



# RESERVOIR GROUP

Scale: 5" / 100'  
Measured Depth Log

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

**Location** Sec. 25 T1N R66W

**State** Colorado

**County** Weld

**Country** USA

**Rig Number** Ensign 140

**API Number** 05123461270000

**AFE #** 16190874

**Geographic Region** Rockies

**Field** Wattenberg

**Spud Date** 8/29/2018

**Drilling Completed** 8/31/2018

**Surface Coordinates** Lat/Long: 40.018702/-104.733854  
SHL: Sec: 25 Twp: 1N 66W  
Footage: 1343 FSL 310 FWL

**Bottom Hole Coordinates** Proposed BHL: Sec: 25 Twp: 1N 66W  
Footages: 1230 FFSLL 460 FFELL

**Ground Elevation** 5,086'

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

**Logged Interval** 6,800' To 12,024'

**Total Depth** 12,024'

**Formation** Codell

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

## Operator

**Company** Crestone Peak Resources

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

## 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:** Brian Ferwerda / Nicholas Watkins

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

**Equipment:** ML-533

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

**Service Start Date:** 8/30/2018

## Rock Types

UNKNOWN	DOLOMITE	SHALE GRAY	TILL
ANHYDRITE	CHERT	SHALE COLORED	BENTONITE
GYPSUM	COAL	SILTSTONE	TUFF
SALT	MARLSTONE	SANDSTONE	IGNEOUS
SIDERITE or LIMONITE	CHALK	CONGLOMERATE	METAMORPHIC
LIMESTONE	SHALE	BRECCIA	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

### Argillaceous

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

### Glauconite

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

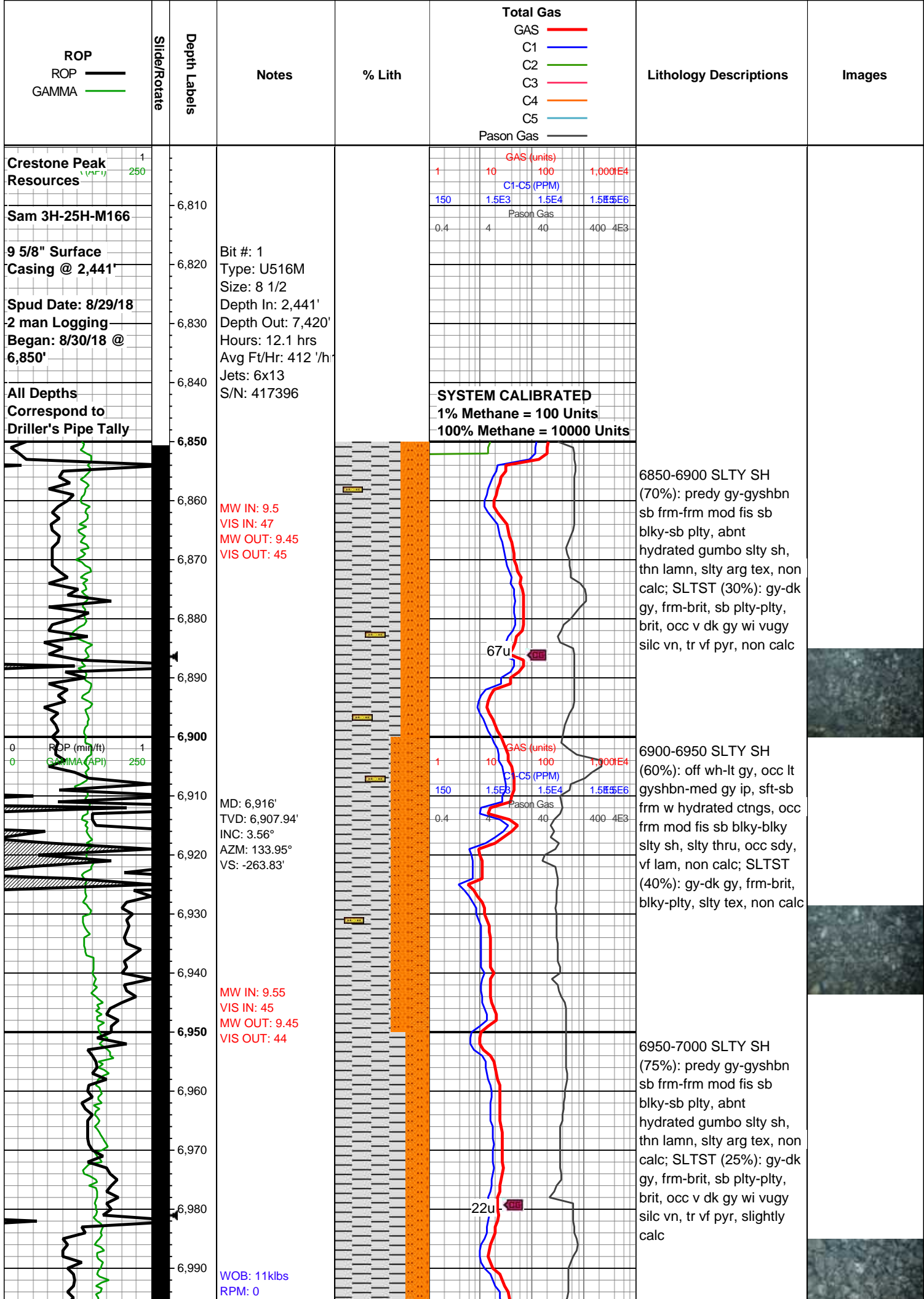
BOUNDSTONE  
CHALKY  
CRYPTOXLN  
EARTHY  
FINELYXLN  
GRAINSTONE

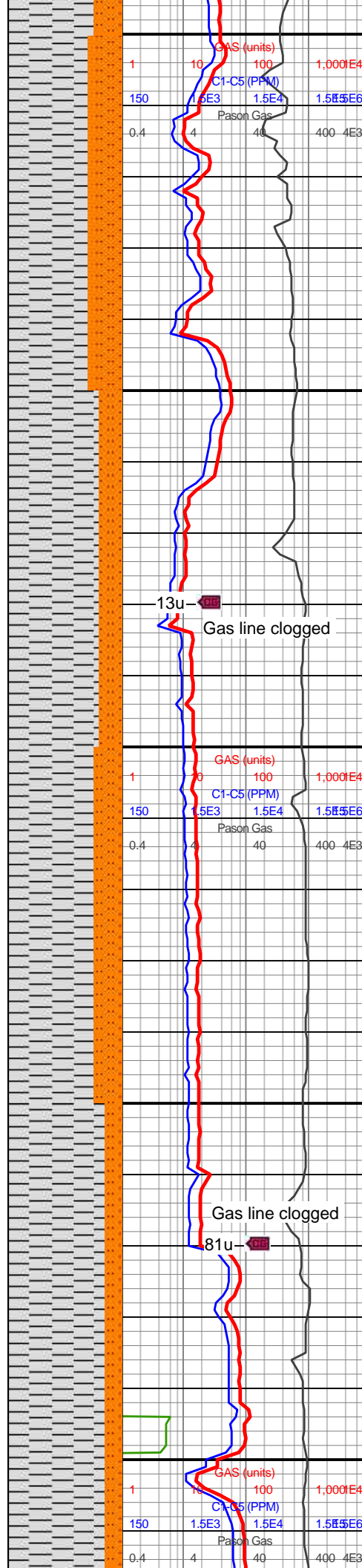
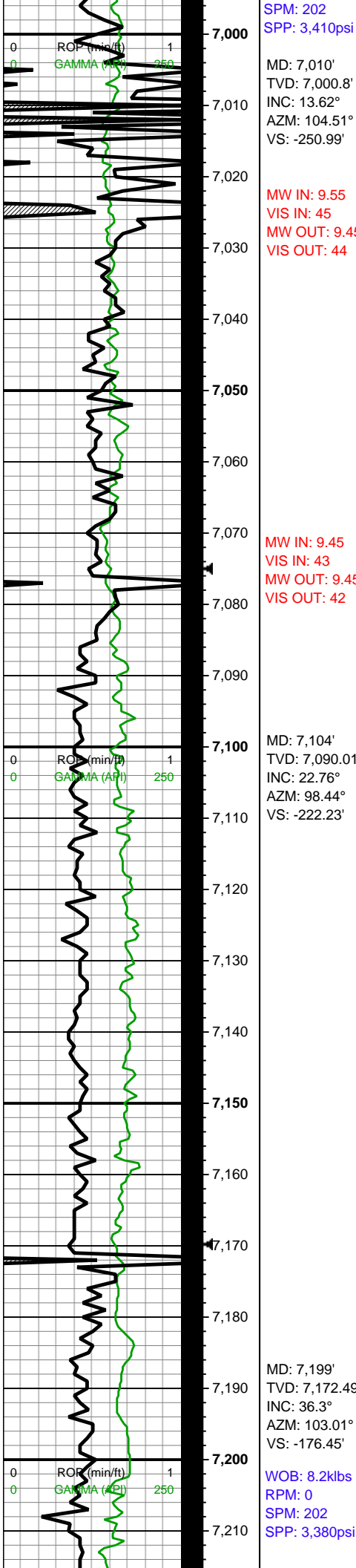
LITHOGRAPHIC  
MICROXLN  
MUDSTONE  
PACKSTONE  
WACKESTONE

### Sorting

MODERATE  
POOR  
WELL







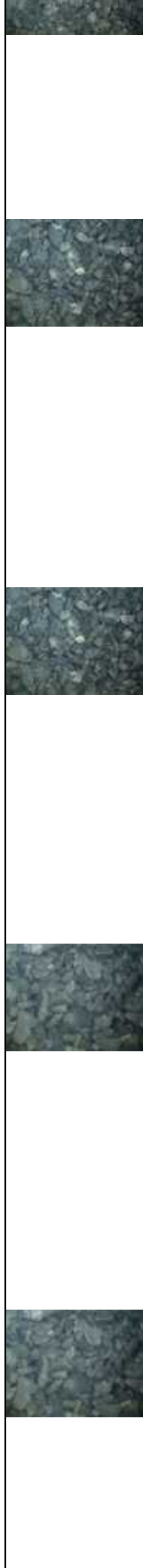
7000-7050 SLTY SH  
(70%): predy lt gy sft-sb  
frm w hydrated water  
solu ctngs intbdd wi frm  
mod fis sb blkyl-blky med  
gy slty sh, non calc;  
SLTST (30%): gy-dk gy,  
frm-brit, blkyl-plty, slty tex,  
non calc"

7050-7100 SLTY SH  
(70%): predy lt gy sft-sb  
frm w hydrated water  
solu ctngs intbdd wi frm  
mod fis sb blkyl-blky med  
gy slty sh, non calc;  
SLTST (30%): gy-dk gy,  
frm-brit, blkyl-plty, slty tex,  
slightly calc"

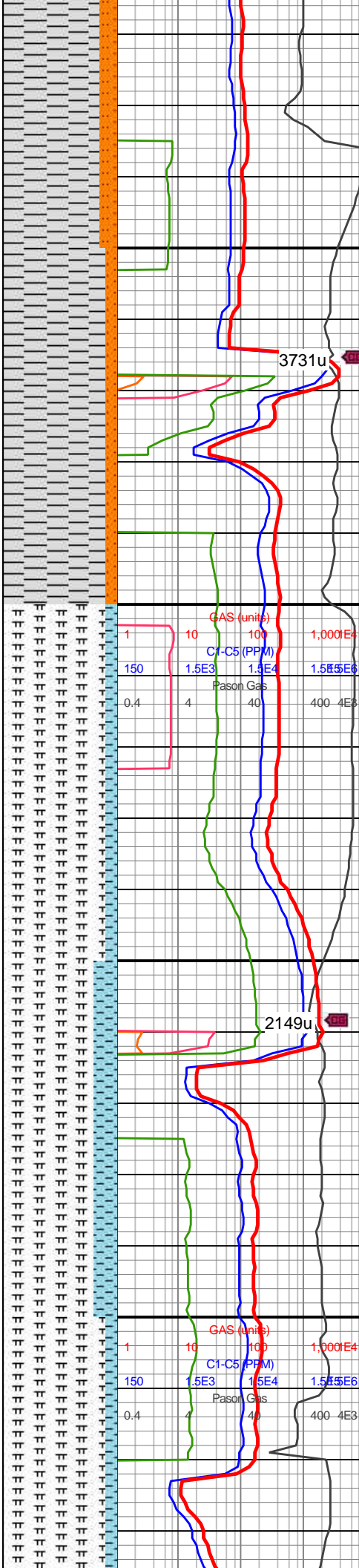
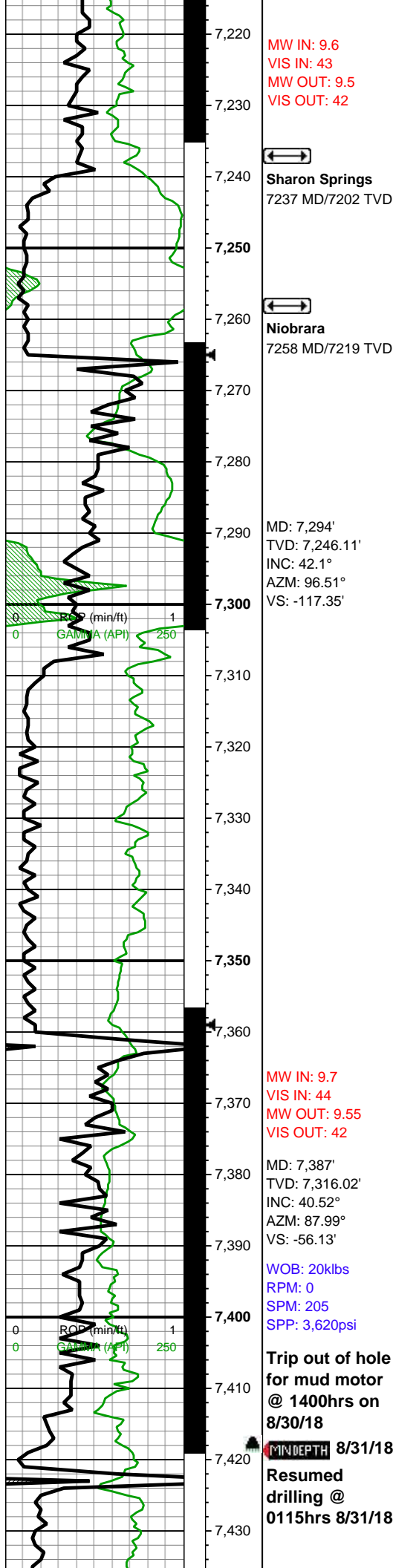
7100-7150 SLTY SH  
(70%): predy lt gy sft-sb  
frm w hydrated water  
solu ctngs intbdd wi frm  
mod fis sb blkyl-blky med  
gy slty sh, non calc;  
SLTST (30%): gy-dk gy,  
frm-brit, blkyl-plty, slty tex,  
non calc"

7150-7200 SLTY SH  
(85%): off wh-lt gy sft-sb  
frm w hydrated water  
solu ctngs intbdd wi frm  
mod fis sb blkyl-blky med  
gy slty sh, non calc;  
SLTST (15%): gy-dk gy,  
frm-brit, blkyl-plty, slty tex,  
slightly calc

7200-7250 SLTY SH  
(85%): off wh-lt gy sft-sb  
frm w hydrated water  
solu ctngs intbdd wi frm  
mod fis sb blkyl-blky med







mod ls ss blkly blkly med  
gy slty sh, non calc;  
SLTST (15%): gy-dk gy,  
frm-brit, blkly-plty, slty tex,  
slightly calc

7250-7300 MRLST  
(90%): dk gy-v dk gy,  
frm-brit, med-hi fis blkly  
ctngs, rr vf pyr, mod calc;  
CHK (10%): lt gy-gy, sb  
frm-frm, rd-sb rd-sb blkly  
l-mod fis ctngs, f wh chky  
incl, rr vf pyr, hi calc

7300-7350 MRLST  
(90%): gyshbn-dk gy, sb  
frm-frm, brit ip, mod fis  
sb blkly-blky-tab ctngs,  
slty thru, sm arg-slty tex,  
tr o stn, occ thn chky  
lamn, mod calc wi brn  
mrly resdl; CHK (10%):  
med gy-dk gy wi com f wh  
chky lamn, frm-brit, mod  
fis sb ang-sb blkly ctngs,  
tr vf pyr, hi calc

7350-7400 MRLST  
(80%): gyshbn-dk gy wi  
occ yel o stn, sb frm-frm,  
brit ip, mod fis sb  
blkly-blky-tab ctngs, slty  
thru, sm arg-slty tex, occ  
thn chky lamn, mod calc  
wi brn mrly resdl; CHK  
(20%): med gy-dk gy wi  
com f wh chky lamn,  
frm-brit, mod fis sb  
ang-sb blkly ctngs, tr vf  
pyr, hi calc

7400-7450 MRLST  
(90%): med gy-dk gy-occ  
blk, frm-hd-brit, med fis  
sb blkly-blky, sm-sl slty  
tex, mod calc; CHK



Type: U516M  
Size: 8 1/2  
Depth In: 7,420'  
Depth Out: 12,024'  
Hours: 15.7 hrs  
Avg Ft/Hr: 293 'h'  
Jets: 6x13  
S/N: 41854

MD: 7,482'  
TVD: 7,386.4'  
INC: 43.86°  
AZM: 85.7°  
VS: 7.56'



**B Chalk**  
7487 MD/7390 TVD

MW IN: 9.9  
VIS IN: 51  
MW OUT: 9.9  
VIS OUT: 44



**B Marl**  
7524 MD/7415 TVD

MD: 7,577'  
TVD: 7,448'  
INC: 55.15°  
AZM: 88.78°  
VS: 79.6'



**C Chalk**  
7591 MD/7456 TVD

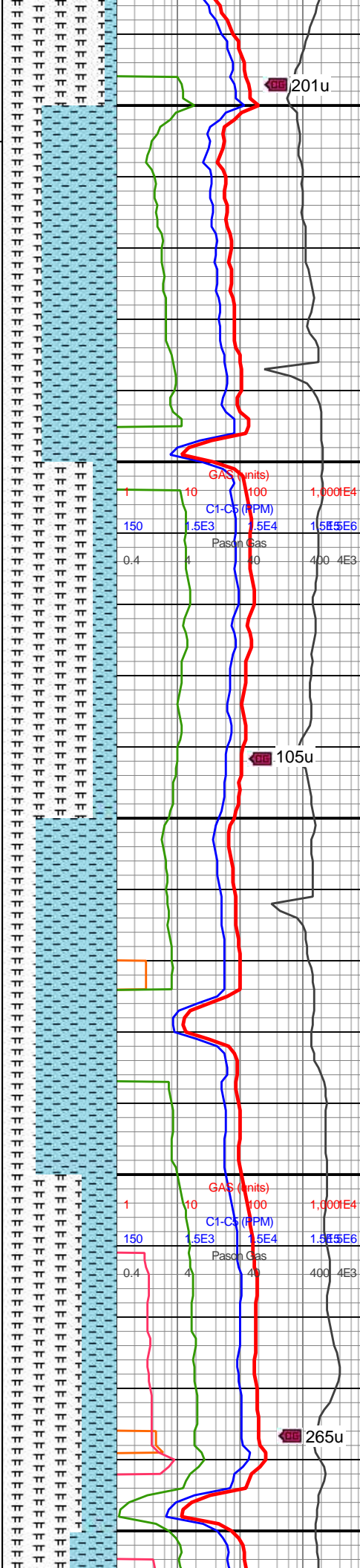
WOB: 23.2klbs  
RPM: 0  
SPM: 188  
SPP: 3,449psi



**C Marl**  
7646 MD/7483 TVD

MW IN: 9.8+

VIS IN: 47



(10%): lt gy-dk gy, chky  
tex, sb frm-frm-brit, hi fis,  
blky-sb plty-plty, chky tex,  
hi calc, tr mic fos frags

7450-7500 CHK (65%): lt  
gyshbn, occ lt gy-dk gy wi  
occ chky incl, sft-sb  
frm-frm-brit, sb blky, tr vf  
pyr, scat mic fos frags,  
occ lse cal, hi calc;  
MRLST (35%): predy dk  
gy, occ med-dk gyshbn,  
frm-hd-brit, sm sl slty tex,  
rgh tex ip, mod calc

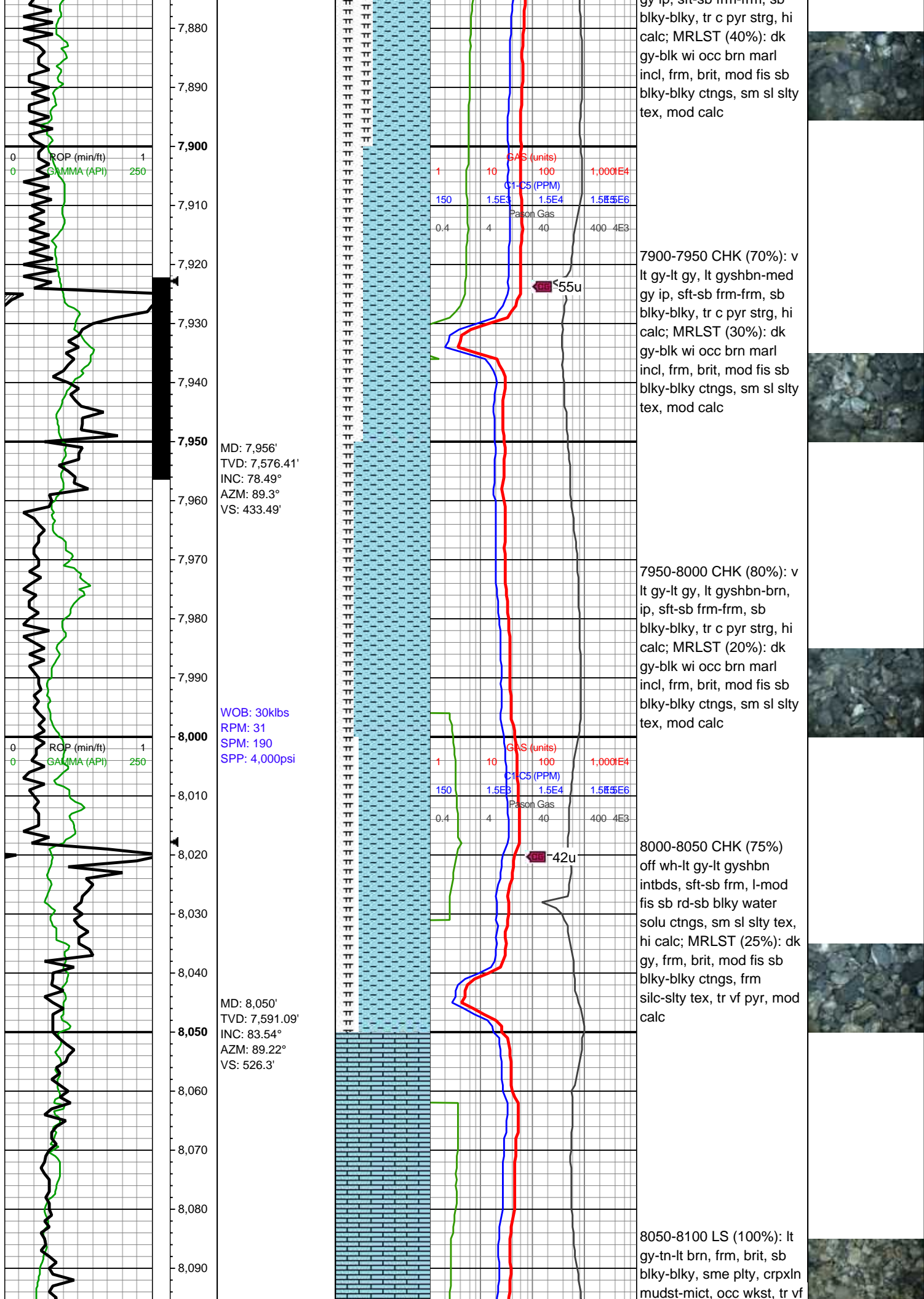
7500-7550 MRLST  
(80%): pred med-sme dk  
gry, blky-sb blky, brit-sl  
hrd, hi calc, chky lam wi  
sme chky tex; CHK  
(20%): pred lt med  
gy-sme occ lt brn, sl  
sft-frm, blky, v-hi calc, v  
rr-occ pyrc nod wi sme tr  
pyr

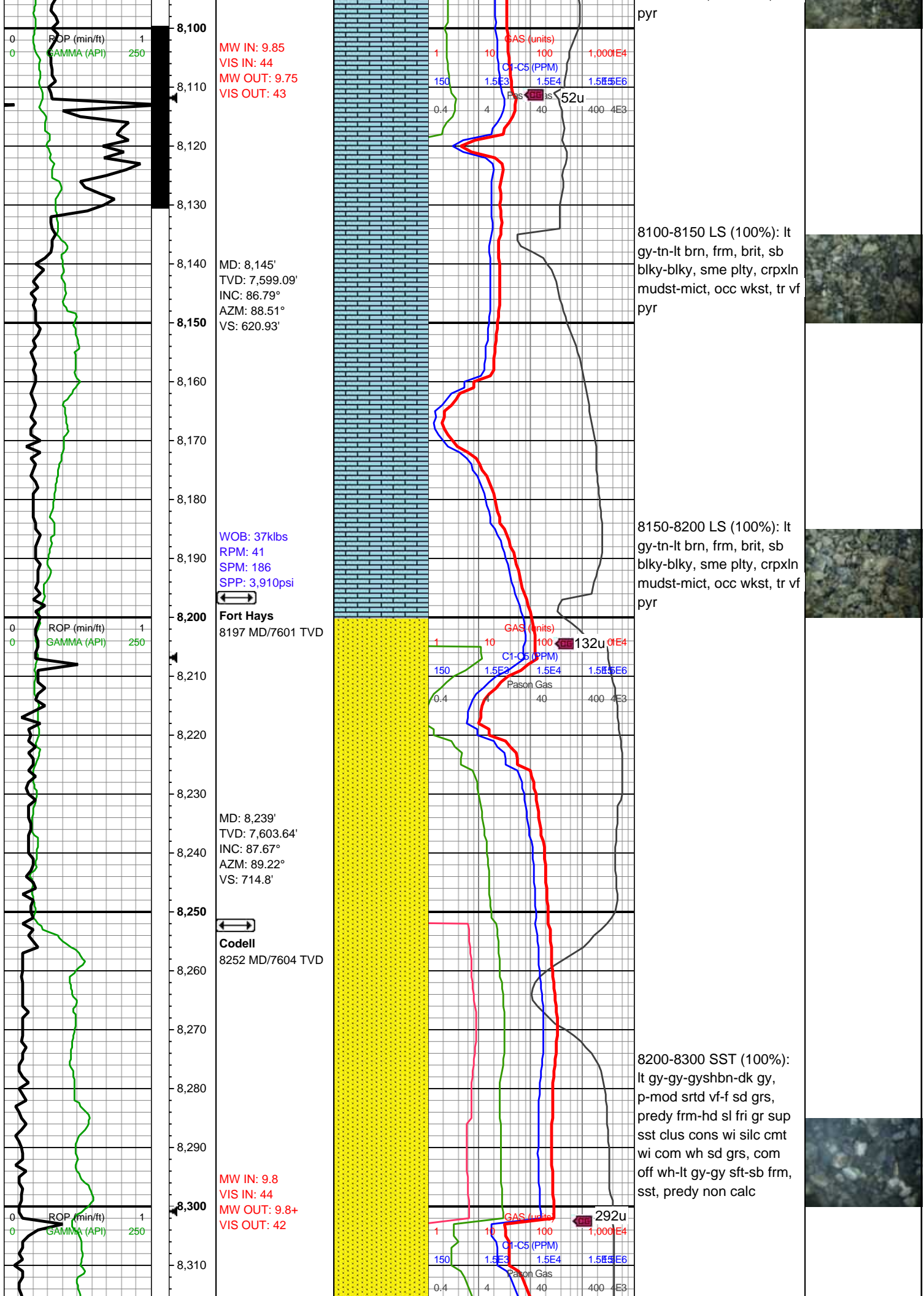
7550-7600 CHK (70%): lt  
gy-gyshbn-med gy wi occ  
f wh chky incl thru, frm, sb  
blky-blky ctngs, chky tex,  
rr-tr foram, tr fos frags, v  
calc; MRLST (30%): med  
gyshbn-dk gy, frm-brit,  
blky-sb blky, sm arg-sl  
slty tex, mod calc

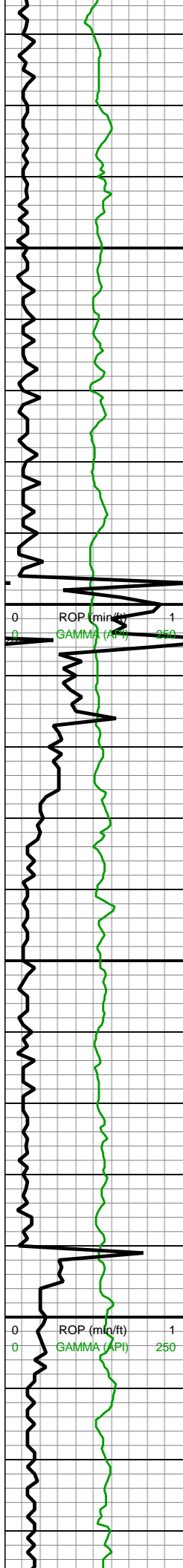
7600-7650 MRLST  
(70%): dk gy-dk gyshbn,  
sl hd-v frm, mod fis, sb  
blky-tab ctngs, sm arg  
tex, mod calc, tr pp mic  
pyr; CHK (30%): med  
brn-gyshbn, frm-sft, mod  
fis, tab-sb blky, tr free  
CHK, v calc











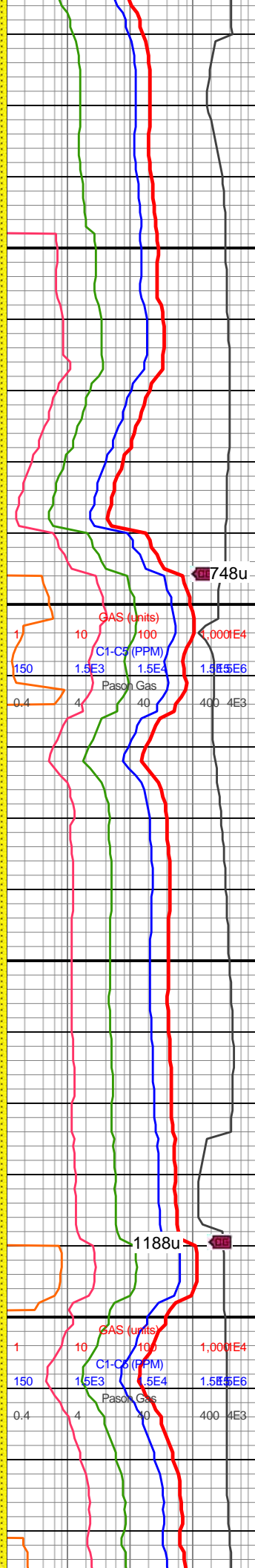
8,320  
8,330  
8,340  
8,350  
8,360  
8,370  
8,380  
8,390  
8,400  
8,410  
8,420  
8,430  
8,440  
8,450  
8,460  
8,470  
8,480  
8,490  
8,500  
8,510  
8,520  
8,530

MD: 8,333'  
TVD: 7,607.21'  
INC: 87.98°  
AZM: 88.25°  
VS: 808.71'

WOB: 31klbs  
RPM: 0  
SPM: 186  
SPP: 3,330psi

MD: 8,428'  
TVD: 7,608.88'  
INC: 90°  
AZM: 88.42°  
VS: 903.66'

MD: 8,522'  
TVD: 7,608.12'  
INC: 90.92°  
AZM: 88.42°  
VS: 997.62'

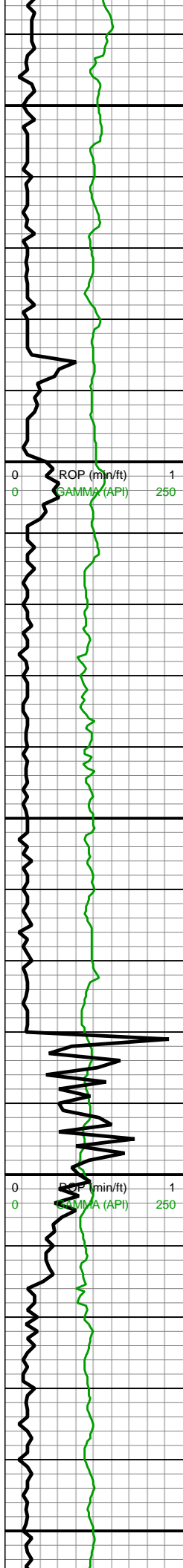


8300-8400 SST (100%):  
lt gy-gy-gyshbn-dk gy,  
p-mod srted vf-f sd grs,  
predy frm-hd sl fri gr sup  
sst clus cons wi silc cmt  
wi com wh sd grs, com  
off wh-lt gy-gy sft-sb frm,  
sst, predy non calc

8400-8500 SST (100%):  
lt gy-gy-gyshbn-dk gy,  
p-mod srted vf-f sd grs,  
predy frm-hd sl fri gr sup  
sst clus cons wi silc cmt  
wi com wh sd grs, com  
off wh-lt gy-gy sft-sb frm,  
sst, predy non calc





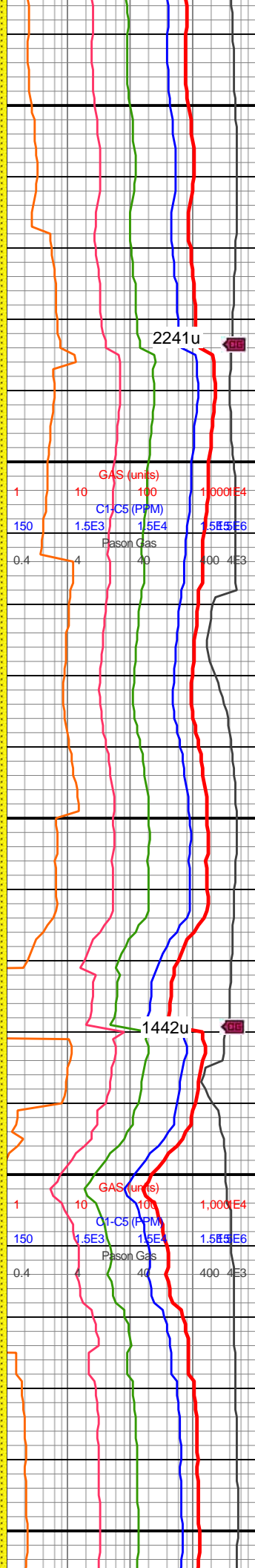


MW IN: 9.85  
VIS IN: 44  
MW OUT: 9.85  
VIS OUT: 42

WOB: 43klbs  
RPM: 0  
SPM: 184  
SPP: 3,610psi

MD: 8,617'  
TVD: 7,606.34'  
INC: 91.23°  
AZM: 87.81°  
VS: 1,092.56'

MD: 8,711'  
TVD: 7,605.01'  
INC: 90.4°  
AZM: 87.55°  
VS: 1,186.47'

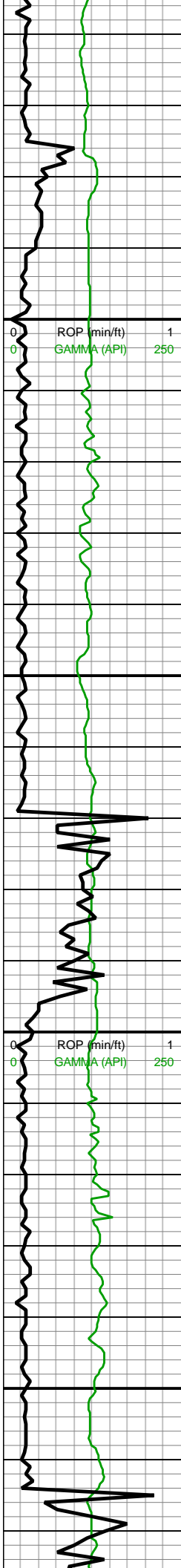


8500-8600 SST (100%):  
lt gy-gy-gyshbn-dk gy,  
p-mod srtd vf-f sd grs,  
predy frm-hd sl fri gr sup  
sst clus cons wi silc cmt  
wi com wh sd grs, com  
off wh-lt gy-gy sft-sb frm,  
sst, predy non calc

8600-8700 SST (100%):  
lt gy-gy-gyshbn-dk gy,  
p-mod srtd vf-f sd grs,  
predy frm-hd sl fri gr sup  
sst clus cons wi silc cmt  
wi com wh sd grs, com  
off wh-lt gy-gy sft-sb frm,  
sst, predy non calc





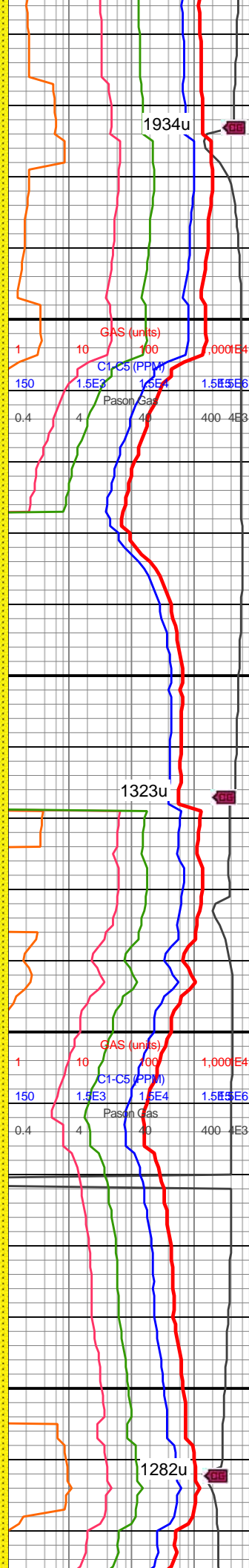


MW IN: 9.85  
VIS IN: 44  
MW OUT: 9.85  
VIS OUT: 43

WOB: 32klbs  
RPM: 60  
SPM: 185  
SPP: 4,100psi

MD: 8,805'  
TVD: 7,603.92'  
INC: 90.92°  
AZM: 87.19°  
VS: 1,280.37'

MD: 8,901'  
TVD: 7,603.89'  
INC: 89.12°  
AZM: 87.37°  
VS: 1,376.27'

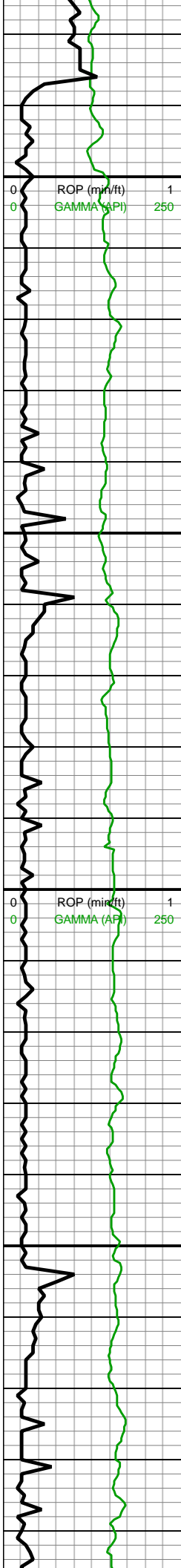


8700-8800 SST (100%):  
lt-dk gy, gyshbn ip, frm sli  
fri gr-mtx sup sst clus  
cons wi silc cmt, arg ip,  
mod srtd sb ang-sb rd-rd  
f sd grs, vf ip grdg to sltst,  
predy non calc, rr mod  
calc ip

8800-8900 SST (100%):  
off wh-lt gy, med gy-dk  
gy-dk gyshbn, mod srtd  
sb ang-sb rd-rd vf-f sd  
grs, frm sli fri gr sup sst  
clus cons wi silc cmt, arg  
ip, vf ip grdg to sltst,  
predy non calc, rr mod  
calc ip

8900-9000 SST (90%):  
lt-dk gy, gyshbn ip, frm sli  
fri ar-mtx sup sst clus



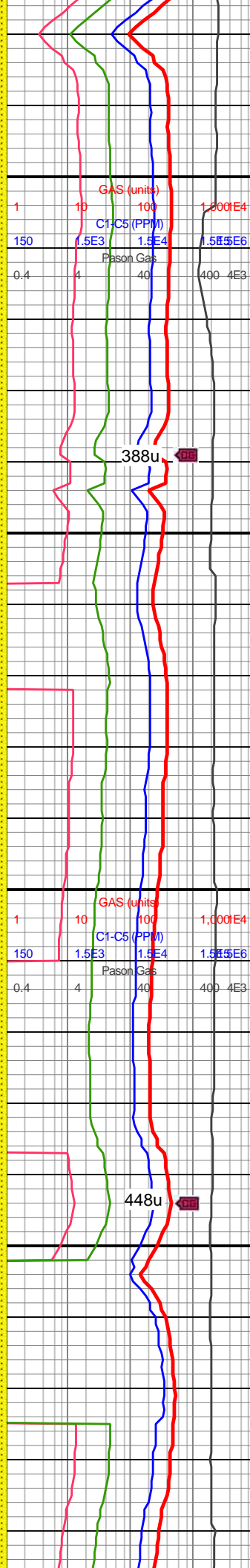


MD: 8,995'  
TVD: 7,606.05'  
INC: 88.24°  
AZM: 88.86°  
VS: 1,470.19'  
WOB: 32klbs  
RPM: 61  
SPM: 185  
SPP: 4,110psi

MW IN: 9.85  
VIS IN: 45  
MW OUT: 9.85  
VIS OUT: 43

MD: 9,090'  
TVD: 7,608.68'  
INC: 88.59°  
AZM: 88.6°  
VS: 1,565.14'

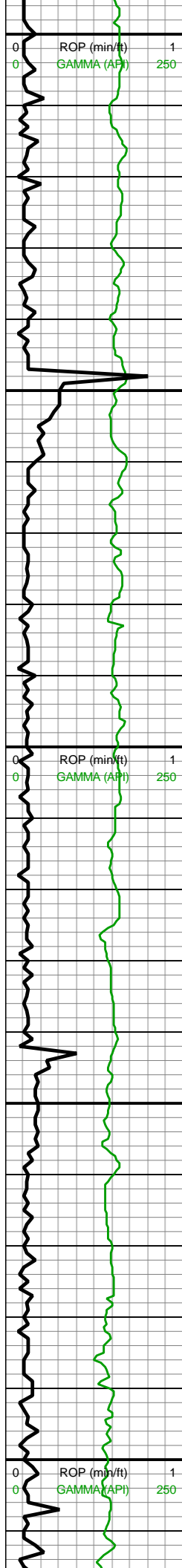
MD: 9,185'  
TVD: 7,610.8'  
INC: 88.86°  
AZM: 88.16°  
VS: 1,660.08'



cons wi silc cmt, arg ip,  
mod srtd sb ang-sb rd-rd  
f sd grs, vf ip grdg to sltst,  
predy non calc, rr mod  
calc ip; SLTST (10%): dk  
gy, frm, brit, silc, sdy ip,  
non calc

9000-9100 SST (80%):  
off wh-lt gy, med gy-dk  
gy-dk gyshbn, mod srtd  
sb ang-sb rd-rd vf-f sd  
grs, frm sli fri gr sup sst  
clus cons wi silc cmt, arg  
ip, vf ip grdg to sltst,  
predy non calc, rr mod  
calc ip; SLTST (20%):  
gy-dk gy, frm, brit, mod fis  
silc ctngs, slty tex, non  
calc

9100-9200 SST (80%):  
off wh-lt gy, med gy-dk  
gy-dk gyshbn, mod srtd  
sb ang-sb rd-rd vf-f sd  
grs, frm sli fri gr sup sst  
clus cons wi silc cmt, arg  
ip, vf ip grdg to sltst,  
predy non calc, rr mod  
calc ip; SLTST (20%):  
gy-dk gy, frm, brit, mod fis  
silc ctnas, slty tex, non



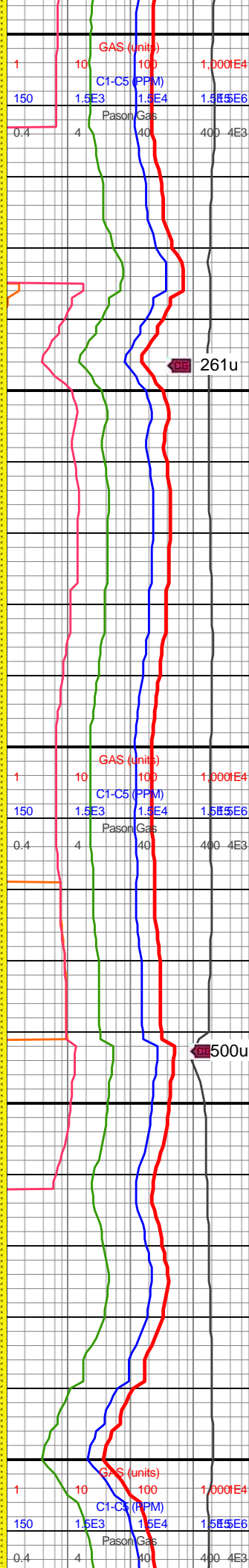
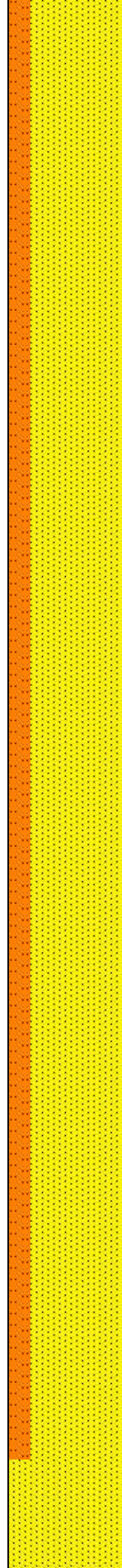
WOB: 30klbs  
RPM: 60  
SPM: 186  
SPP: 4,120psi

MW IN: 9.85  
VIS IN: 44  
MW OUT: 9.85  
VIS OUT: 42

MD: 9,279'  
TVD: 7,612.2'  
INC: 89.43°  
AZM: 88.07°  
VS: 1,754.02'

MD: 9,375'  
TVD: 7,612.94'  
INC: 89.69°  
AZM: 87.99°  
VS: 1,849.96'

WOB: 33klbs  
RPM: 70  
SPM: 185  
SPP: 4,270psi



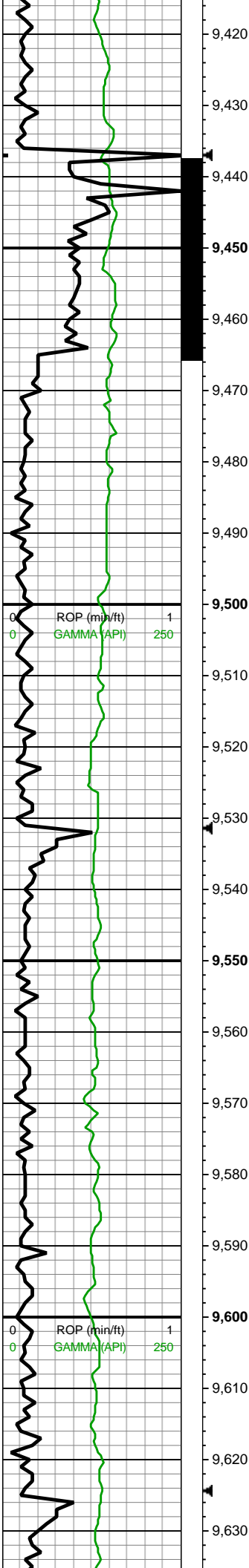
calc

9200-9300 SST (80%):  
off wh-lt gy, med gy-dk  
gy-dk gyshbn, mod srtd  
sb ang-sb rd-rd vf-f sd  
grs, frm sli fri gr sup sst  
clus cons wi silc cmt, arg  
ip, vf ip grdg to sltst,  
predy non calc, rr mod  
calc ip; SLTST (20%):  
gy-dk gy, frm, brit, mod fis  
silc ctngs, slty tex, non  
calc

9300-9400 SST (80%):  
off wh-lt gy, med gy-dk  
gy-dk gyshbn, mod srtd  
sb ang-sb rd-rd vf-f sd  
grs, frm sli fri gr sup sst  
clus cons wi silc cmt, arg  
ip, vf ip grdg to sltst,  
predy non calc, rr mod  
calc ip; SLTST (20%):  
gy-dk gy, frm, brit, mod fis  
silc ctngs, slty tex, non  
calc



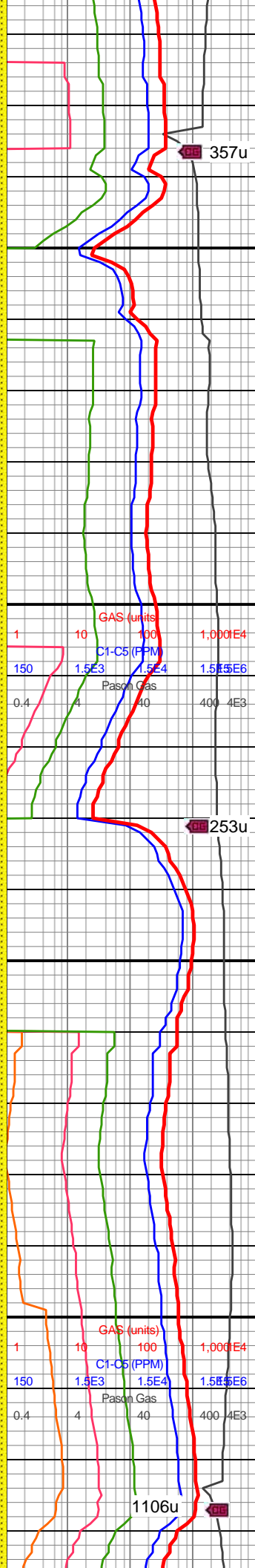




MD: 9,469'  
TVD: 7,613.26'  
INC: 89.91°  
AZM: 90.45°  
VS: 1,943.95'

MD: 9,564'  
TVD: 7,613.16'  
INC: 90.22°  
AZM: 89.74°  
VS: 2,038.95'

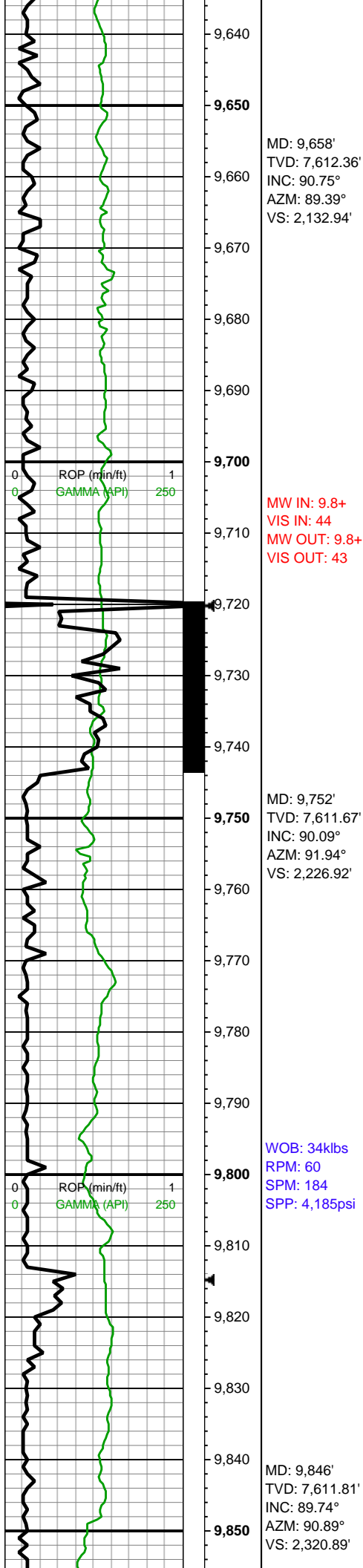
WOB: 32klbs  
RPM: 60  
SPM: 186  
SPP: 4,275psi



9400-9500 SST (100%)  
gy-dk gry-med-gy, mod  
srted sb ang-sb rnd, firm,  
frm sli fri gr sup sst clus  
cons wi silc cmt, arg ip, vf  
ip grdg to sltst, predy rr  
mod calc ip

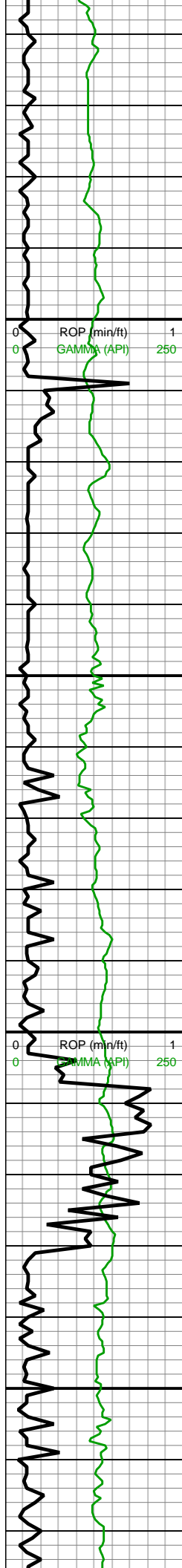
9500-9600 SST (100%)  
gy-dk gry-med-gy, mod  
srted sb ang-sb rnd, firm,  
frm sli fri gr sup sst clus  
cons wi silc cmt, arg ip, vf  
ip grdg to sltst, predy rr  
mod calc ip





9600-9700 SST (100%)  
gy-dk gry-med-gy, mod  
srted sb ang-sb rnd, firm,  
frm sli fri gr sup sst clus  
cons wi silc cmt, arg ip, vf  
ip grdg to sltst, predy rr  
mod calc ip

9700-9800 SST (100%)  
gy-dk gry-med-gy, mod  
srted sb ang-sb rnd, firm,  
frm sli fri gr sup sst clus  
cons wi silc cmt, arg ip, vf  
ip grdg to sltst, predy rr  
mod calc ip



9,860  
9,870  
9,880  
9,890  
9,900  
9,910  
9,920  
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

MW IN: 9.8+  
VIS IN: 44  
MW OUT: 9.8+  
VIS OUT: 42

MD: 9,941'  
TVD: 7,612.36'  
INC: 89.6°  
AZM: 90.09°  
VS: 2,415.88'

WOB: 25klbs  
RPM: 0  
SPM: 188  
SPP: 3,420psi

MW IN: 9.8+  
VIS IN: 45  
MW OUT: 9.8+  
VIS OUT: 44

MD: 10,036'  
TVD: 7,612.95'  
INC: 89.69°  
AZM: 92.29°  
VS: 2,510.85'

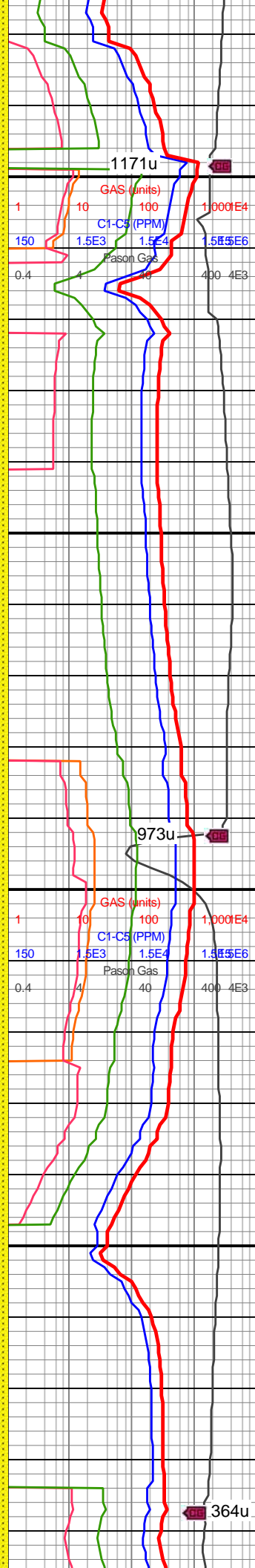
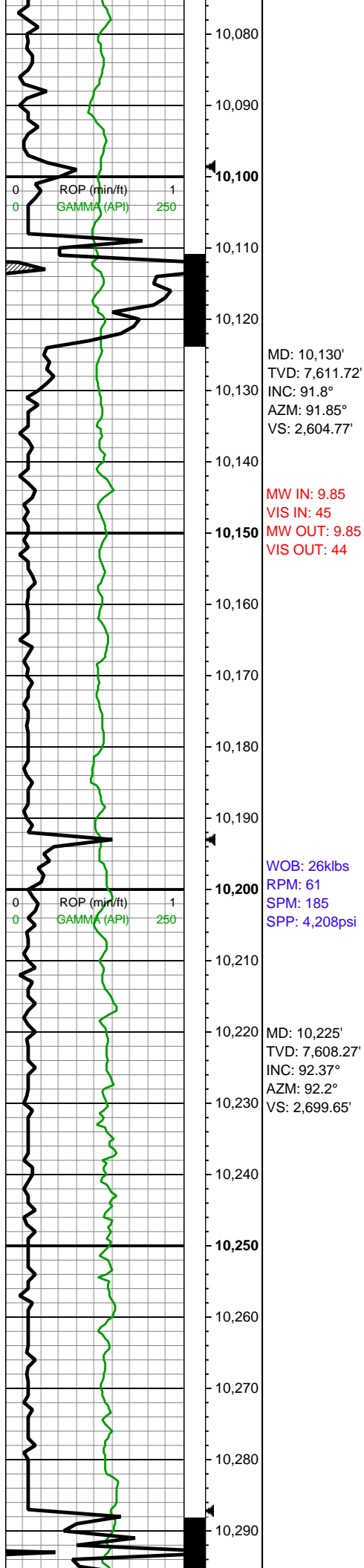


9800-9900 SST (80%):  
off wh-lt gy, med gy-dk  
gy-dk gyshbn, mod srtd  
sb ang-sb rd-rd vf-f sd  
grs, frm sli fri gr sup sst  
clus cons wi silc cmt, arg  
ip, vf ip grdg to sltst,  
predy non calc, rr mod  
calc ip; SLTST (20%):  
gy-dk gy, frm, brit, mod fis  
silc ctngs, slty tex, non  
calc

9900-10000 SST (80%):  
off wh-lt gy, med gy-dk  
gy-dk gyshbn, mod srtd  
sb ang-sb rd-rd vf-f sd  
grs, frm sli fri gr sup sst  
clus cons wi silc cmt, arg  
ip, vf ip grdg to sltst,  
predy non calc, rr mod  
calc ip; SLTST (20%):  
gy-dk gy, frm, brit, mod fis  
silc ctngs, slty tex, non  
calc

10000-10100 SST (80%):  
off wh-lt gy, med gy-dk  
gy-dk gyshbn, mod srtd  
sb ang-sb rd-rd vf-f sd  
grs, frm sli fri gr sup sst  
clus cons wi silc cmt, arg  
ip, vf ip grdg to sltst,  
predy non calc, rr mod  
calc ip; SLTST (20%):  
gy-dk gy, frm, brit, mod fis  
silc ctngs, slty tex, non  
calc





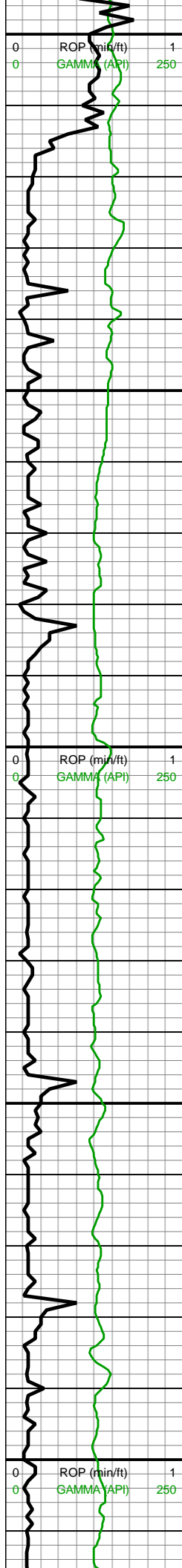
grs, frm sli fri gr sup sst  
clus cons wi silc cmt, arg  
ip, vf ip grd to sltst,  
predy non calc, rr mod  
calc ip; SLTST (20%):  
gy-dk gy, frm, brit, mod fis  
silc ctngs, slty tex, non  
calc

10100-10200 SST (80%):  
off wh-lt gy, med gy-dk  
gy-dk gyshbn, mod srtd  
sb ang-sb rd-rd vf-f sd  
grs, frm sli fri gr sup sst  
clus cons wi silc cmt, arg  
ip, vf ip grd to sltst,  
predy non calc, rr mod  
calc ip; SLTST (20%):  
gy-dk gy, frm, brit, mod fis  
silc ctngs, slty tex, non  
calc

10200-10300 SST (80%):  
off wh-lt gy, med gy-dk  
gy-dk gyshbn, mod srtd  
sb ang-sb rd-rd vf-f sd  
grs, frm sli fri gr sup sst  
clus cons wi silc cmt, arg  
ip, vf ip grd to sltst,  
predy non calc, rr mod  
calc ip; SLTST (20%):  
gy-dk gy, frm, brit, mod fis  
silc ctnas, slty tex, non





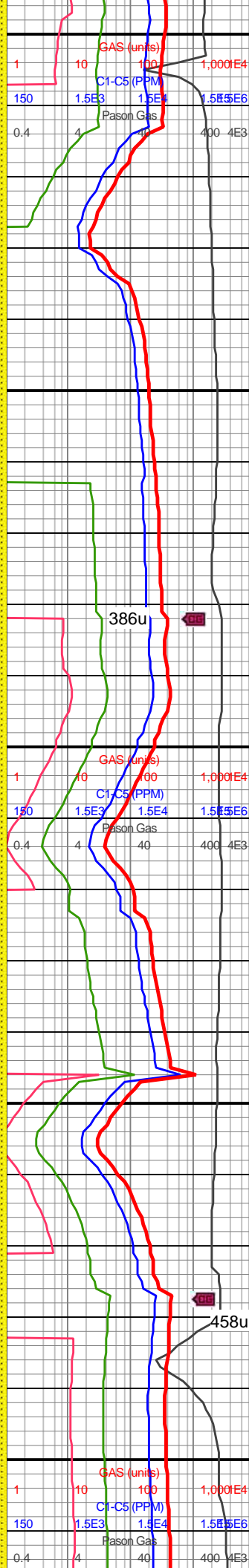


MD: 10,320'  
TVD: 7,605.36'  
INC: 91.14°  
AZM: 91.15°  
VS: 2,794.55'

WOB: 35klbs  
RPM: 60  
SPM: 184  
SPP: 4,540psi

MD: 10,415'  
TVD: 7,602.77'  
INC: 91.98°  
AZM: 90.62°  
VS: 2,889.5'

MD: 10,509'  
TVD: 7,599.27'  
INC: 92.29°  
AZM: 90.09°  
VS: 2,983.44'



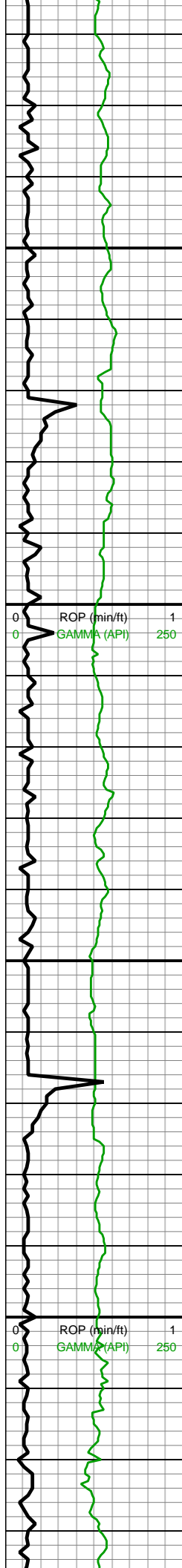
calc

10300-10400 SST (80%):  
off wh-lt gy, med gy-dk  
gy-dk gyshbn, mod srtd  
sb ang-sb rd-rd vf-f sd  
grs, frm sli fri gr sup sst  
clus cons wi silc cmt, arg  
ip, vf ip grdg to sltst,  
predy non calc, rr mod  
calc ip; SLTST (20%):  
gy-dk gy, frm, brit, mod fis  
silc ctngs, slty tex, non  
calc

10400-10500 SST (80%):  
off wh-lt gy, med gy-dk  
gy-dk gyshbn, mod srtd  
sb ang-sb rd-rd vf-f sd  
grs, frm sli fri gr sup sst  
clus cons wi silc cmt, arg  
ip, vf ip grdg to sltst,  
predy non calc, rr mod  
calc ip; SLTST (20%):  
gy-dk gy, frm, brit, mod fis  
silc ctngs, slty tex, non  
calc







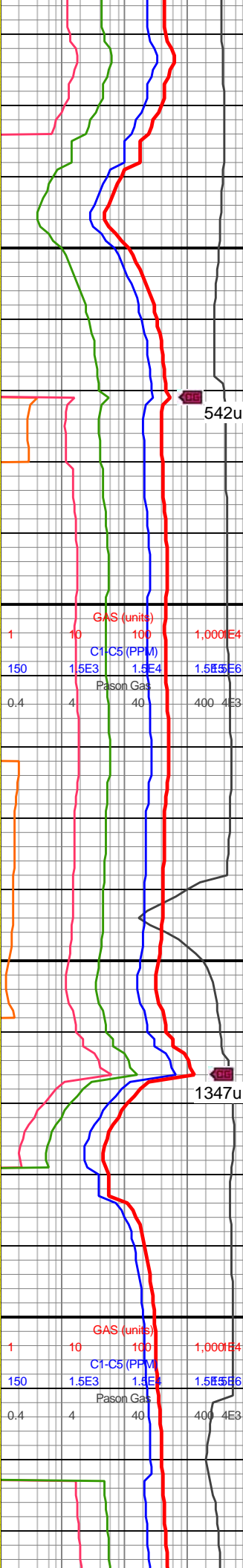
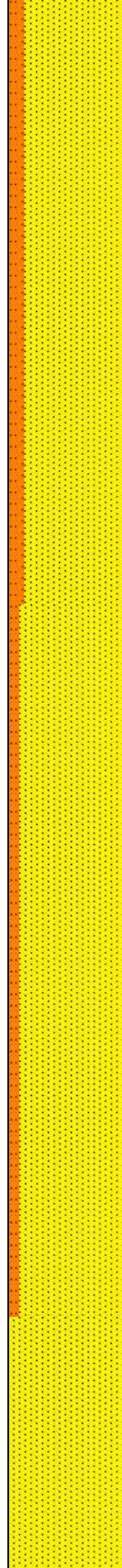
10,520  
10,530  
10,540  
10,550  
10,560  
10,570  
10,580  
10,590  
10,600  
10,610  
10,620  
10,630  
10,640  
10,650  
10,660  
10,670  
10,680  
10,690  
10,700  
10,710  
10,720  
10,730

WOB: 35.5klbs  
RPM: 61  
SPM: 184  
SPP: 4,538psi

MD: 10,604'  
TVD: 7,595.7'  
INC: 92.02°  
AZM: 88.95°  
VS: 3,078.36'

MW IN: 98+  
VIS IN: 44  
MW OUT: 9.9  
VIS OUT: 42

MD: 10,699'  
TVD: 7,592.17'  
INC: 92.24°  
AZM: 87.99°  
VS: 3,173.27'



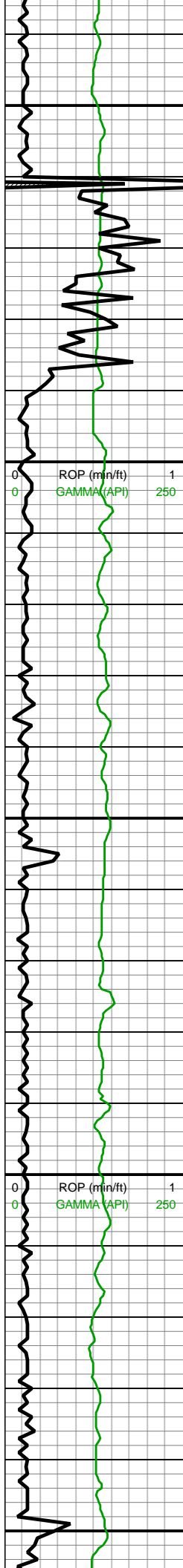
10500-10600 SST (85%):  
pred med gyshbn, occ lt  
gy-lt brn, sme red-brn,  
frm-v frm, blk, pred  
mod-w cons gr sup cls  
cons wi silc cmt, non  
calc, vf-f grnd, occ grdg to  
slt, com micmica, tr imbd  
pyr, scat sh frags; SLTST  
(15%): lt gy-med gy sb  
frm-frm silc-arg sltst, occ  
frm-brit silc sltst

542u

10600-10700 SST (90%):  
pred dk gy-dk gy brn wi f  
sb rd qtz sd gr incl, fri-sli  
fri gr sup shy ss clus  
cons wi arg & silc cmt,  
occ lt gy-gy mtx sup shy  
ss cons wi arg cmt, p  
srted vf-f sd grs, com  
uncons sd, non calc;  
SLTST (10%): lt gy-med  
gy sb frm-frm silc-arg  
sltst, occ frm-brit silc sltst

1347u





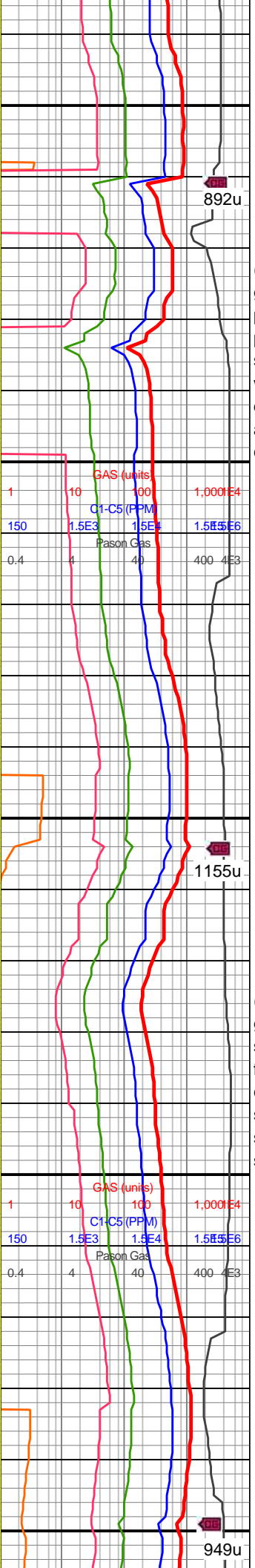
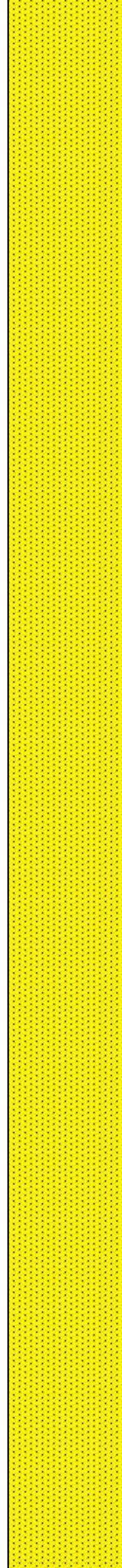
10,740  
10,750  
10,760  
10,770  
10,780  
10,790  
10,800  
10,810  
10,820  
10,830  
10,840  
10,850  
10,860  
10,870  
10,880  
10,890  
10,900  
10,910  
10,920  
10,930  
10,940  
10,950

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

MD: 10,794'  
TVD: 7,590.93'  
INC: 89.25°  
AZM: 89.13°  
VS: 3,268.22'

WOB: 33.2klbs  
RPM: 0  
SPM: 188  
SPP: 4,667psi

MD: 10,888'  
TVD: 7,591.98'  
INC: 89.47°  
AZM: 89.22°  
VS: 3,362.21'



10700-10800 SST  
(100%): off wh-lt  
gy-gy-gy-gyshbn-dk gy,  
p-mod srted vf-f sd grs,  
predy frm-hd sli fri gr sup  
sst clus cons wi silc cmt  
wi com wh sd grs, com  
off wh-lt gy-gy sft-sb frm v  
arg sst, predy non calc, sl  
calc ip

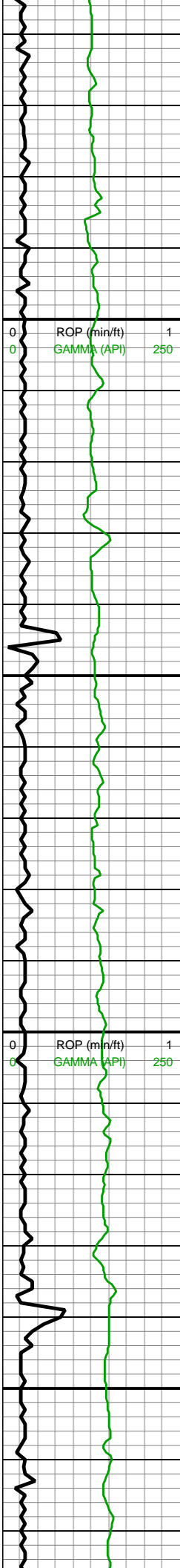
10800-10900 SST  
(100%): off wh-lt gy-dk  
gy-v dk gy, p-mod srted vf-f  
sd grs grdg to slt ip, sb  
frm-frm mtx sup sst clus  
cons wi arg cmt grdg to  
shy sst ip, gr sup sli fri gr  
sup ss-sltst clus cons wi  
silc cmt, non-mod calc



892u

1155u

949u



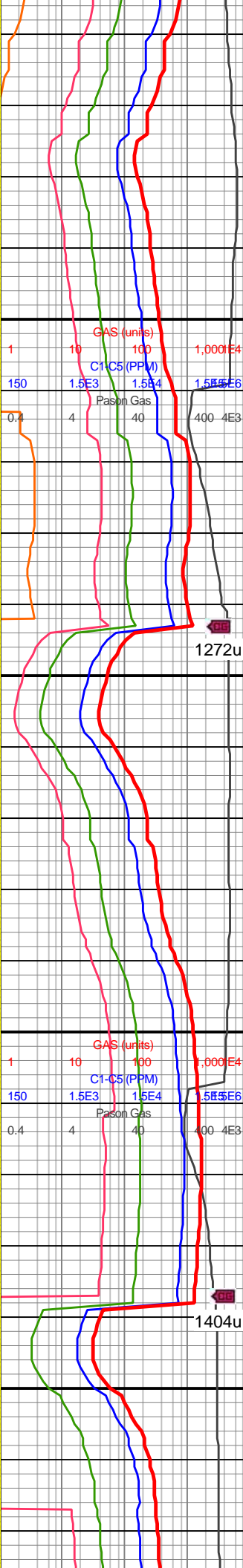
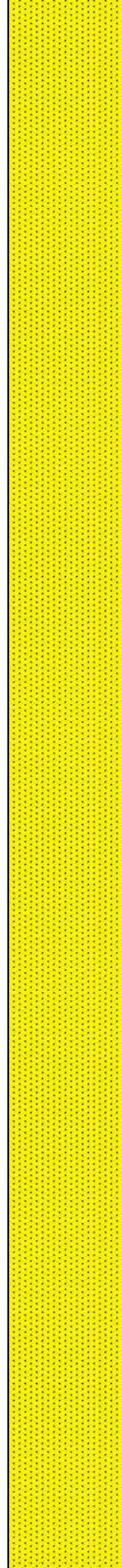
10,960  
10,970  
10,980  
10,990  
11,000  
11,010  
11,020  
11,030  
11,040  
11,050  
11,060  
11,070  
11,080  
11,090  
11,100  
11,110  
11,120  
11,130  
11,140  
11,150  
11,160  
11,170

MD: 10,983'  
TVD: 7,592.71'  
INC: 89.65°  
AZM: 89.13°  
VS: 3,457.19'

WOB: 30.6klbs  
RPM: 61  
SPM: 187  
SPP: 4,661psi

MD: 11,077'  
TVD: 7,593.11'  
INC: 89.87°  
AZM: 88.78°  
VS: 3,551.18'

MD: 11,172'  
TVD: 7,593.21'  
INC: 90°  
AZM: 88.25°



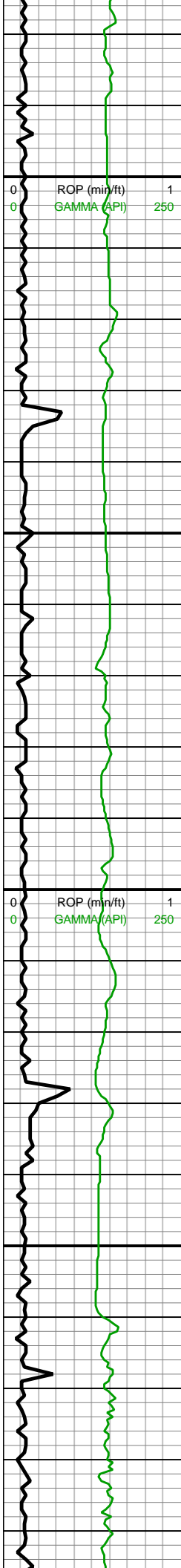
10900-11000 SST  
(100%): dk gy-dk gy brn  
gr-mtx sup clus, occ lt  
gy-gy mtx sup sst, pred  
dk gy wi f sb rd qtz sd gr  
incl, p srtd vf-f sd grs,  
pred sb rd-rd sli fri gr sup  
ss clus cons wi silc & arg  
cmt, uncons ip, non calc

11000-11100 SST  
(100%): gy-dk gy s&p sst  
clus, sme tn sst clus,  
mod srtd f sb rd-rd sd  
grs, frm-hd sli fri predy gr  
sup ss clus cons wi silc  
cmt, occ mtx sup ss clus  
cons wi arg & sl silc cmt,  
predy non calc, v sl calc  
ip

11100-11200 SST  
(100%): dk brn-dk  
gy-sbbr, p mod srtd vf u f







AZM: 88.20°  
VS: 3,646.15'

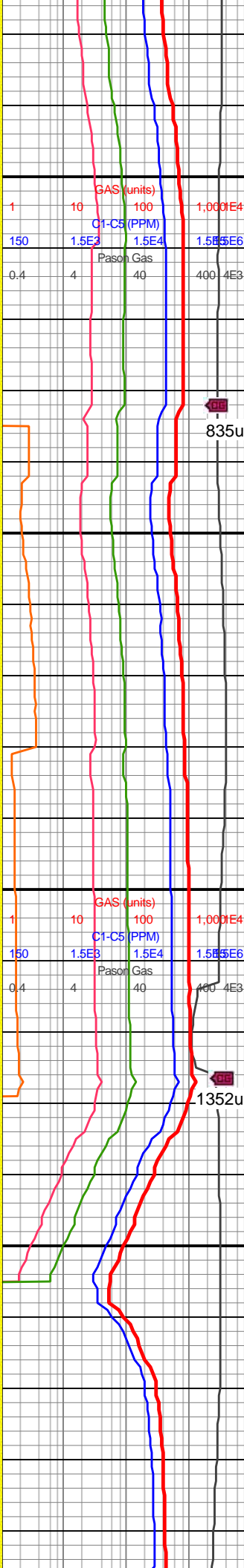
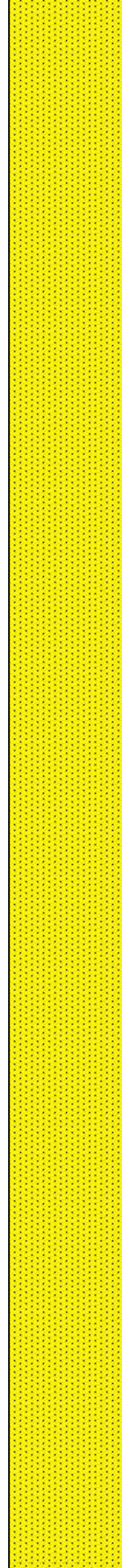
WOB: 36.2klbs  
RPM: 60  
SPM: 188  
SPP: 4,675psi

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

MD: 11,267'  
TVD: 7,593.21'  
INC: 90°  
AZM: 87.11°  
VS: 3,741.08'

MW IN: 9.9+  
VIS IN: 46  
MW OUT: 40.0  
VIS OUT: 44

MD: 11,361'  
TVD: 7,593.61'  
INC: 89.52°  
AZM: 85.44°  
VS: 3,834.88'



gyshbn, p-mod sld vf-u  
sd grs, pred dk gy frm, sl  
fri gy-dk gy sst clus cons  
wi silc cmt grdg to sltst  
ip, com med frm mtx sup  
arg sst clus, com uncon  
vf-u f sb rd-rd sd grs, rr vf  
pyr, non calc

11200-11300 SST  
(100%): pred med  
gyshbn, occ lt gy-lt brn,  
sme red-brn, frm-v frm,  
blky, pred mod-w cons gr  
sup cls cons wi silc cmt,  
non calc, vf-f grnd, occ  
grdg to slt, com micmica,  
tr imbd pyr, scat sh frags

11400-11500 SST  
(100%): dk gy-dk gy brn  
gr-mtx sup clus, occ lt  
gy-gy mtx sup shy ss,  
pred dk gy wi f sb rd qtz  
sd gr incl, p srtd vf-f sd  
grs, pred sb rd-rd sli fri gr  
sup ss clus cons wi silc  
& arg cmt, uncon ip, non

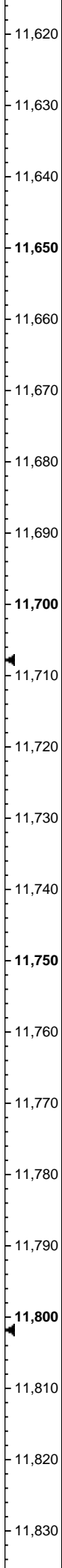
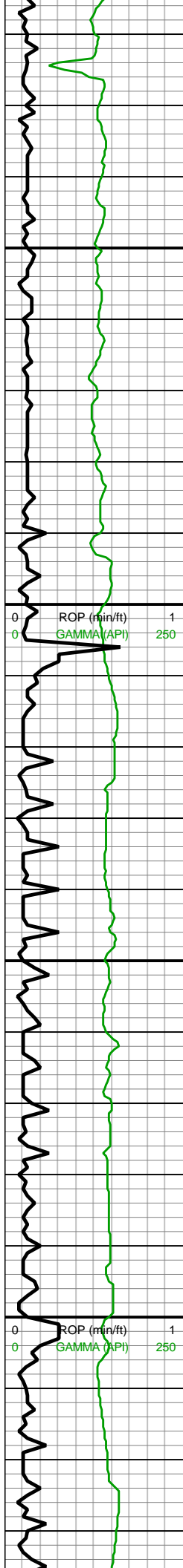




11,600



11500-11600 SST  
(100%): pred dk gy wi f  
sb rd qtz sd gr incl, sme lt  
gy-lt gy brn, p srted vf-f sd  
grs, pred sb rd-rd sli fri gr  
sup ss clus cons wi silc  
& arg cmt, rr c pyr, non  
calc, sl calc ip, tr-scat sh  
frags

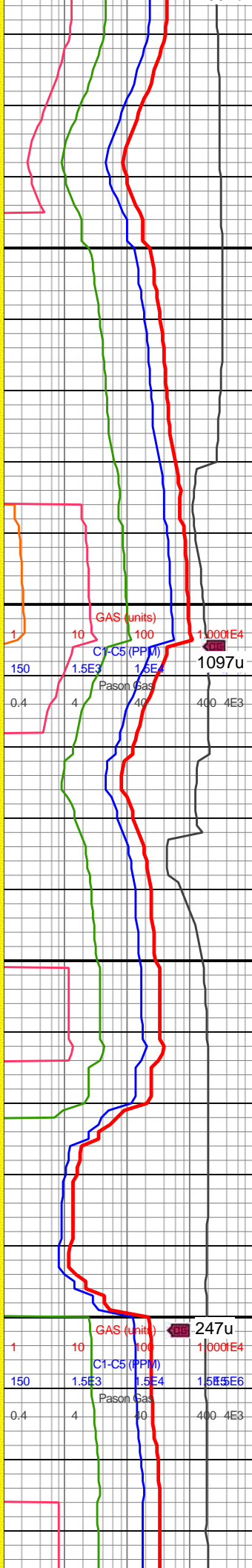
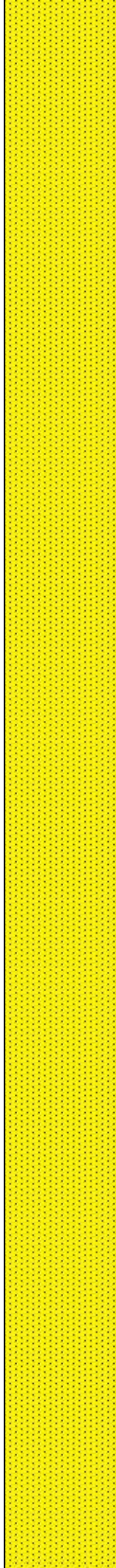


MD: 11,646'  
TVD: 7,595.46'  
INC: 89.3°  
AZM: 90.01°  
VS: 4,119.71'

MD: 11,740'  
TVD: 7,596.43'  
INC: 89.52°  
AZM: 89.74°  
VS: 4,213.7'

WOB: 31.4klbs  
RPM: 60  
SPM: 188  
SPP: 4,671psi

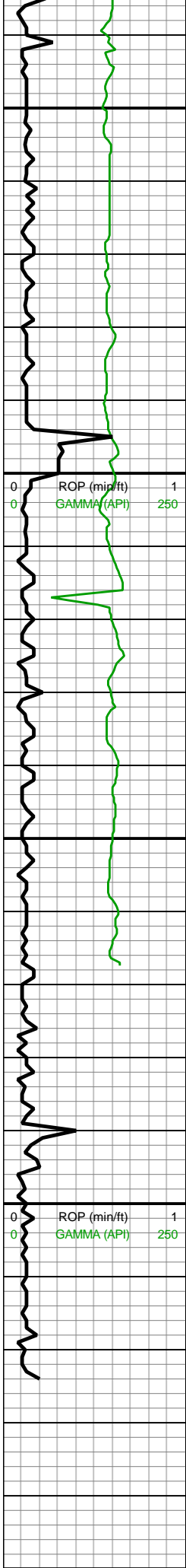
MD: 11,834'  
TVD: 7,596.83'  
INC: 90°



11600-11700 SST  
(100%): dk brn-dk  
gyshbn, p-mod srtd vf-u f  
sd grs, pred dk gy frm, sl  
fri gy-dk gy sst clus cons  
wi silc cmt grdg to sltst  
ip, com med frm mtx sup  
arg sst clus, com uncons  
vf-u f sb rd-rd sd grs, rr vf  
pyr, non calc

11700-11800 SST  
(100%): dk gy-dk gy brn  
gr-mtx sup clus, occ lt  
gy-gy mtx sup shy ss,  
pred dk gy wi f sb rd qtz  
sd gr incl, p srtd vf-f sd  
grs, pred sb rd-rd sli fri gr  
sup ss clus cons wi silc  
& arg cmt, uncons ip, non  
calc





AZM: 89.13°  
VS: 4,307.7'

MW IN: 9.9  
VIS IN: 46  
MW OUT: 10.0  
VIS OUT: 44

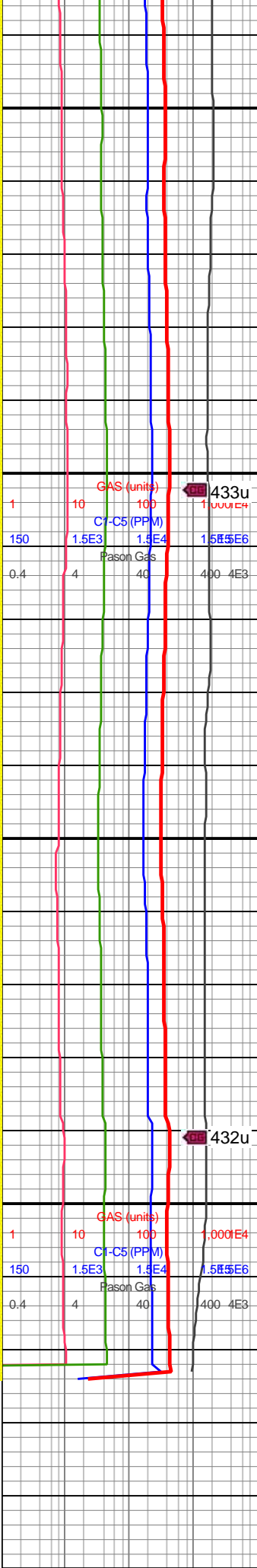
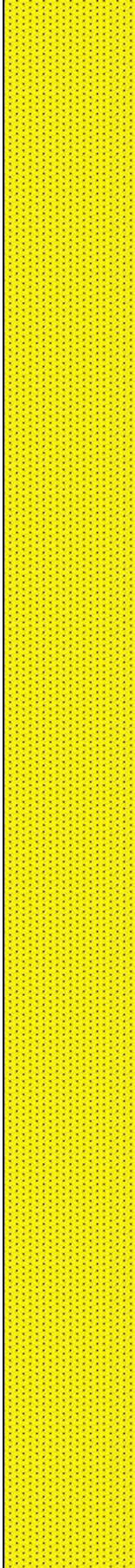
MD: 11,929'  
TVD: 7,596.39'  
INC: 90.53°  
AZM: 88.95°  
VS: 4,402.69'

MD: 11,962'  
TVD: 7,595.97'  
INC: 90.92°  
AZM: 89.04°  
VS: 4,435.68'

WOB: 20.3klbs  
RPM: 60  
SPM: 188  
SPP: 4,249psi

**\*Bit Projection\***  
MD: 12,024'  
TVD: 7,594.97'  
INC: 90.92°  
AZM: 89.04°  
VS: 4,497.67'

**TD Well @  
2235hrs  
8/31/2018**



11800-11900 SST  
(100%): gy-dk gy s&p sst  
clus, sme tn sst clus,  
mod strtd f sb rd-rd sd  
grs, frm-hd sli fri predy gr  
sup ss clus cons wi silc  
cmt, occ mtx sup ss clus  
cons wi arg & sl silc cmt,  
predy non calc, v sl calc  
ip



11900-12024 SST  
(100%): gy-dk gy s&p sst  
clus, sme tn sst clus,  
mod strtd f sb rd-rd sd  
grs, frm-hd sli fri predy gr  
sup ss clus cons wi silc  
cmt, occ mtx sup ss clus  
cons wi arg & sl silc cmt,  
predy non calc, v sl calc  
ip

