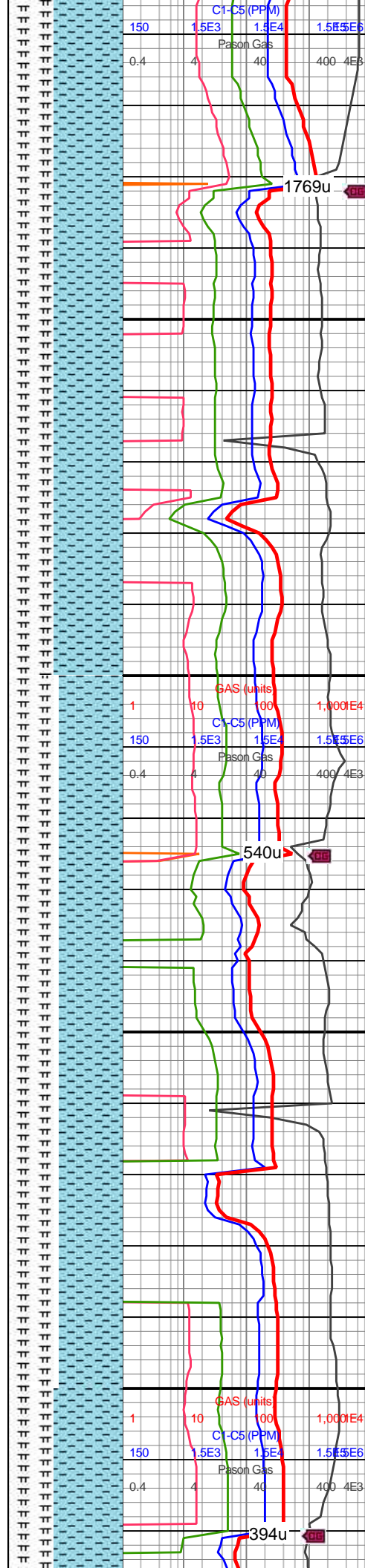
MW IN: 9.8+  
VIS IN: 42  
MW OUT: 9.8  
VIS OUT: 41

WOB: 18klbs  
RPM: 0  
SPM: 200  
SPP: 4,020psi

**B Chalk**  
7644MD/7300TVD  
↔

MD: 7,649'  
TVD: 7,302.15'  
INC: 68.48°  
AZM: 97.39°  
VS: 259.09'

MW IN: 9.8+  
VIS IN: 41  
MW OUT: 9.8+  
VIS OUT: 40



7500-7550 CHK (60%): lt gy-med gy, dk gy ip mot wi wh chky incl & forams, sb frm-frm-brit, l-mod fis sb rd-sb blkly-blky ctngs, sl slty tex, rr forams, tr fos frags, tr vf pyr, hi calc; MRLST (40%): gy-dk gy-dk gyshbn, frm-brit, mod fis sb blkly ctngs, sm-sl slty tex, rr bent, mod calc wi brn mrly resdl

7550-7600 CHK (60%): lt gy-med gy, dk gy ip mot wi wh chky incl & forams, sb frm-frm-brit, l-mod fis sb rd-sb blkly-blky ctngs, sl slty tex, rr forams, tr fos frags, tr vf pyr, mod calc; MRLST (40%): gy-dk gy-dk gyshbn, frm-brit, mod fis sb blkly ctngs, sm-sl slty tex, rr bent, mod calc wi brn mrly resdl

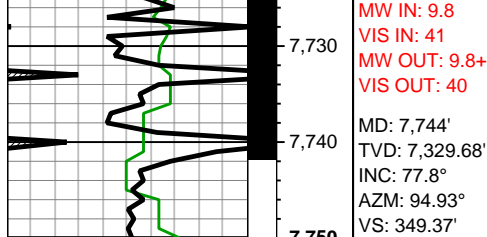
7600-7650 CHK (55%): lt gy-lt gyshbn, occ med gy wi f wh chky incl & lamn, frm, brit, med-hi fis blkly-sb plty ctngs, sl slty tex, mod calc; MRLST (45%): v dk gy, mot wi brn marly incl ip, frm-hd, brit, med fis ang-sb blkly-blky ctngs, thn mrly lamn, sl slty tex, mod f pyr, mod calc

7650-7700 CHK (55%): lt gy-lt gyshbn, occ med gy wi f wh chky incl & lamn, frm, brit, med-hi fis blkly-sb plty ctngs, sl slty tex, mod calc; MRLST (45%): v dk gy, mot wi brn marly incl ip, frm-hd, brit, med fis ang-sb blkly-blky ctngs, thn mrly lamn, sl slty tex, mod f pyr, mod calc

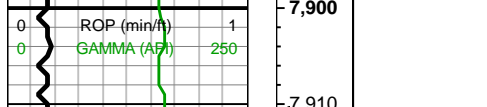
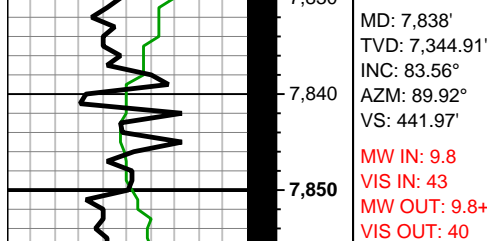
7700-7750 CHK (60%): lt gy-lt gyshbn, occ med gy wi f wh chky incl & lamn, frm, brit, med-hi fis blkly-sb plty ctngs, sl slty





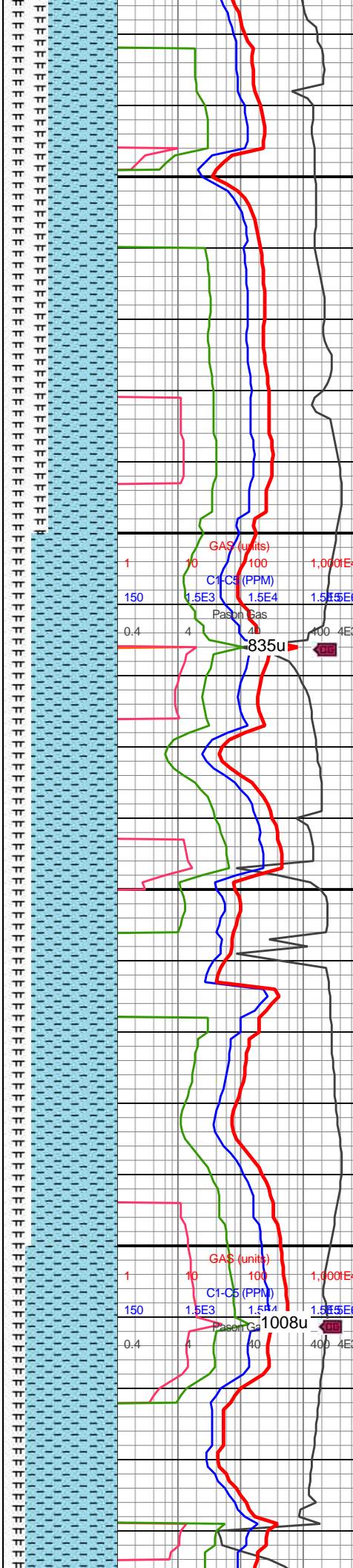


WOB: 35klbs  
RPM: 31  
SPM: 200  
SPP: 4,731psi



**Land curve @  
7,933' MD**

MD: 7,933'  
TVD: 7,353.71'  
INC: 85.8°  
AZM: 88.16°  
VS: 536.54'



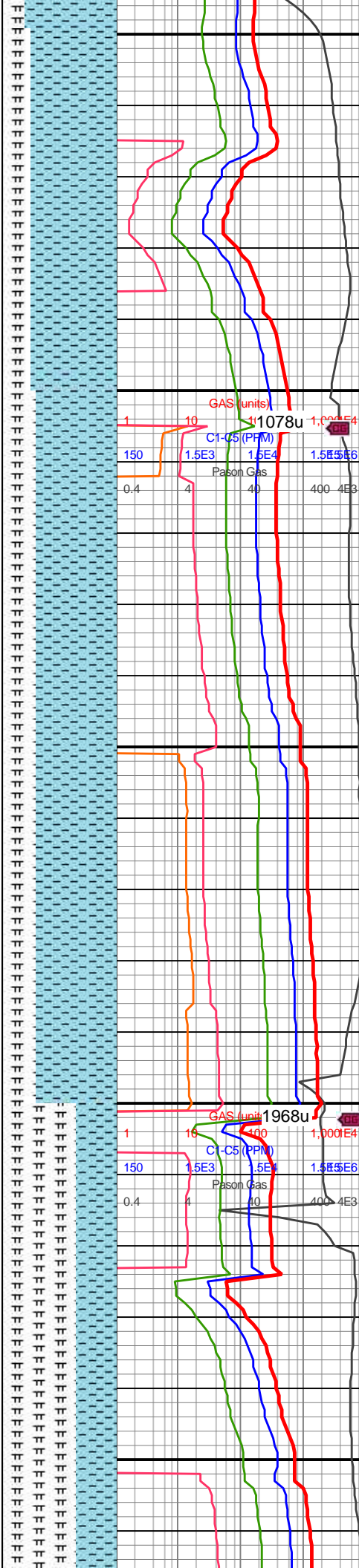
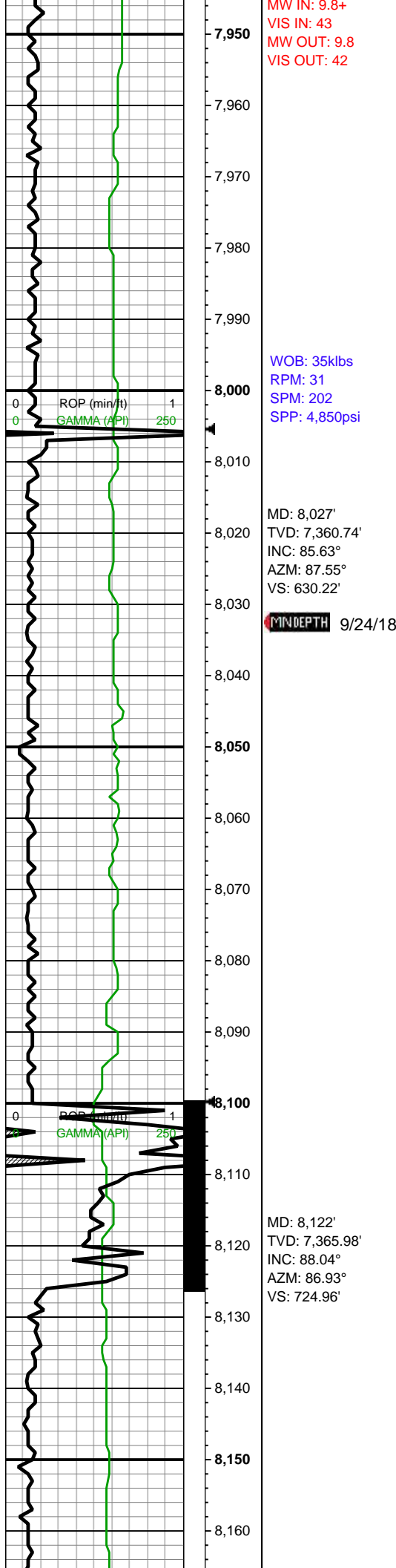
dky-sb pty ctngs, sl slty  
tex, mod calc; MRLST  
(40%): v dk gy, mot wi brn  
marly incl ip, frm-hd, brit,  
med fis ang-sb blkly-blky  
ctngs, thn mrly lamn, sl  
slty tex, mod f pyr, mod  
calc

7750-7800 CHK (60%): lt  
gy-lt gyshbn, occ med gy  
wi f wh chky incl & lamn,  
frm, brit, med-hi fis  
blkly-sb pty ctngs, sl slty  
tex, mod calc; MRLST  
(40%): v dk gy, mot wi brn  
marly incl ip, frm-hd, brit,  
med fis ang-sb blkly-blky  
ctngs, thn mrly lamn, sl  
slty tex, mod f pyr, mod  
calc

7800-7850 CHK (75%):  
off wh-v lt gy-lt gy, sb  
frm-frm, mod fis sb  
blkly-blky-sb pty water  
solu ctngs, sm arg-sl slty  
tex, tr vf pyr, hi calc;  
MRLST (25%): v dk  
gy-blk, frm-brit, mod fis  
sb blkly ctngs, sm-sl slty  
tex, mod calc wi brn mrly  
resdl

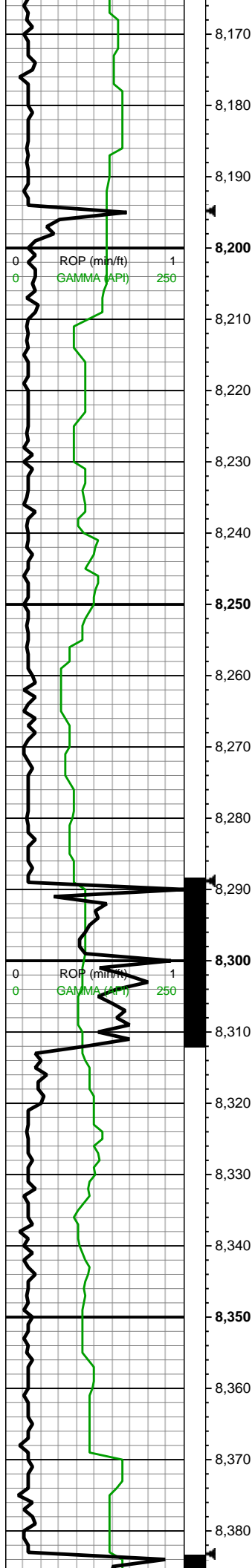
7850-7900 CHK (75%):  
off wh-v lt gy-lt gy, sb  
frm-frm, mod fis sb  
blkly-blky-sb pty water  
solu ctngs, sm arg-sl slty  
tex, tr vf pyr, hi calc;  
MRLST (25%): v dk  
gy-blk, frm-brit, mod fis  
sb blkly ctngs, sm-sl slty  
tex, mod calc wi brn mrly  
resdl

7900-7950 CHK (80%):  
off wh-v lt gy-lt gy, sb  
frm-frm, mod fis sb  
blkly-blky-sb pty water  
solu ctngs, sm arg-sl slty  
tex, tr vf pyr, hi calc;  
MRLST (20%): v dk  
gy-blk, frm-brit, mod fis  
sb blkly ctngs, sm-sl slty  
tex, mod calc wi brn mrly  
resdl



7950-8000 CHK (75%):  
off wh-v lt gy-lt gy, sb  
frm-frm, mod fis sb  
blky-blky-sb plty water  
solu ctngs, sm arg-sl slty  
tex, tr vf pyr, hi calc;  
MRLST (25%): v dk  
gy-blk, frm-brit, mod fis  
sb blky ctngs, sm-sl slty  
tex, mod calc wi brn mrly  
resdl

8000-8100 CHK (70%):  
off wh-v lt gy-lt gy, sb  
frm-frm, mod fis sb  
blky-blky-sb plty water  
solu ctngs, sm arg-sl slty  
tex, tr vf pyr, hi calc;  
MRLST (30%): v dk  
gy-blk, frm-brit, mod fis  
sb blky ctngs, sm-sl slty  
tex, mod calc wi brn mrly  
resdl



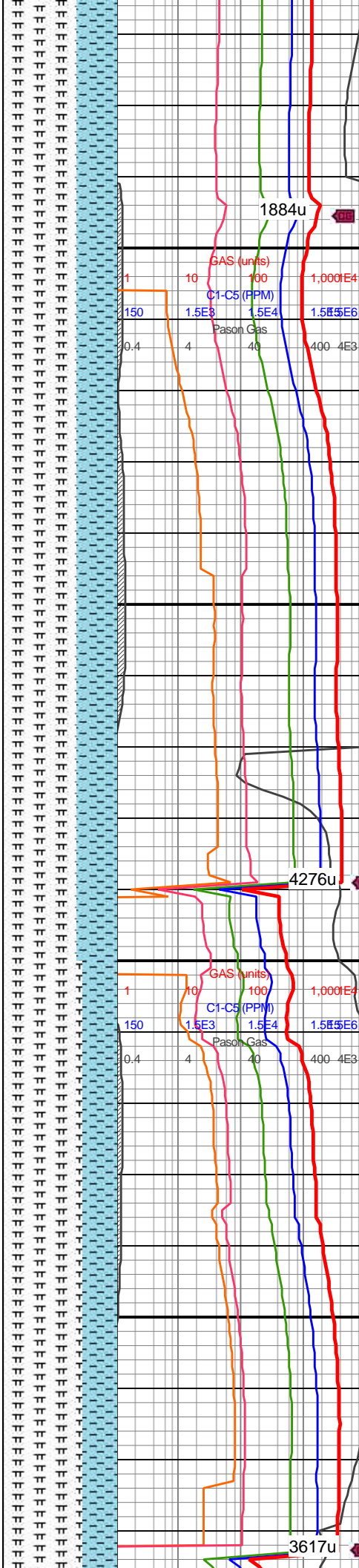
MW IN: 9.8+  
VIS IN: 43  
MW OUT: 9.8  
VIS OUT: 41

WOB: 26klbs  
RPM: 65  
SPM: 202  
SPP: 4,645psi

MD: 8,216'  
TVD: 7,368.01'  
INC: 89.49°  
AZM: 86.14°  
VS: 818.77'

MD: 8,311'  
TVD: 7,368.67'  
INC: 89.71°  
AZM: 87.28°  
VS: 913.62'

MW IN: 9.8+  
VIS IN: 45  
MW OUT: 9.8+  
VIS OUT: 43

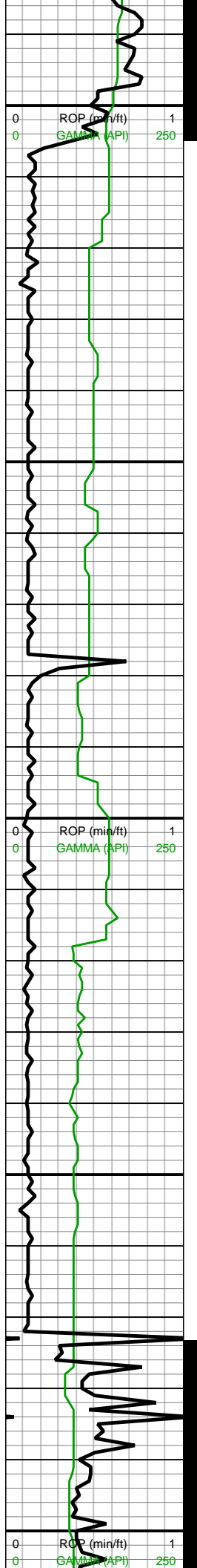


8100-8200 MRLST (65%)  
pred med gry wi sme dk  
gry, v hrd, sme sl lt gy  
chky lam, occ micmica;  
CHK (35%) lt-med  
gyshbn wi sme med brn,  
sub blkyl-plty, frm-sl brit,  
occ-rr lam

8200-8300 MRLST (65%)  
pred med gry wi sme dk  
gry, v hrd, sme sl lt gy  
chky lam, occ micmica;  
CHK (35%) lt-med  
gyshbn wi sme med brn,  
sub blkyl-plty, frm-sl brit,  
occ-rr lam

8300-8400 CHK(80%):  
med gy-sl gyshbn, sub  
blkyl-sub plty med fis  
ctngs, frm, occ-com fos  
frags, rr forams tr vf-uf





WOB: 0klbs  
RPM: 65  
SPM: 202  
SPP: 4,070psi

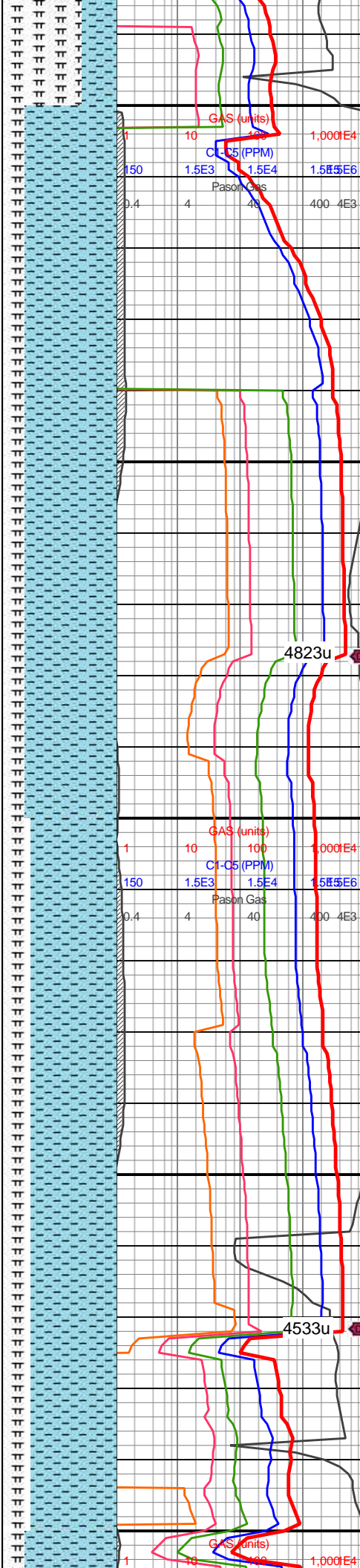
MD: 8,405'  
TVD: 7,369.83'  
INC: 88.88°  
AZM: 89.39°  
VS: 1,007.57'

MD: 8,500'  
TVD: 7,371.47'  
INC: 89.14°  
AZM: 88.86°  
VS: 1,102.54'

MW IN: 9.8  
VIS IN: 44  
MW OUT: 9.8  
VIS OUT: 43

MD: 8,594'  
TVD: 7,373.6'  
INC: 88.26°  
AZM: 90.71°  
VS: 1,196.51'

WOB: 34klbs  
RPM: 0  
SPM: 202  
SPP: 4,415psi

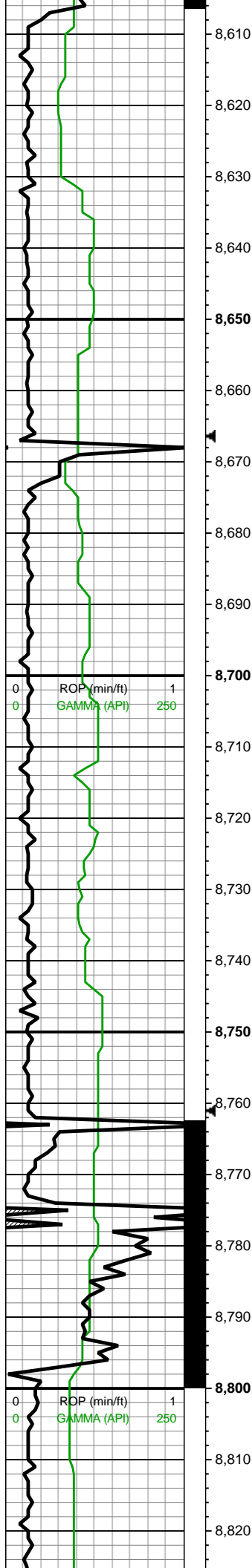


pyr, hi calc; MRLST  
(20%): dk gyshbn-dk gy,  
frm-sl hd-brit, mod calc, tr  
CHK incl

8400-8500 CHK(80%):  
med gy-sl gyshbn, sub  
blky-sub plty med fis  
ctngs, frm, occ-com fos  
frags, rr forams, tr vf-uf  
pyr, hi calc; MRLST  
(20%): dk gyshbn-dk gy,  
frm-sl hd-brit, mod calc, tr  
CHK incl

8500-8600 CHK(75%):  
med gy-sl gyshbn, sub  
blky-sub plty med fis  
ctngs, frm, occ-com fos  
frags, rr forams, tr vf-uf  
pyr, hi calc; MRLST  
(25%): dk gyshbn-dk gy,  
frm-sl hd-brit, mod calc, tr  
CHK incl





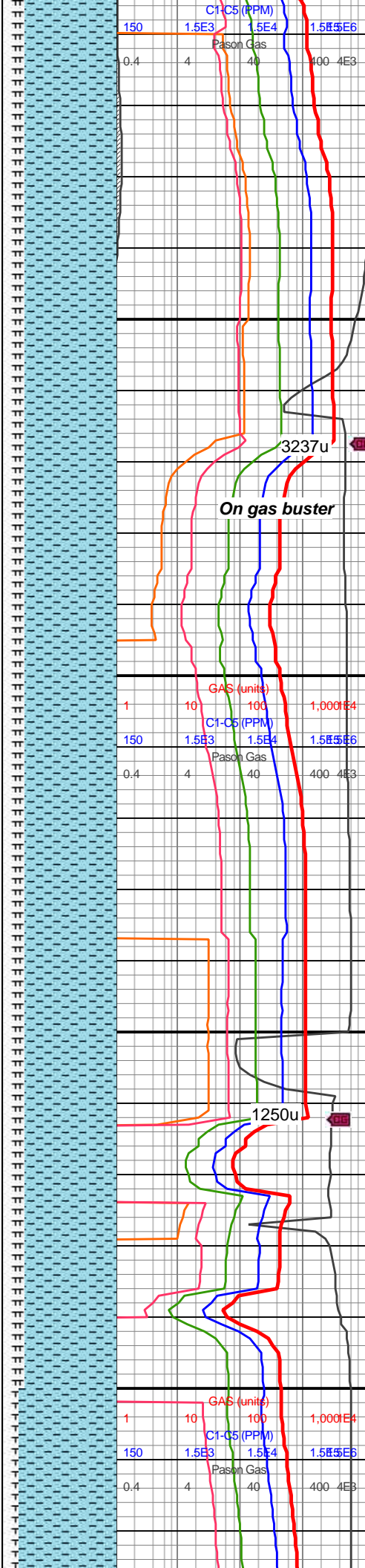
**On gas buster**

MD: 8,688'  
TVD: 7,377.39'  
INC: 87.12°  
AZM: 91.15°  
VS: 1,290.42'

MW IN: 9.8  
VIS IN: 42  
MW OUT: 9.8  
VIS OUT: 41

MD: 8,783'  
TVD: 7,381.69'  
INC: 87.69°  
AZM: 90.01°  
VS: 1,385.32'

WOB: 23klbs  
RPM: 65  
SPM: 204  
SPP: 4,680psi



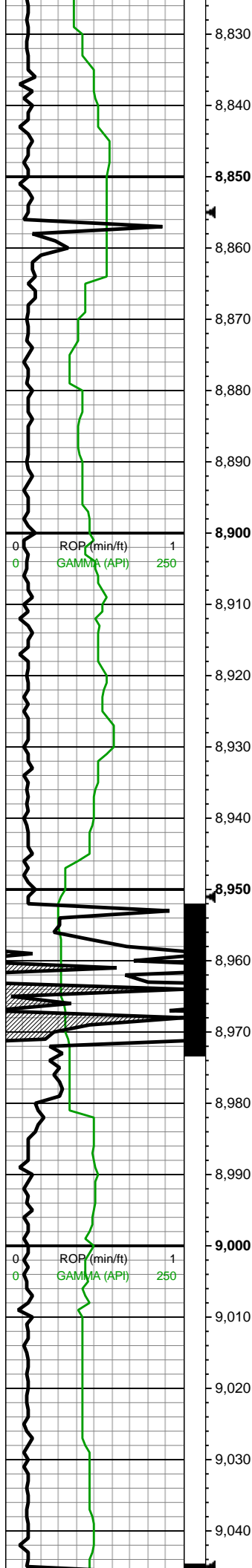
**On gas buster**

3237u

1250u

8600-8700 CHK(80%):  
med gy-sl gyshbn, sub  
blky-sub plty med fis  
ctngs, frm, occ-com fos  
frags, rr forams, tr vf-uf  
pyr, hi calc; MRLST  
(20%): dk gyshbn-dk gy,  
frm-sl hd-brit, mod calc, tr  
CHK incl

8700-8800 CHK(80%):  
med gy-sl gyshbn, sub  
blky-sub plty med fis  
ctngs, frm, occ-com fos  
frags, rr forams, tr vf-uf  
pyr, hi calc; MRLST  
(20%): dk gyshbn-dk gy,  
frm-sl hd-brit, mod calc, tr  
CHK incl



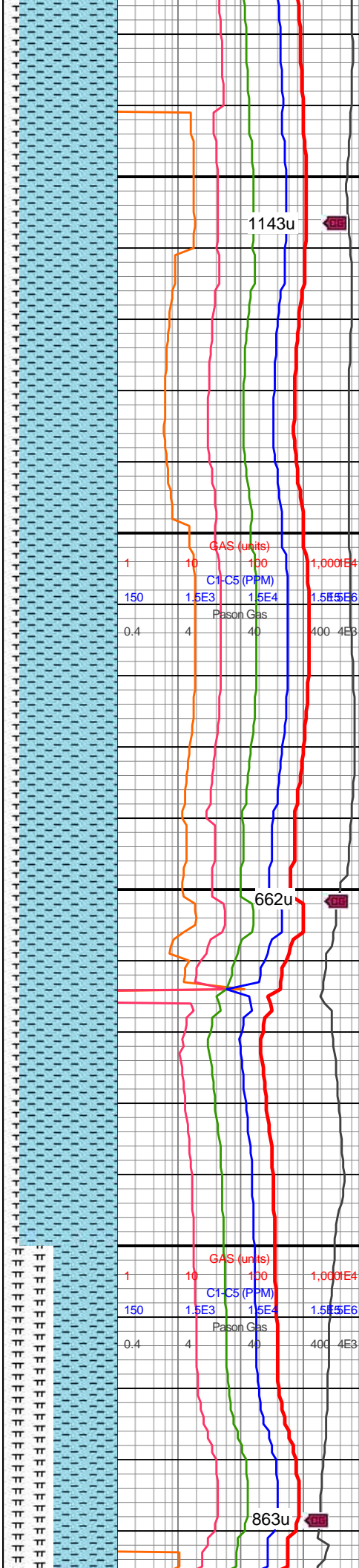
MD: 8,878'  
TVD: 7,384.9'  
INC: 88.44°  
AZM: 88.95°  
VS: 1,480.26'

MW IN: 9.7+  
VIS IN: 43  
MW OUT: 9.7+  
VIS OUT: 41

MD: 8,972'  
TVD: 7,387.46'  
INC: 88.44°  
AZM: 88.16°  
VS: 1,574.2'

WOB: 34klbs  
RPM: 65  
SPM: 202  
SPP: 4,960psi

MW IN: 9.8+  
VIS IN: 43  
MW OUT: 9.7



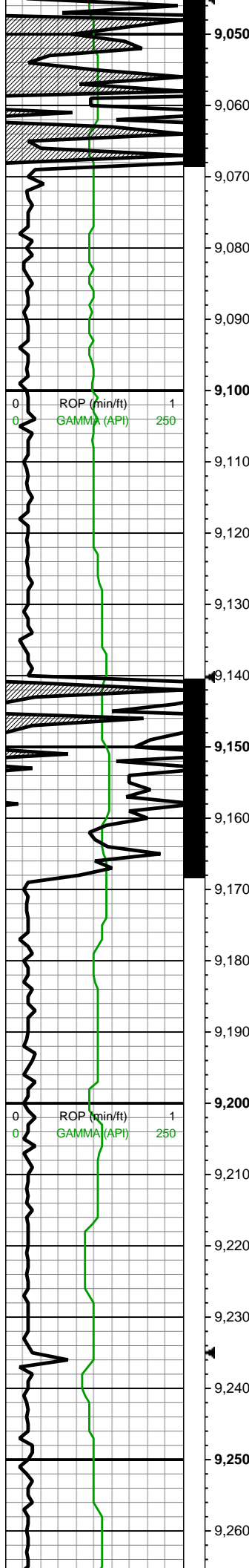
1143u

662u

863u

8800-8900 CHK (85%)  
med gyshbn-lt gy, mot,  
sb blkly wi occ plty, v chky  
tex, v sft-sl frm, scat-com  
inoc fos frags, tr-rr pyr, v  
calc; MRLST (15%)  
med-dk gry wi sme lt gy,  
sb-blky, sl lam-rr  
micmica, v calc, sme  
scat cal

8900-9000 CHK (85%)  
med gyshbn-lt gy, mot,  
sb blkly wi occ plty, v chky  
tex, v sft-sl frm, scat-com  
inoc fos frags, tr-rr pyr, v  
calc; MRLST (15%)  
med-dk gry wi sme lt gy,  
sb-blky, sl lam-rr  
micmica, v calc, sme  
scat cal



MD: 9,068'  
TVD: 7,389.52'  
INC: 89.1°  
AZM: 87.11°  
VS: 1,670.09'

MW IN: 9.9  
VIS IN: 42  
MW OUT: 9.85  
VIS OUT: 40

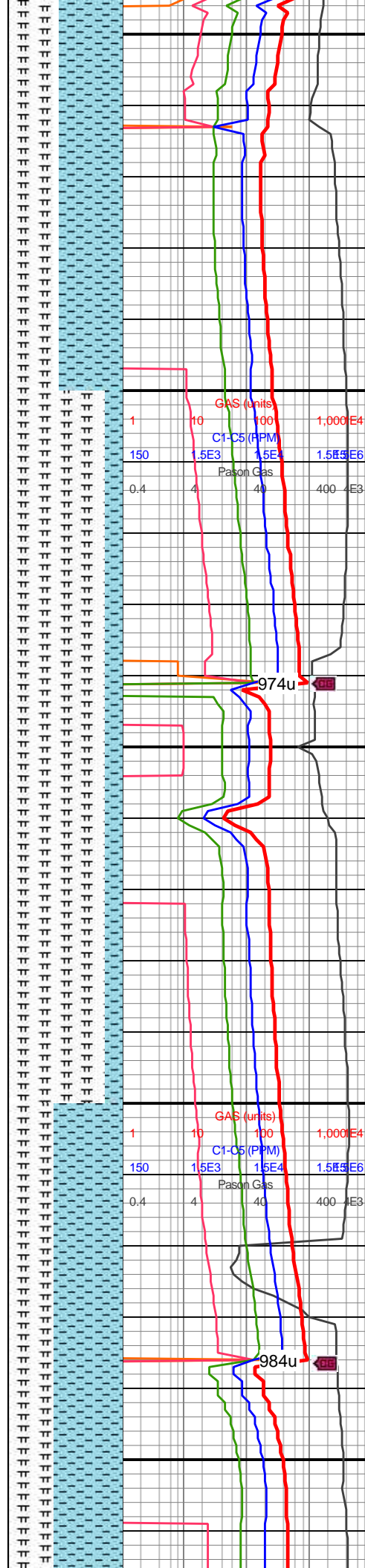
MD: 9,162'  
TVD: 7,389.27'  
INC: 91.21°  
AZM: 89.48°  
VS: 1,764.04'

WOB: 32klbs  
RPM: 65  
SPM: 202  
SPP: 4,990psi

MW IN: 9.85  
VIS IN: 42  
MW OUT: 9.9  
VIS OUT: 40

MD: 9,257'  
TVD: 7,386.97'  
INC: 91.56°  
AZM: 89.65°  
VS: 1,859.01'

VIS OUT: 41

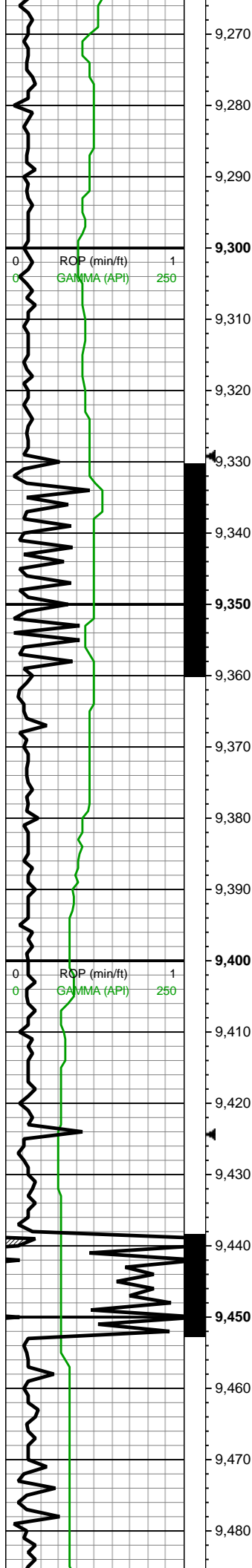


9000-9100 CHK (55%):  
lt-med gy-lt-med gyshbn,  
occ-com f-u f wh chky incl  
& forams thru, frm, brit,  
mod fis ang-sb blkly-blky  
ctngs, sl slty tex, rr-occ  
wh-tn bent wi pyrc strg ip,  
rr-occ wh forams, tr fos  
frags, tr cal, tr vf pyr-pyrc  
strg, hi calc; MRLST  
(45%): dk gy-v dk gy, frm,  
mod fis sb blkly-blky brit  
ctngs, slty tex, tr yel o stn,  
mod calc wi brn mrly  
resdl

9100-9200 MRLST  
(85%): dk gy-dk gyshbn-v  
dk gy, frm, brit, mod fis sb  
blkly-blky ctngs, slty tex,  
mod calc wi brn mrly  
resdl; CHK (15%): dk gy  
wi rr-occ f wh chky incl &  
foram & chky intbds, frm,  
brit, mod fis ang-sb  
blkly-blky ctngs, sl slty tex,  
rr bent, rr-occ wh forams,  
tr fos frags, tr vf pyr

9200-9300 CHK (60%):  
dk gy wi rr-occ f wh chky  
incl & foram & chky

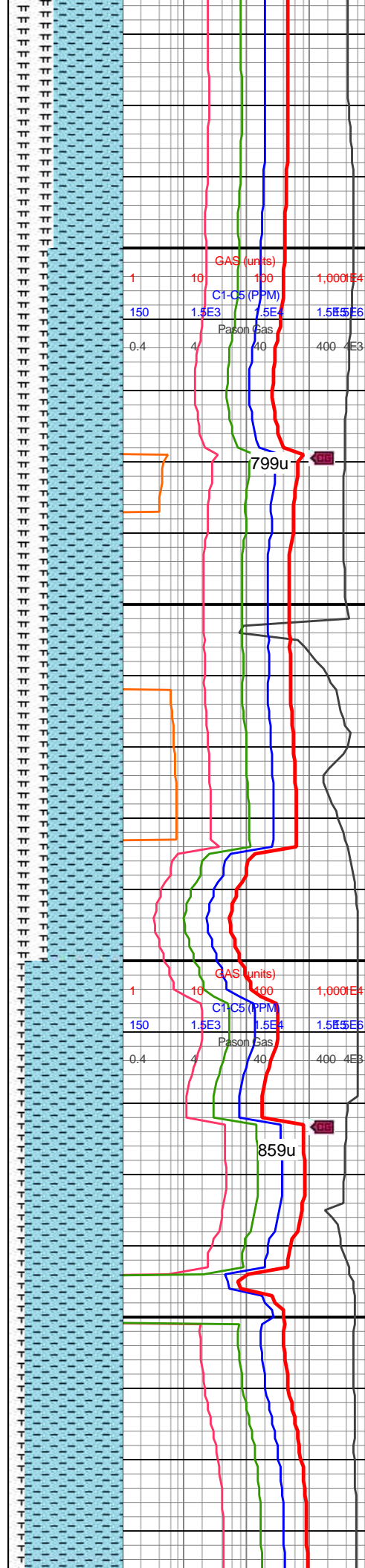




MD: 9,352'  
TVD: 7,384.17'  
INC: 91.82°  
AZM: 89.83°  
VS: 1,953.97'

WOB: 41klbs  
RPM: 65  
SPM: 188  
SPP: 4,730psi

MD: 9,447'  
TVD: 7,382.57'  
INC: 90.11°  
AZM: 88.95°  
VS: 2,048.95'



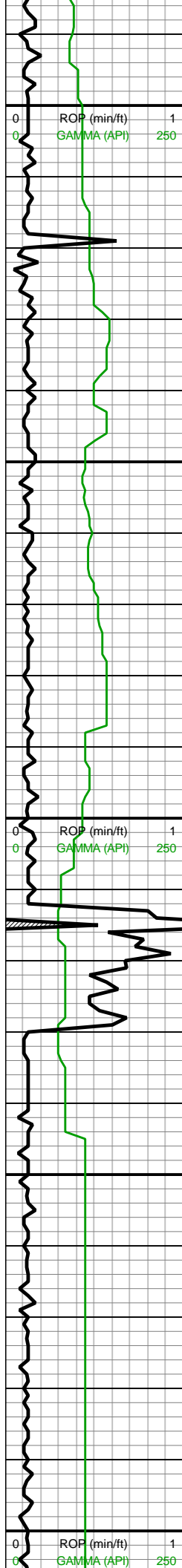
incl & foram & chky  
intbds, frm, brit, mod fis  
ang-sb blky-blky ctngs, sl  
silty tex, rr bent, rr-occ wh  
forams, tr fos frags, tr vf  
pyr; MRLST (40%): dk  
gy-dk gyshbn-v dk gy, frm,  
brit, mod fis sb blky-blky  
ctngs, slty tex, mod calc  
wi brn mrly resdl

9300-9400 CHK (65%):  
dk gy wi rr-occ chky lamn  
& f incl, frm-brit, mod fis  
ang-sb blky-blky ctngs, sl  
silty tex, rr-occ wh forams,  
tr bent, tr vf pyr & tr pyrc  
strg; MRLST (35%): dk  
gy-dk gyshbn-v dk gy, frm,  
brit, mod fis sb blky-blky  
ctngs, slty tex, mod calc  
wi brn mrly resdl

9400-9500 CHK (85%): lt  
gy-med gy, occ dk gy wi f  
wh chky incl & thn chky  
lamn, frm, brit, mod fis  
ang-sb blky-blky ctngs, sl  
silty tex, rr-occ wh forams,  
tr fos frags & mict cal, tr vf  
pyr; MRLST (15%): dk  
gy-dk gyshbn-v dk gy, frm,







9,490  
9,500  
9,510  
9,520  
9,530  
9,540  
9,550  
9,560  
9,570  
9,580  
9,590  
9,600  
9,610  
9,620  
9,630  
9,640  
9,650  
9,660  
9,670  
9,680  
9,690  
9,700

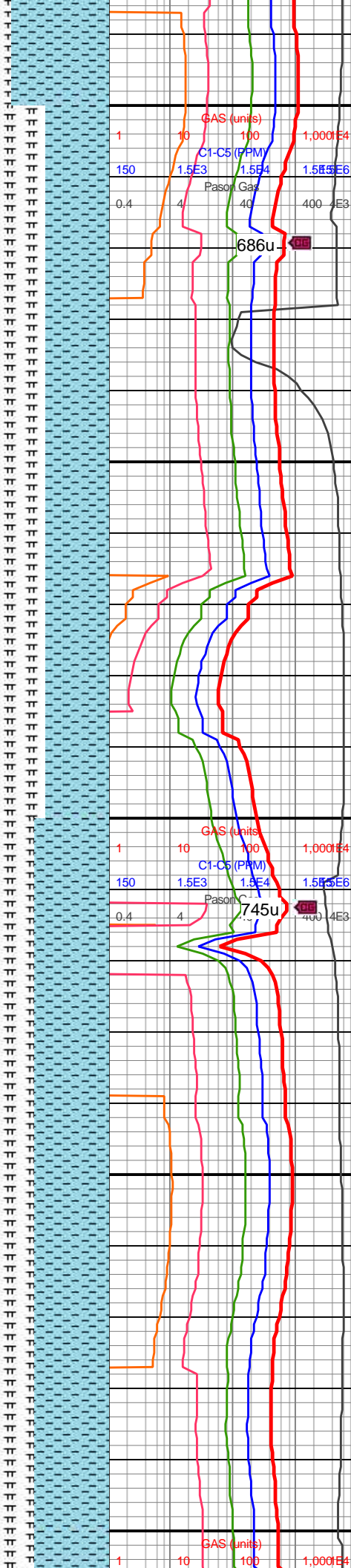
MW IN: 9.9  
VIS IN: 42  
MW OUT: 9.9  
VIS OUT: 41

MD: 9,541'  
TVD: 7,381.77'  
INC: 90.86°  
AZM: 90.09°  
VS: 2,142.94'

WOB: 41kbs  
RPM: 65  
SPM: 186  
SPP: 4,700psi

MD: 9,635'  
TVD: 7,382.74'  
INC: 87.96°  
AZM: 88.25°  
VS: 2,236.92'

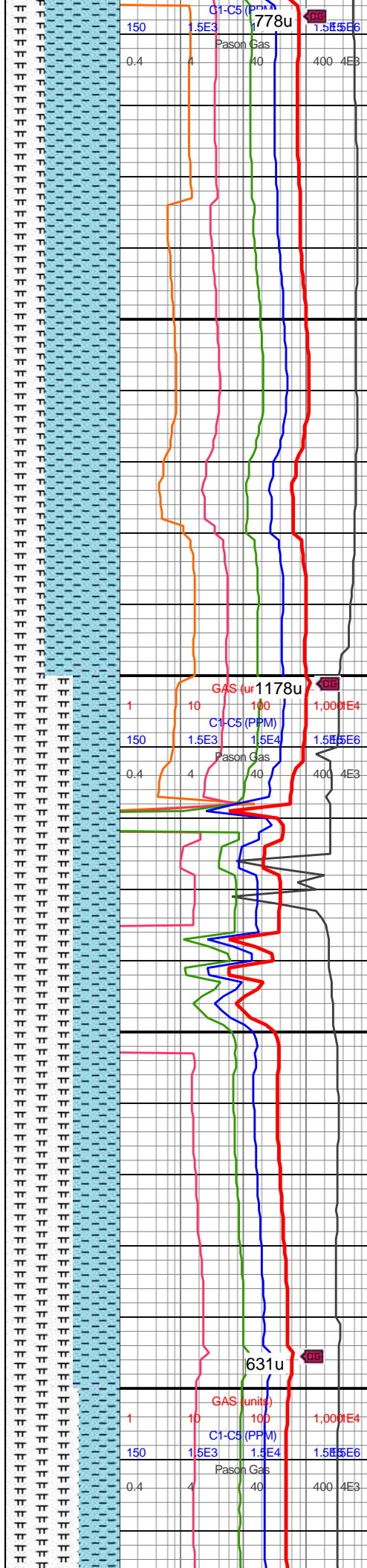
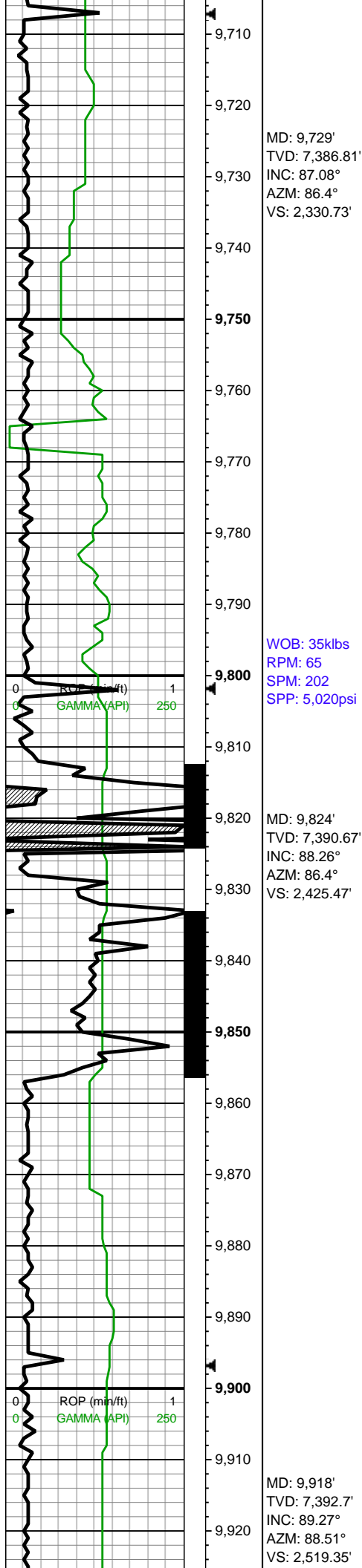
MW IN: 9.9  
VIS IN: 42  
MW OUT: 9.85  
VIS OUT: 41



brit, mod fis sb blkly-blky  
ctngs, slty tex, mod calc  
wi brn mrly resdl

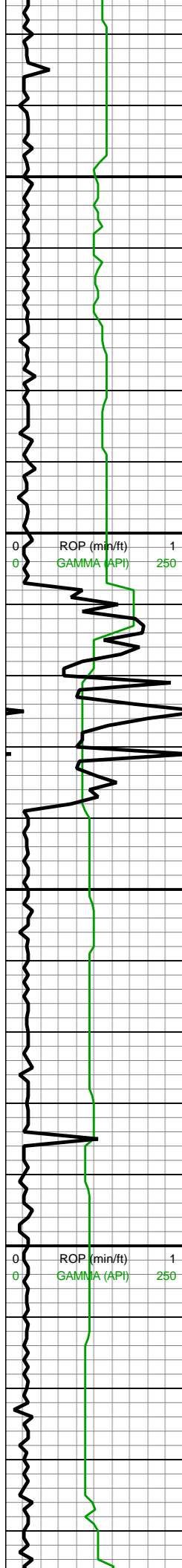
9500-9600 CHK (55%):  
dk gy wi rr-occ chky lamn  
& f incl, frm-brit, mod fis  
ang-sb blkly-blky ctngs, sl  
slty tex, rr-occ wh forams,  
tr bent, tr vf pyr & tr pyrc  
strg; MRLST (45%): dk  
gy-dk gyshbn-v dk gy, frm,  
brit, mod fis sb blkly-blky  
ctngs, slty tex, mod calc  
wi brn mrly resdl

9600-9700 CHK (65%):  
dk gy wi rr-occ chky lamn  
& f incl, frm-brit, mod fis  
ang-sb blkly-blky ctngs, sl  
slty tex, rr-occ wh forams,  
tr bent, tr vf pyr & tr pyrc  
strg; MRLST (35%): dk  
gy-dk gyshbn-v dk gy, frm,  
brit, mod fis sb blkly-blky  
ctngs, slty tex, mod calc  
wi brn mrly resdl



9700-9800 CHK (65%): lt  
gy-med gy, dk gy ip wi f  
wh chky incl, frm-brit,  
mod fis ang-sb blkly-blky  
ctngs, sl slty tex, rr-occ  
wh forams, rr yel o drop,  
tr vf pyr; MRLST (35%): dk  
gy, frm, brit, mod fis sb  
blkly-blky ctngs, slty tex,  
mod calc wi brn mrly  
resdl

9800-9900 MRLST  
(60%): dk gy-dk gyshbn-v  
dk gy, frm, brit, mod fis sb  
blkly-blky ctngs, slty tex,  
mod calc wi brn mrly  
resdl; CHK (40%): dk gy  
wi rr-occ f wh chky incl &  
foram & chky intbds, frm,  
brit, mod fis ang-sb  
blkly-blky ctngs, sl slty tex,  
rr bent, rr-occ wh forams,  
tr fos frags, tr vf pyr



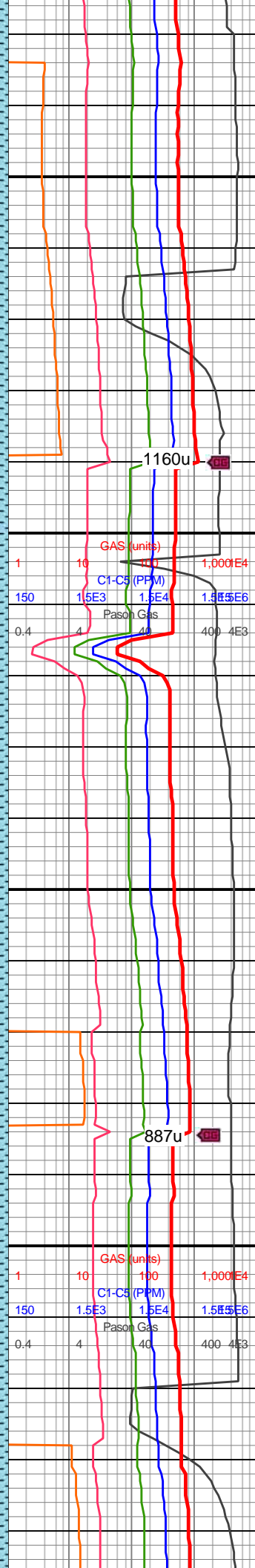
9,930  
9,940  
9,950  
9,960  
9,970  
9,980  
9,990  
10,000  
10,010  
10,020  
10,030  
10,040  
10,050  
10,060  
10,070  
10,080  
10,090  
10,100  
10,110  
10,120  
10,130  
10,140

WOB: 41klbs  
RPM: 66  
SPM: 202  
SPP: 5,340psi

MD: 10,013'  
TVD: 7,393.5'  
INC: 89.76°  
AZM: 86.75°  
VS: 2,614.27'

MW IN: 9.9  
VIS IN: 43  
MW OUT: 9.9  
VIS OUT: 41

MD: 10,108'  
TVD: 7,393.53'  
INC: 90.2°  
AZM: 86.58°  
VS: 2,709.12'

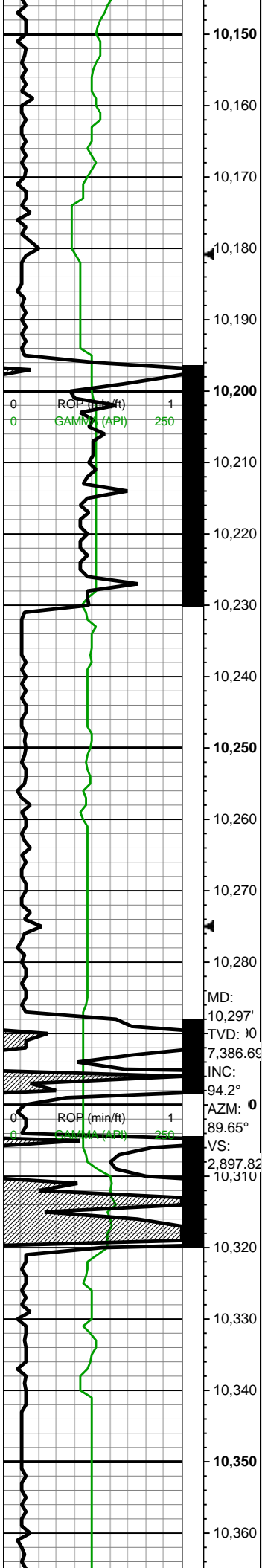


9900-10000 MRLST  
(65%): dk gy-dk gyshbn-v  
dk gy, frm-brit, mod fis sb  
blky-blky ctngs, slty tex,  
mod calc wi brn mrly  
resdl; CHK (35%): dk gy,  
f-elong wh chky incl ip,  
frm, brit, mod fis ang-sb  
blky-blky ctngs, sl slty tex,  
tr bent, rr wh forams, tr vf  
pyr

10000-10100 CHK  
(55%): lt gy-med gy, dk gy  
ip wi f wh chky incl,  
frm-brit, mod fis ang-sb  
blky-blky ctngs, sl slty tex,  
rr-occ wh forams, rr yel o  
drop, tr vf pyr; MRLST  
(45%): dk gy, frm, brit,  
mod fis sb blky-blky  
ctngs, slty tex, mod calc  
wi brn mrly resdl





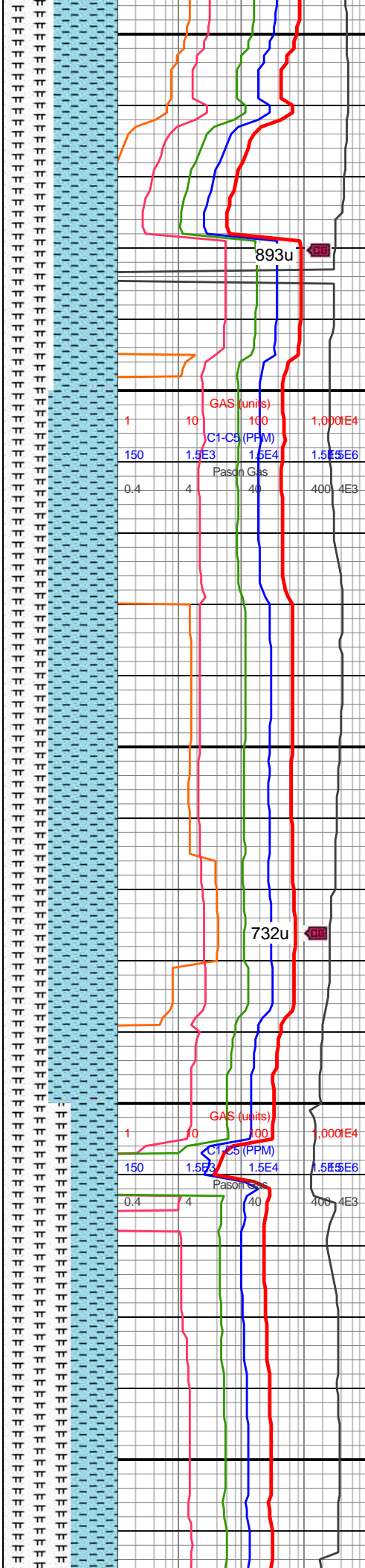


WOB: 26klbs  
RPM: 0  
SPM: 204  
SPP: 4,750psi

MD: 10,203'  
TVD: 7,391.74'  
INC: 91.96°  
AZM: 87.9°  
VS: 2,803.99'

MD: 10,297'  
TVD: 10,738.69'  
INC: 94.2°  
AZM: 89.65°  
VS: 2,897.82'

MW IN: 9.8  
VIS IN: 41  
MW OUT: 9.85

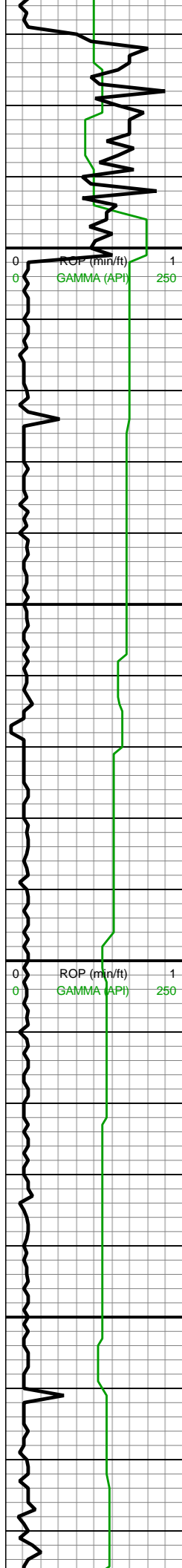


10100-10200 CHK  
(55%): med gy wi f ch  
chky/foram incl, frm-brit,  
mod fis ang-sb blkylkly  
ctngs, sl slty tex, rr-occ  
wh forams, tr vf pyr;  
MRLST (45%): dk gy-dk  
gyshbn, frm-brit, mod fis  
sb blkylkly ctngs, slty  
tex, rr yel o drop, mod  
calc wi brn mrly resdl

10200-10300 CHK  
(60%): lt gy-med gy, dk gy  
ip wi f wh chky incl,  
frm-brit, mod fis ang-sb  
blkylkly ctngs, sl slty tex,  
rr-occ wh forams, tr vf pyr;  
MRLST (40%): dk gy, frm, brit,  
mod fis sb blkylkly  
ctngs, slty tex, mod calc  
wi brn mrly resdl

10300-10400 MRLST  
(60%): dk gy-dk gyshbn-v  
dk gy, frm, brit, mod fis sb





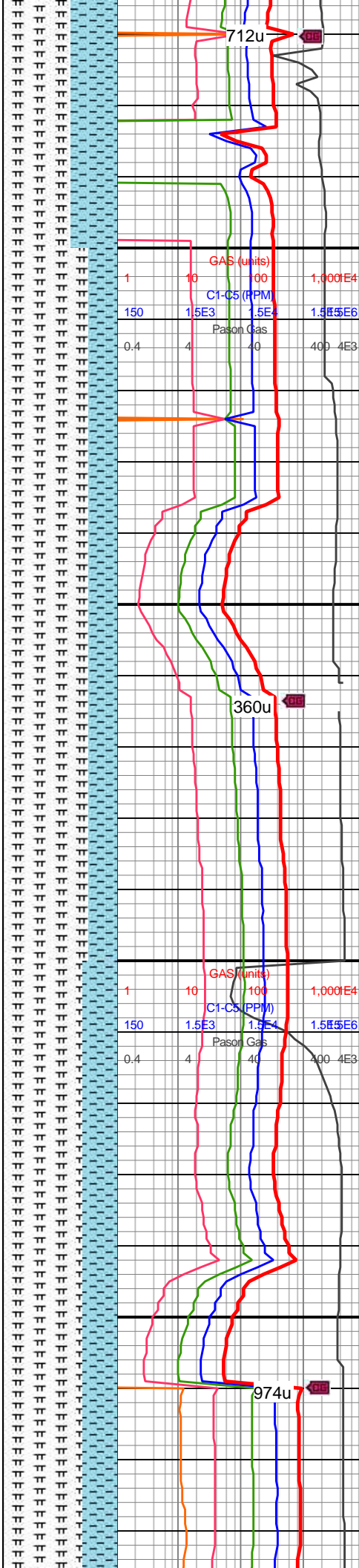
VIS OUT: 43

MD: 10,392'  
TVD: 7,382.32'  
INC: 91.08°  
AZM: 90.97°  
VS: 2,992.71'

WOB: 22klbs  
RPM: 65  
SPM: 204  
SPP: 4,890psi

MD: 10,487'  
TVD: 7,381'  
INC: 90.51°  
AZM: 91.06°  
VS: 3,087.68'

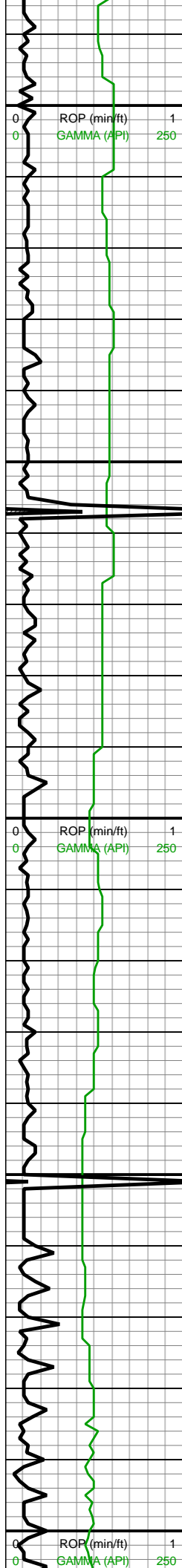
MD: 10,582'  
TVD: 7,380.59'  
INC: 89.98°  
AZM: 90.8°



dk gy, frm, brit, mod fis sb  
blky-blky ctngs, slty tex,  
mod calc wi brn mrly  
resdl; CHK (40%): dk gy  
wi rr-occ f wh chky incl &  
foram & chky intbds, frm,  
brit, mod fis ang-sb  
blky-blky ctngs, sl slty tex,  
rr bent, rr-occ wh forams,  
tr fos frags, tr vf pyr

10400-10500 MRLST  
(75%): dk gy-dk gyshbn-v  
dk gy, frm, brit, mod fis sb  
blky-blky ctngs, slty tex,  
mod calc wi brn mrly  
resdl; CHK (25%): dk gy  
wi rr-occ f wh chky incl &  
foram & chky intbds, frm,  
brit, mod fis ang-sb  
blky-blky ctngs, sl slty tex,  
rr bent, rr-occ wh forams,  
tr fos frags, tr vf pyr

10500-10600 MRLST  
(70%): dk gy-dk gyshbn,  
frm-brit, l-mod fis sb  
rd-sb blky ctngs, slty tex,  
rr vf pyr, mod calc wi brn  
mrly resdl; CHK (30%):  
med gy-dk gy wi f wh chky  
& foram incl thru. frm. brit.



VS: 3,182.66'

WOB: 41klbs  
RPM: 65  
SPM: 202  
SPP: 5,390psi

10,590  
10,600  
10,610  
10,620  
10,630  
10,640  
10,650  
10,660

MD: 10,677'  
TVD: 7,380.59'  
INC: 90.02°  
AZM: 90.36°  
VS: 3,277.66'

10,670  
10,680  
10,690  
10,700

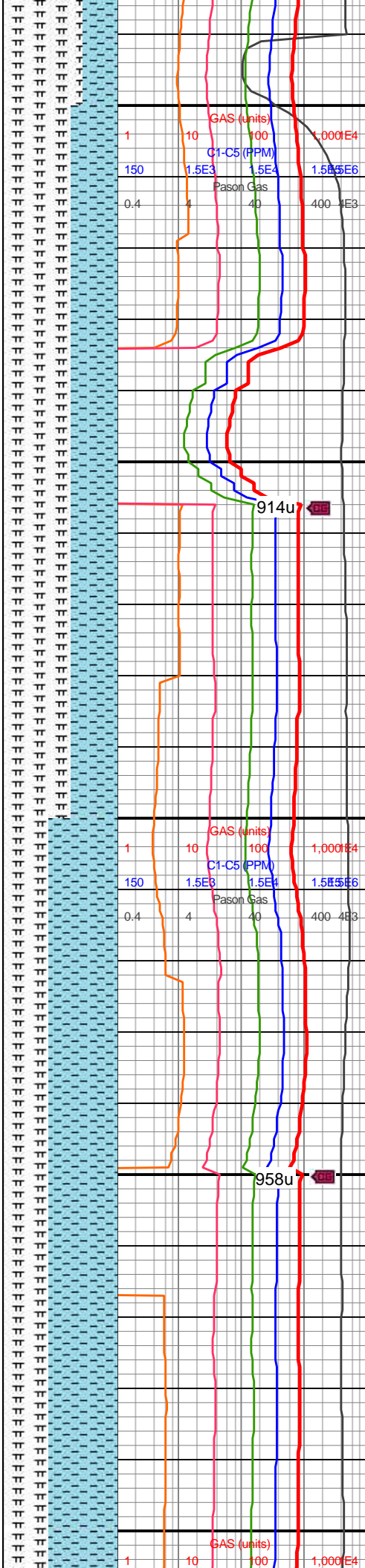
MW IN: 9.85  
VIS IN: 43  
MW OUT: 9.8  
VIS OUT: 43

10,710  
10,720  
10,730  
10,740  
10,750  
10,760

MD: 10,771'  
TVD: 7,380.12'  
INC: 90.55°  
AZM: 90.09°  
VS: 3,371.66'

10,770  
10,780  
10,790  
10,800

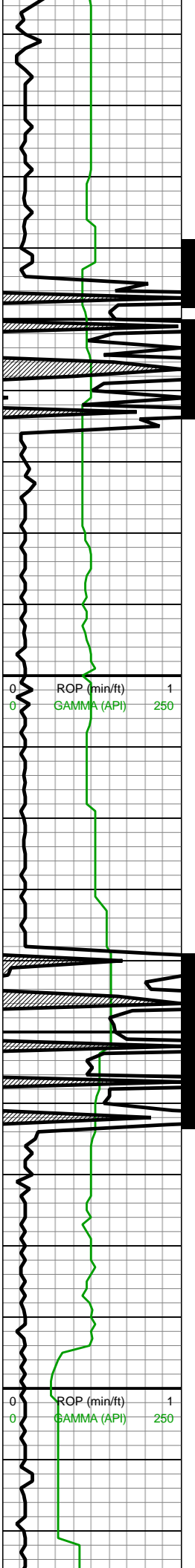
WOB: 34klbs  
RPM: 65  
SPM: 204  
SPP: 5,430psi



mod fis ang-sb blkly-blky  
ctngs, sl slty tex, rr-occ  
wh forams, tr vf pyr, hi  
calc

10600-10700 MRLST  
(60%): dk gy-dk gyshbn,  
frm-brit, l-mod fis sb  
rd-sb blkly-blky ctngs, slty  
tex, rr vf pyr, rr tn bent,  
mod calc; CHK (40%):  
med gy-dk gy, frm, brit,  
mod fis ang-sb blkly-blky  
ctngs, sl slty tex, rr-occ  
wh forams & vf-f chky incl,  
tr fos frags, tr vf pyr, hi  
calc

10700-10800 CHK  
(60%): med gy-dk gy, frm,  
brit, mod fis ang-sb  
blkly-blky ctngs, sl slty tex,  
rr-occ wh forams & vf-f  
chky incl, tr fos frags, tr vf  
pyr, hi calc; MRLST  
(40%): dk gy-dk gyshbn,  
frm-brit, l-mod fis sb  
rd-sb blkly-blky ctngs, slty  
tex, rr vf pyr, rr tn bent,  
mod calc wi brn mrly  
resdl



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  
10,960  
10,970  
10,980  
10,990  
11,000  
11,010  
11,020

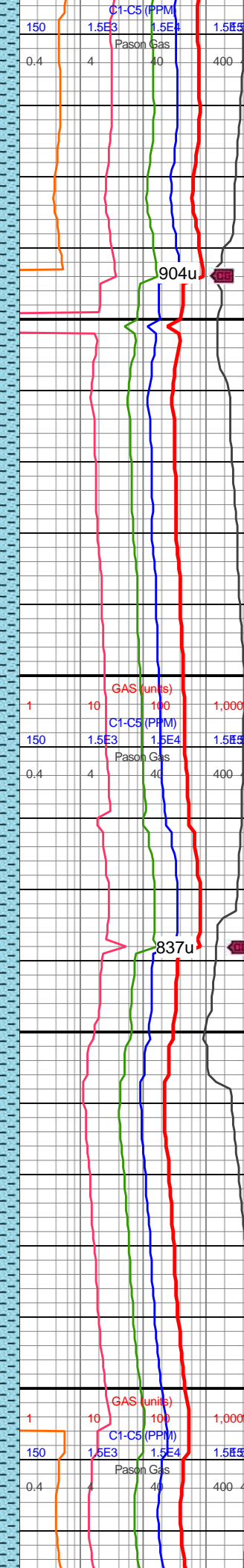
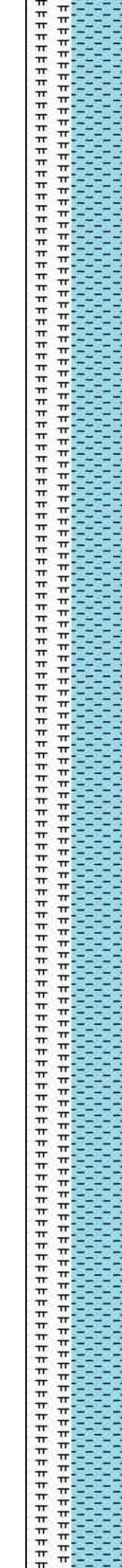
MD: 10,866'  
TVD: 7,378.92'  
INC: 90.9°  
AZM: 90.27°  
VS: 3,466.65'

MW IN: 9.85  
VIS IN: 45  
MW OUT: 9.8  
VIS OUT: 42

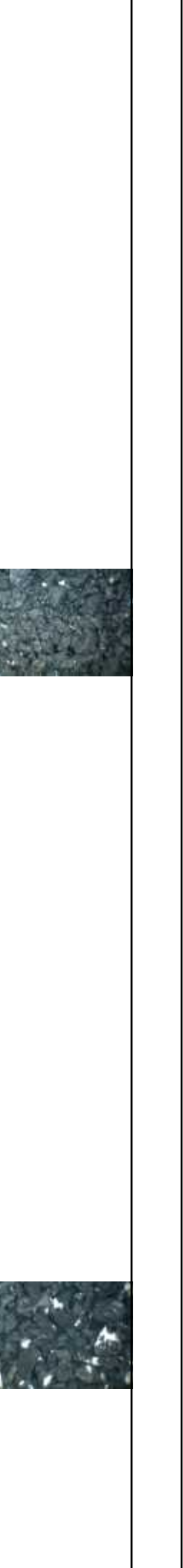
MD: 10,960'  
TVD: 7,377.7'  
INC: 90.59°  
AZM: 90.18°  
VS: 3,560.64'

MW IN: 9.8+  
VIS IN: 48  
MW OUT: 9.8+  
VIS OUT: 44

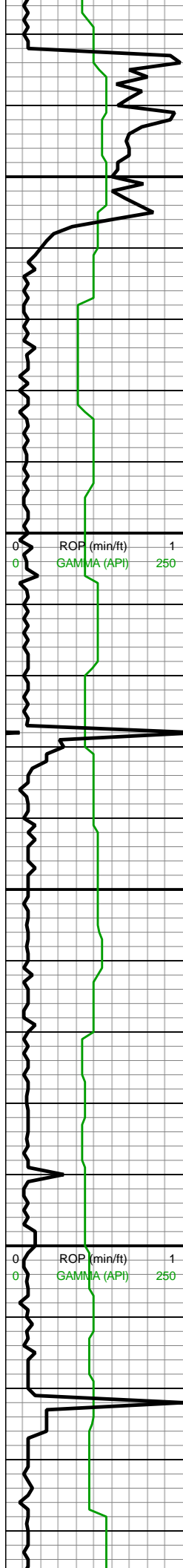
WOB: 38klbs  
RPM: 65  
SPM: 202  
SPP: 5,329psi



150 1.5E3 1.5E4 1.5E6  
0.4 4 40 400 4E3  
C1-C5 (PPM)  
Pason Gas  
904u  
10800-10900 CHK  
(60%): lt gy-med gy, frm,  
brit, mod fis ang-sb  
blky-blky ctngs, sl slty tex,  
occ-com wh sp forams, tr  
fos frags, tr vf pyr, hi calc;  
MRLST (40%): dk gy-dk  
gyshbn, frm-brit, l-mod fis  
sb rd-sb blky-blky ctngs,  
slty tex, rr vf pyr, rr tn bent  
mod calc wi brn mrly  
resdl  
10900-11000 CHK  
(60%): lt gy-med gy, frm,  
brit, mod fis ang-sb  
blky-blky ctngs, sl slty tex,  
occ-com wh sp forams, tr  
fos frags, tr vf pyr, hi calc;  
MRLST (40%): dk gy-dk  
gyshbn, frm-brit, l-mod fis  
sb rd-sb blky-blky ctngs,  
slty tex, rr vf pyr, rr tn bent  
mod calc wi brn mrly  
resdl  
150 1.5E3 1.5E4 1.5E6  
0.4 4 40 400 4E3  
C1-C5 (PPM)  
Pason Gas  
837u  
150 1.5E3 1.5E4 1.5E6  
0.4 4 40 400 4E3  
C1-C5 (PPM)  
Pason Gas  
1 10 100 1,000 1E4  
1 10 100 1,000 1E4  
GAS (units)







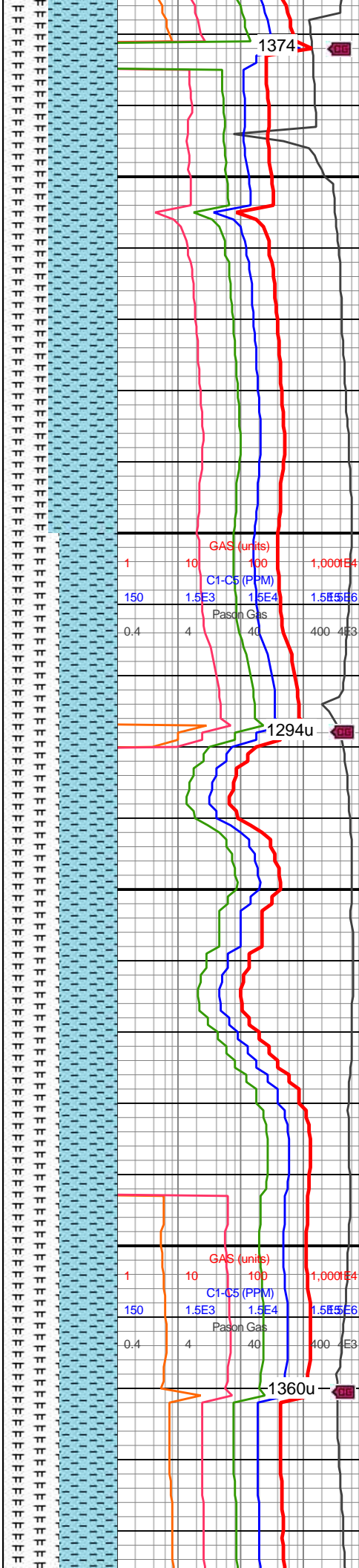
MD: 11,055'  
TVD: 7,378.32'  
INC: 88.66°  
AZM: 90.8°  
VS: 3,655.63'

MD: 11,149'  
TVD: 7,381.17'  
INC: 87.87°  
AZM: 89.74°  
VS: 3,749.58'

MW IN: 9.8+  
VIS IN: 48  
MW OUT: 9.8  
VIS OUT: 45

WOB: 34klbs  
RPM: 65  
SPM: 202  
SPP: 5,250psi

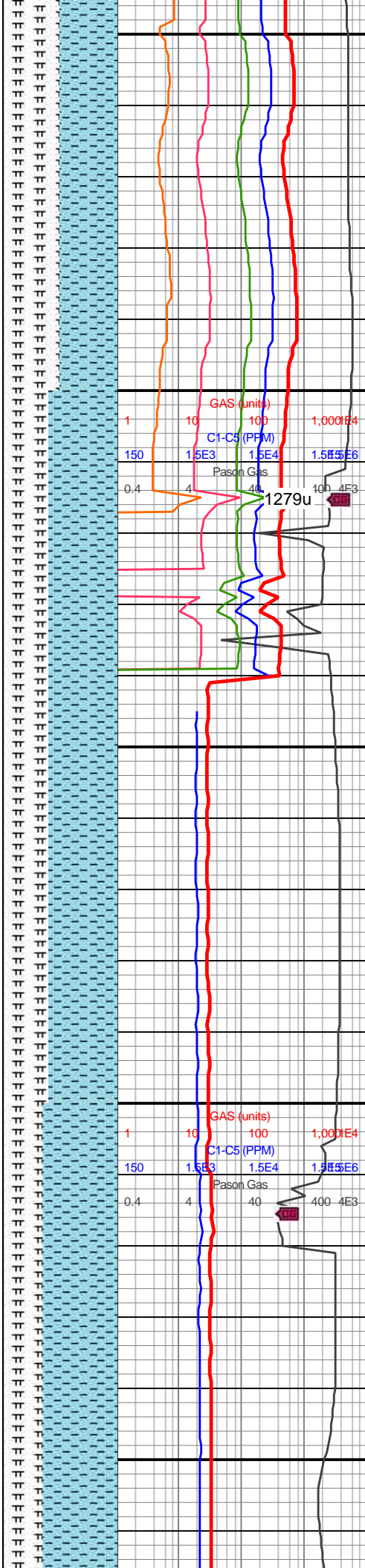
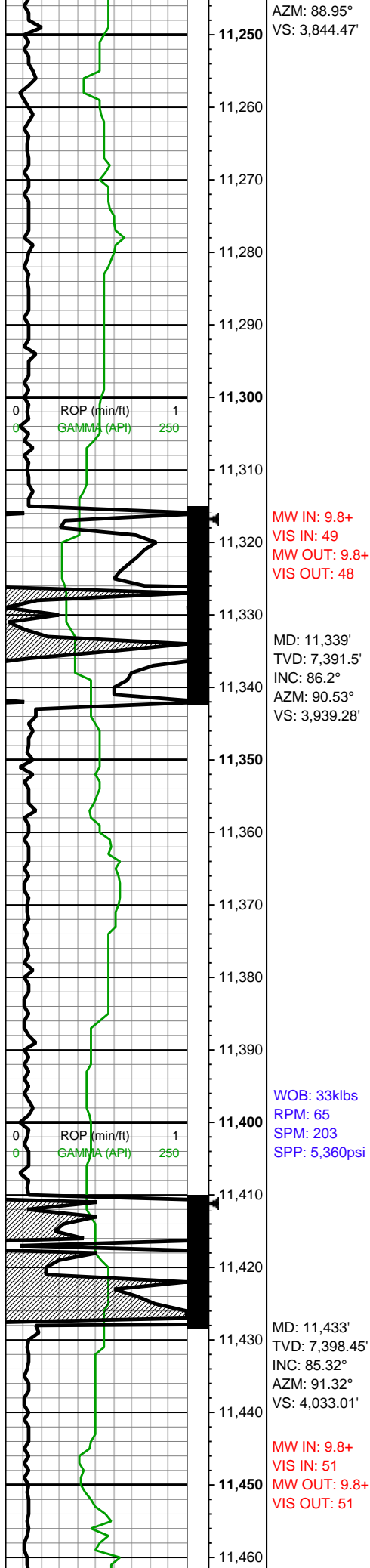
MD: 11,244'  
TVD: 7,385.64'  
INC: 86.73°



11000-11100 CHK  
(60%): lt gy-med gy, frm,  
brit, mod fis ang-sb  
blky-blky ctngs, sl slty tex,  
occ-com wh sp forams, tr  
fos frags, tr vf pyr, hi calc;  
MRLST (40%): dk gy-dk  
gyshbn, frm-brit, l-mod fis  
sb rd-sb blky-blky ctngs,  
slty tex, rr vf pyr, rr tn bent  
mod calc wi brn mrly  
resdl

11100-11200 CHK (50%)  
med gyshbn-lt gy, mot,  
sb blky wi occ ply, v chky  
tex, v sft-sl frm, scat-com  
inoc fos frags, occ-com  
wh sp forams, tr-rr pyr, v  
calc; MRLST (50%)  
med-dk gry wi sme lt gy,  
sb-blky, sl lam-rr  
micmica, tr free o, calc,  
sme scat cal

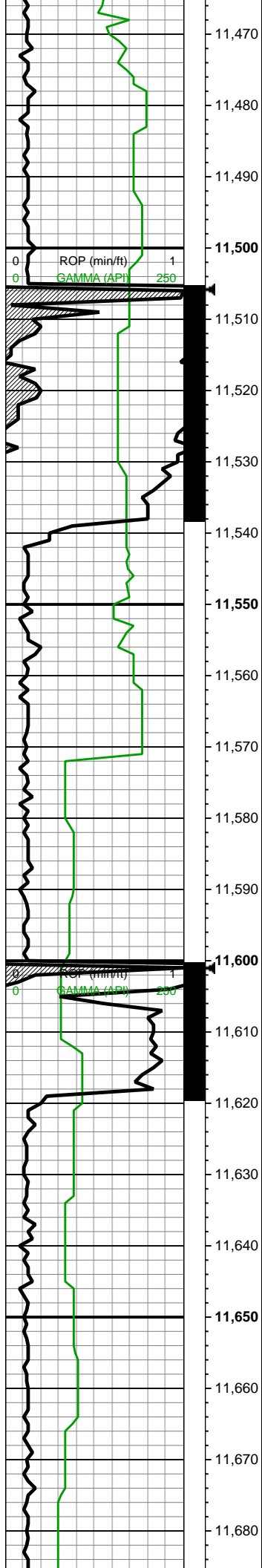




11200-11300 CHK (50%)  
med gyshbn-lt gy, mot,  
sb blkly wi occ plty, v chky  
tex, v sft-sl frm, scat-com  
inoc fos frags,occ-com  
wh sp forams, tr-rr pyr, v  
calc; MRLST (50%)  
med-dk gry wi sme lt gy,  
sb-blky, sl lam-rr  
micmica, tr free o, calc,  
sme scat cal

11300-11400 CHK (60%)  
med gyshbn-lt gy, mot,  
sb blkly wi occ plty, v chky  
tex, v sft-sl frm, scat-com  
inoc fos frags,occ-com  
wh sp forams, tr-rr pyr, v  
calc; MRLST (40%)  
med-dk gry wi sme lt gy,  
sb-blky, sl lam-rr  
micmica, tr free o, calc,  
sme scat cal

11400-11500 CHK (65%)

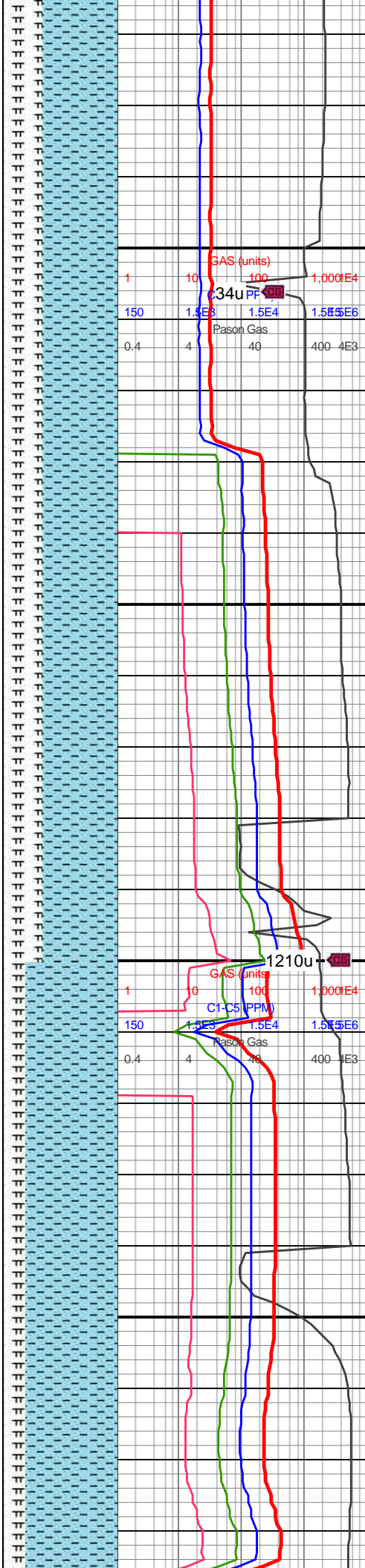


MW IN: 9.8+  
VIS IN: 46  
MW OUT: 9.8+  
VIS OUT: 51

MD: 11,528'  
TVD: 7,404.09'  
INC: 87.87°  
AZM: 93.08°  
VS: 4,127.75'

WOB: 15klbs  
RPM: 0  
SPM: 204  
SPP: 4,760psi

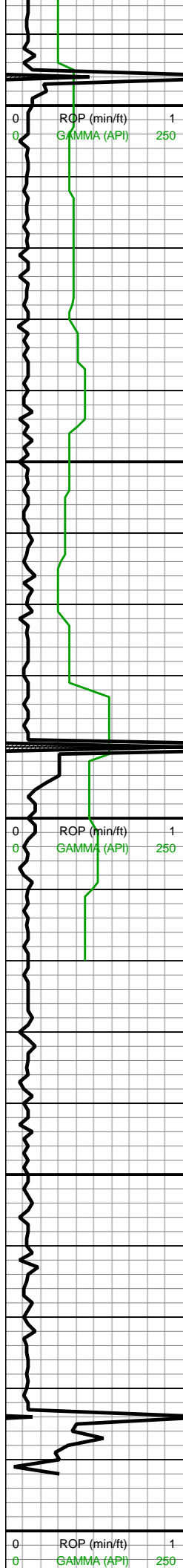
MD: 11,623'  
TVD: 7,405.07'  
INC: 90.95°  
AZM: 93.79°  
VS: 4,222.56'



11400-11500 CHK (65%)  
med gyshbn-lt gy, mot,  
sb blkly wi occ plty, v chky  
tex, v sft-sl frm, scat-com  
inoc fos frags,occ-com  
wh sp forams, tr-rr pyr, v  
calc; MRLST (35%)  
med-dk gry wi sme lt gy,  
sb-blky, sl lam-rr  
micmica, tr free o, calc,  
sme scat cal

11500-11600 CHK (65%)  
med gyshbn-lt gy, mot,  
sb blkly wi occ plty, v chky  
tex, v sft-sl frm, scat-com  
inoc fos frags,occ-com  
wh sp forams, tr-rr pyr, v  
calc; MRLST (35%)  
med-dk gry wi sme lt gy,  
sb-blky, sl lam-rr  
micmica, tr free o, calc,  
sme scat cal

11600-11700 CHK  
(80%): med gy-lt gy, sme  
offwht, tr lt gyshbn, sm  
chky tex, frm-brit, sb  
blkly-blky, hi calc, scat  
inoc fos, tr dissn pyr



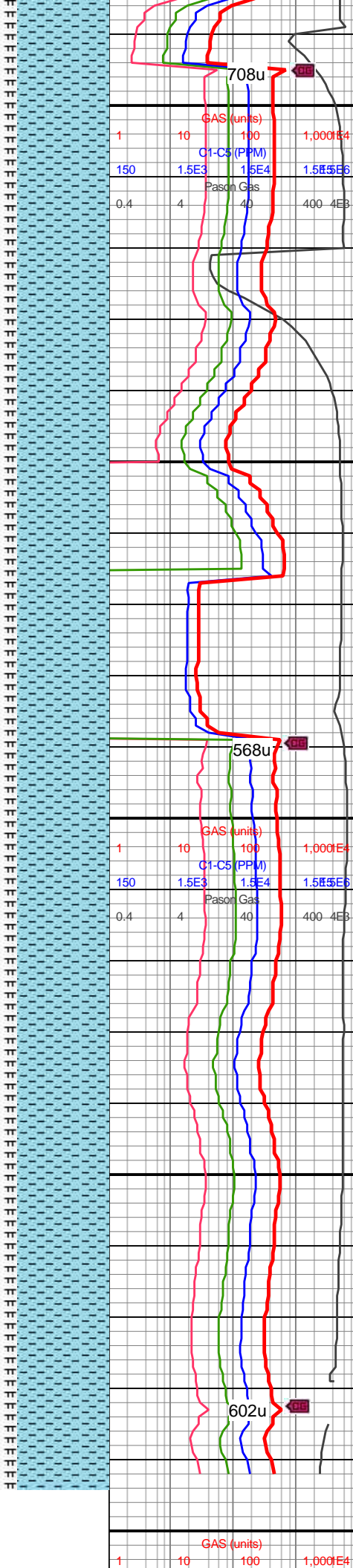
MD: 11,717'  
TVD: 7,403.95'  
INC: 90.42°  
AZM: 93.35°  
VS: 4,316.36'

WOB: 36klbs  
RPM: 64  
SPM: 202  
SPP: 5,450psi

MD: 11,820'  
TVD: 7,402.68'  
INC: 90.99°  
AZM: 93.61°  
VS: 4,419.15'

MW IN: 9.8  
VIS IN: 48  
MW OUT: 9.8  
VIS OUT: 45

Projection to bit:  
MD: 11,892'  
TVD: 7,401.44'  
INC: 90.99°  
AZM: 93.61°



inc 100, tr diss pyrc  
cls; MRLST (20%): dk  
gy-med gy, mot, tab-blky,  
sm-sl slty arg tex, sb  
frm-frm, brit ip, v calc

11700-11800 CHK  
(80%): med gy-lt gy, sme  
offwht, tr lt gyshbn, sm  
chky tex, frm-brit, sb  
blky-blky, hi calc, scat  
inoc fos, tr diss pyrc  
cls; MRLST (20%): dk  
gy-med gy, mot, tab-blky,  
sm-sl slty arg tex, sb  
frm-frm, brit ip, v calc

11800-11892 CHK  
(80%): med gy-lt gy, sme  
offwht, tr lt gyshbn, sm  
chky tex, frm-brit, sb  
blky-blky, hi calc, scat  
inoc fos, tr diss pyrc  
cls; MRLST (20%): dk  
gy-med gy, mot, tab-blky,  
sm-sl slty arg tex, sb  
frm-frm, brit ip, v calc



VS: 4,490.99'

- 11,910

TD Well 02:34  
hrs 9/25/18 @  
11892'MD

- 11,920

- 11,930

- 11,940

**- 11,950**

- 11,960

- 11,970

11 020

C1-C5 (PPM)

150
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1.5E3

1.5E4

1.5E5E6

Pason Gas

0.4

4

40

400 4E3