



# RESERVOIR GROUP

Scale: 5" / 100'  
Measured Depth Log

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

**Location** Sec. 25 T1N R66W

**State** Colorado

**County** Weld

**Country** USA

**Rig Number** Ensign 140

**API Number** 05123461240000

**AFE #** 16190871

**Geographic Region** Rockies

**Field** Wattenberg

**Spud Date** 8/17/2018

**Drilling Completed** 8/19/2018

**Surface Coordinates** Lat/Long: 40.01884/-104.733853  
SHL: Sec: 25 Twp: 1N 66W  
Footage: 1393 FSL 310 FWL

**Bottom Hole Coordinates** Proposed BHL: Sec: 25 Twp: 1N 66W  
Footages: 2315 FFSLL 460 FFELL

**Ground Elevation** 5,086'

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

**Logged Interval** 6,800' To 11,835'

**Total Depth** 11,835'

**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

## 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-522

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

**Service Start Date:** 8/17/2018

## 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

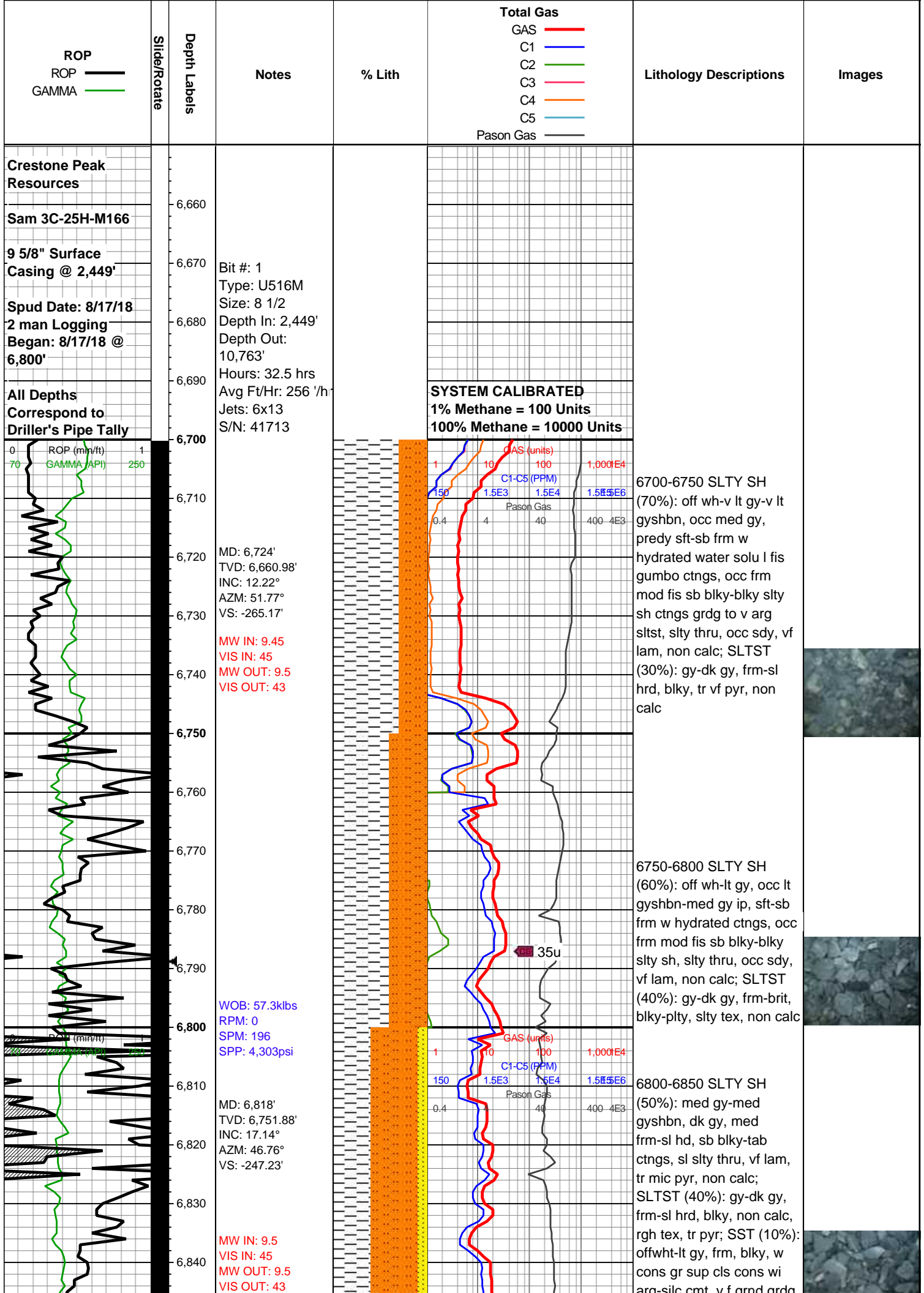
BOUNDSTONE  
CHALKY  
CRYPTOXLN  
EARTHY  
FINELYXLN  
GRAINSTONE

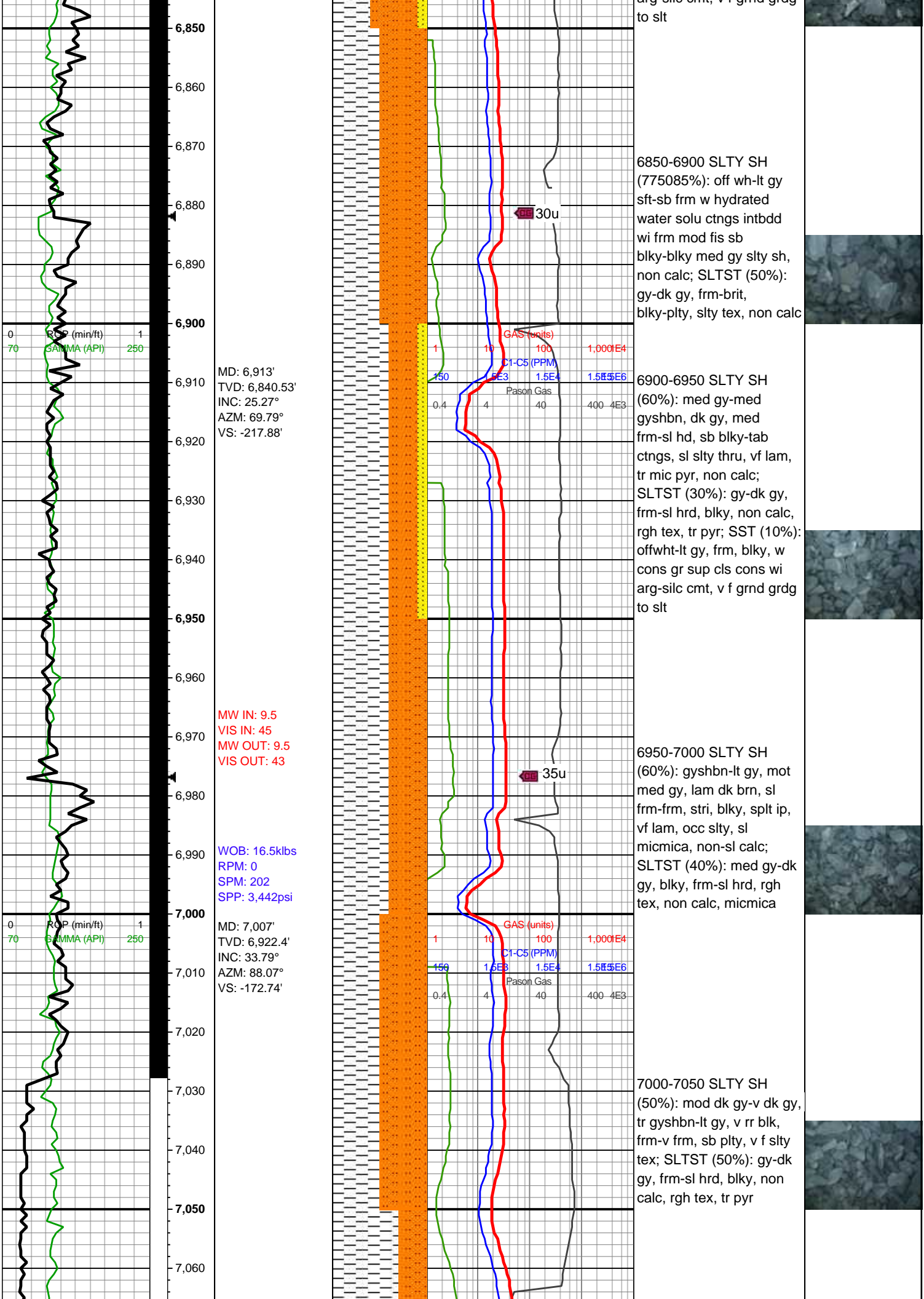
LITHOGRAPHIC  
MICROXLN  
MUDSTONE  
PACKSTONE  
WACKESTONE

### Sorting

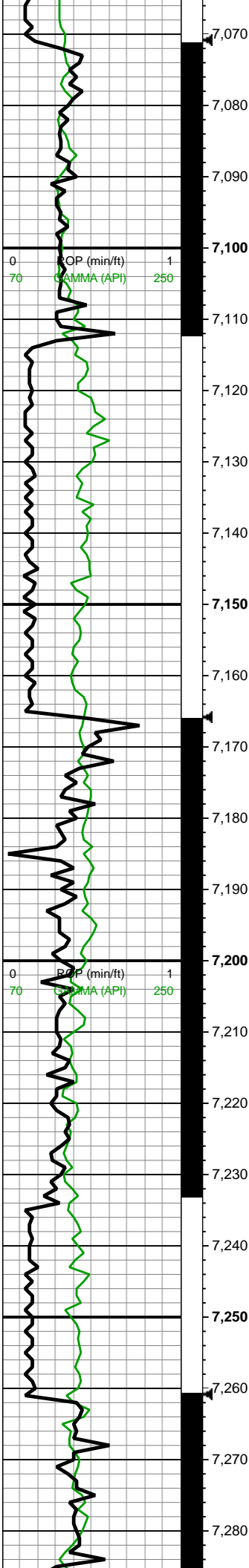
MODERATE  
POOR  
WELL











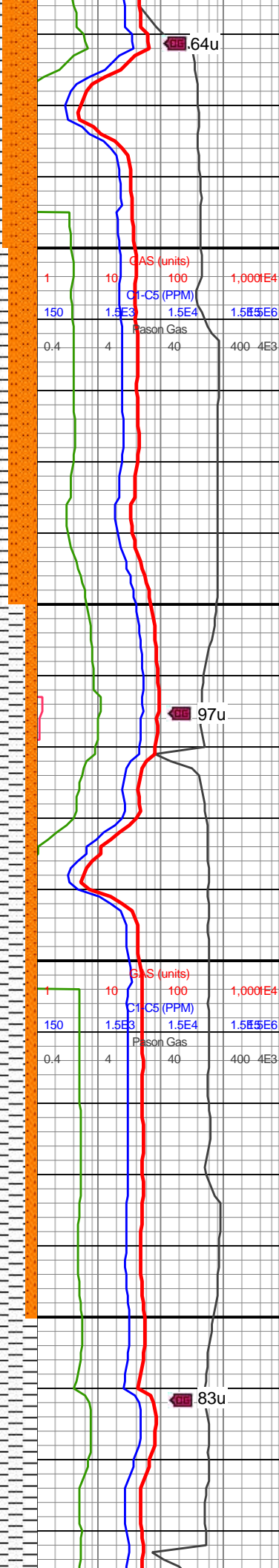
MD: 7,102'  
TVD: 6,999.58'  
INC: 37.53°  
AZM: 86.75°  
VS: -117.42'

MW IN: 9.4  
VIS IN: 46  
MW OUT: 9.4  
VIS OUT: 46

MD: 7,197'  
TVD: 7,073.17'  
INC: 40.91°  
AZM: 88.6°  
VS: -57.41'

WOB: 31.7klbs  
RPM: 0  
SPM: 202  
SPP: 3,531psi

MW IN: 9.7  
VIS IN: 47  
MW OUT: 9.5  
VIS OUT: 46



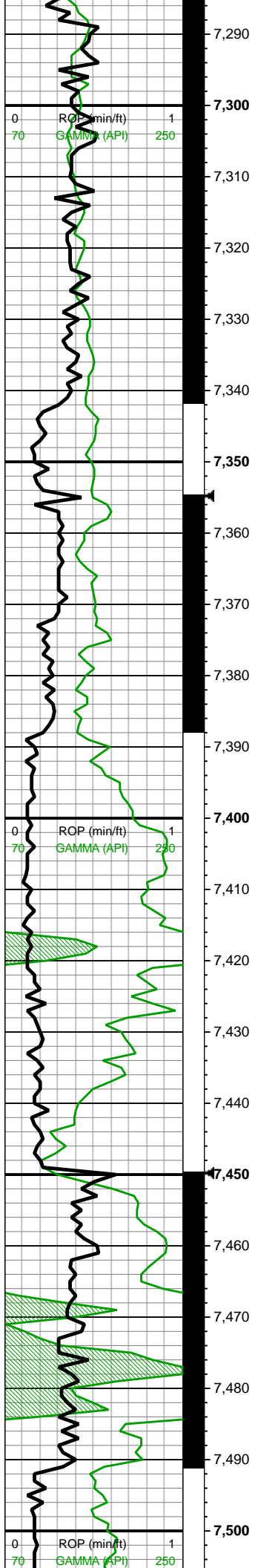
7050-7100 SLTY SH  
(70%): mod dk gy-v dk gy,  
tr gyshbn-lt gy, v rr blk,  
frm-v frm, sb plty, v f slty  
tex; SLTST (30%): gy-dk  
gy, frm-sl hrd, blk, non  
calc, rgh tex, tr pyr

7100-7150 SLTY SH  
(75%): v lt gy-lt gy, predy v  
sft w hydrated, sme sb  
frm, mod fis sb blk, ctngs  
wi f lamn, sm arg-sl slty  
tex, non calc; SLTST  
(25%): gy-dk gy, occ v dk  
gy-blk, frm, brit, non calc,  
sl calc ip

7150-7200 SLTY SH  
(90%): lt gy, predy sft,  
sme sb frm, mod fis sb  
blk, ctngs wi f lamn, w  
hydrated & swelling, sm  
arg-sl slty tex, non calc;  
SLTST (10%): gy-dk gy,  
occ v dk gy-blk, frm, brit,  
occ wvy vugy lt gy silc vn  
ip, non calc, sl calc ip

7200-7250 SLTY SH  
(90%) pred lt- med gry wi  
sl bnshgy, v frm wi sme  
fis, v plty-sb blk, sm tex  
wi scat micmica, non-sl  
calc; SLTST (10%): gy-dk  
gy, frm-sl hrd, blk, non  
calc, rgh tex, tr pyr

7250-7300 SLTY SH  
(100%): gyshbn-med gy,  
mot lt gy, lam dk brn,  
blk-sb tab ctngs, sl



MD: 7,291'  
TVD: 7,139.14'  
INC: 49.83°  
AZM: 88.6°  
VS: 9.4'

WOB: 31.1klbs  
RPM: 31  
SPM: 200  
SPP: 3,808psi

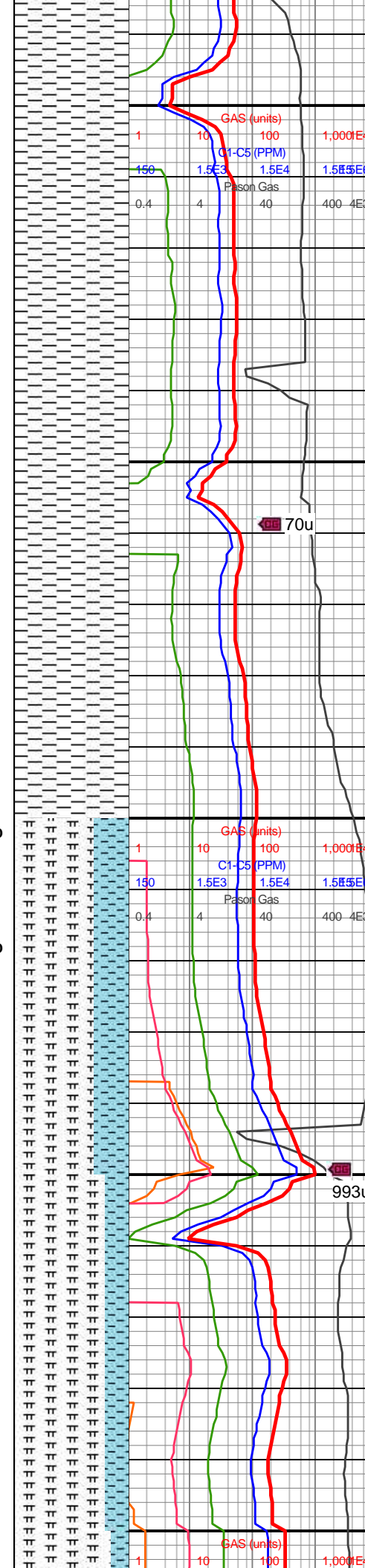
MD: 7,385'  
TVD: 7,193.77'  
INC: 59.02°  
AZM: 88.25°  
VS: 85.74'

Sharon Springs  
7396 MD/7199 TVD

Niobrara  
7421 MD/7212 TVD

MD: 7,480'  
TVD: 7,241.04'  
INC: 61.3°  
AZM: 87.02°  
VS: 168.08'

MW IN: 9.6  
VIS IN: 46  
MW OUT: 9.6  
VIS OUT: 46



frm-frm, stri, vf lam, sl slty  
tex, sl micmica, non-sl  
calc, mn r imbd/dissm  
mic pyr

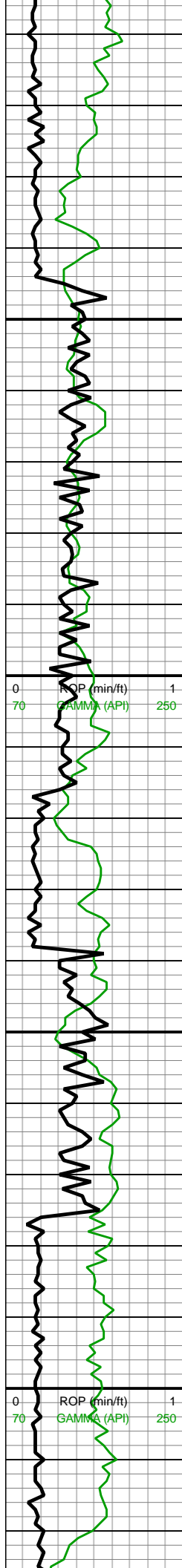
7300-7350 SLTY SH  
(100%): gy-gyshbn wi sp  
blk lith incl, frm, brit, sb  
frm ip, med-hi fis blkly-tab  
ctngs wi wxy lstr, slty arg  
tex, tr tn bent, mod calc

7350-7400 SLTY SH  
(100%): med-dk gy, occ lt  
gy, dk bnshgy, frm-v frm,  
sb plty, pred non calc,  
sm-v f slty tex, occ diss  
pyr

7400-7450 MRLST  
(70%): dk gy-dk gyshbn-v  
dk gy, sb frm-frm-hd,  
l-mod fis sb rd-sb blkly  
ctngs, sm arg tex, sl slty  
tex ip, dul-wxy lstr, tr vf  
pyr, tr bent, hi calc; CHK  
(30%): dk gy wi f wh chky  
lamn & incl, frm, mod fis  
sb blkly ctngs, hi calc

7450-7500 MRLST  
(80%): v dk gy-dk gyshbn  
ip, frm-v frm, blkly, v calc,  
rgh tex, mot-stri, sme fy  
lam, tr pp pyr; CHK  
(20%): dk gy-brn, com lt  
gy-mot, blkly, sft, fri, chky  
tex, occ stri





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  
7,660  
7,670  
7,680  
7,690  
7,700  
7,710  
7,720

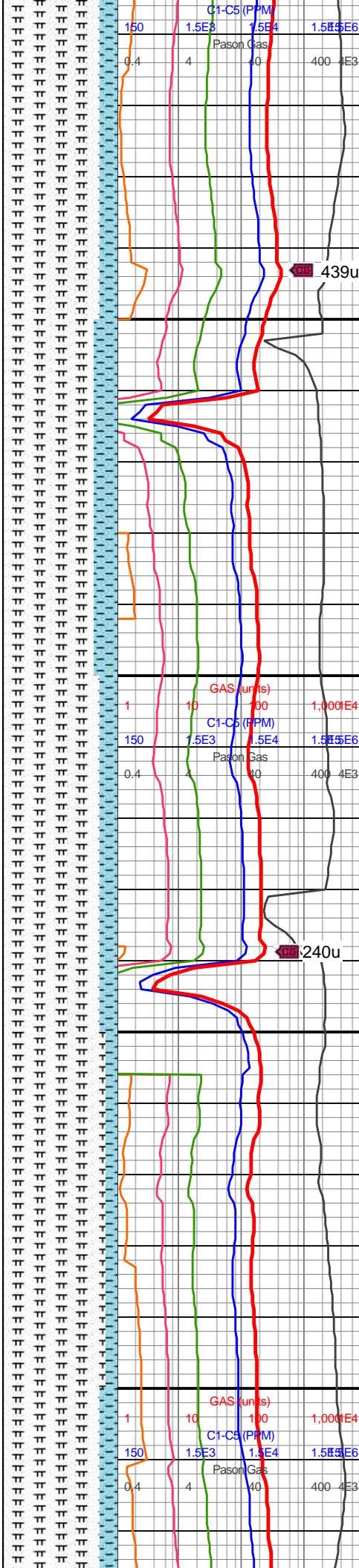
MD: 7,575'  
TVD: 7,282.49'  
INC: 66.93°  
AZM: 85.7°  
VS: 253.34'

**MINDEPTH 8/18/18**

WOB: 37.4klbs  
RPM: 0  
SPM: 202  
SPP: 3,885psi

MW IN: 9.7  
VIS IN: 46  
MW OUT: 9.6  
VIS OUT: 46

MD: 7,670'  
TVD: 7,312.55'  
INC: 76.16°  
AZM: 90.27°  
VS: 343.28'



7500-7550 MRLST  
(85%): gyshbn-dk gy,  
frm-hd, occ sft, predy brit,  
sm-sl slty tex, mod-hi  
calc; CHK (15%): lt gy-lt  
gyshbn, sft-sb frm-frm,  
sb blkly, chky tex, tr-rr ptch  
pyr strg, med-hi calc

7550-7600 MRLST  
(80%): dk gy-dk gyshbn,  
sl hd-v frm, mod fis, sb  
blkly-tab ctngs, sm arg  
tex, mod calc, tr pp mic  
pyr; CHK (20%): med  
brn-gyshbn, frm-sft, mod  
fis, tab-sb blkly, tr free  
CHK, v calc

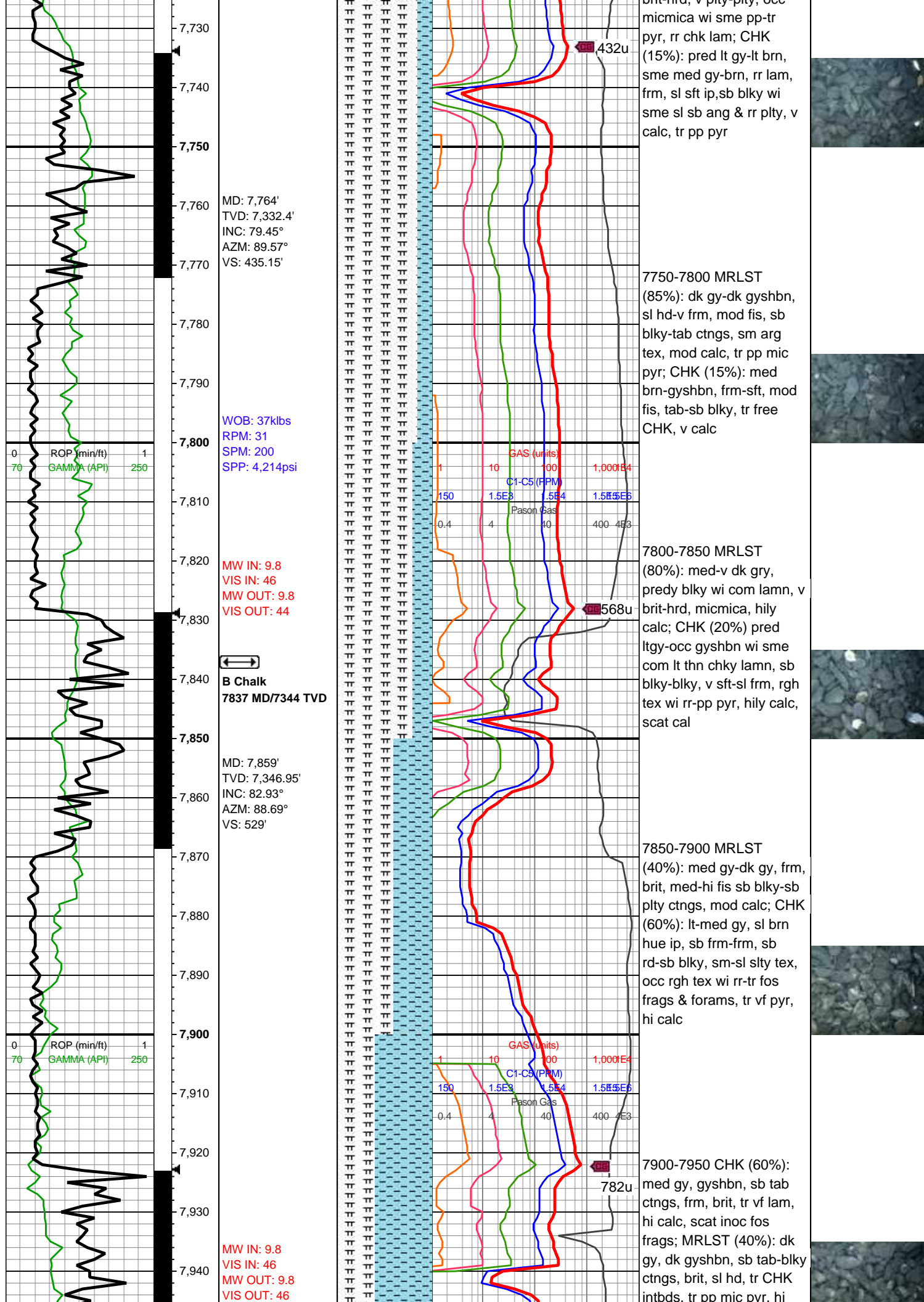
7600-7650 MRLST  
(85%): med-v dk gry,  
predy blkly wi com lamn, v  
brit-hrd, micmica, hily  
calc; CHK (15%) pred  
ltgy-occ gyshbn wi sme  
com lt thn chky lamn, sb  
blkly-blky, frm, rgh tex wi  
rr-pp pyr, hily calc

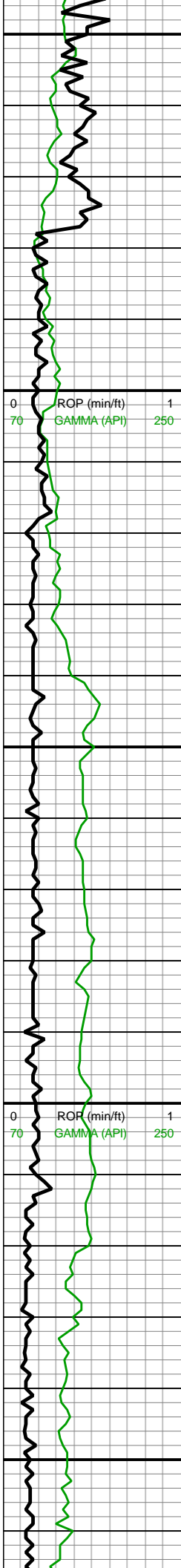
7650-7700 MRLST  
(90%): predy dk gyshbn,  
com dk gy wi brn marly  
incl, frm-brit ip mod fis sb  
blkly-blky-tab ctngs, sl slty  
tex, mod calc; CHK  
(10%): dk gy wi vf lt gy  
chky lamn & f chky incl,  
l-mod fis sb rd-sb blkly  
frm-sl brit ctngs, hi calc

7700-7750 MRLST (85%)  
med-pred dk gry,sl  
brit-hrd, v plty-plty, occ









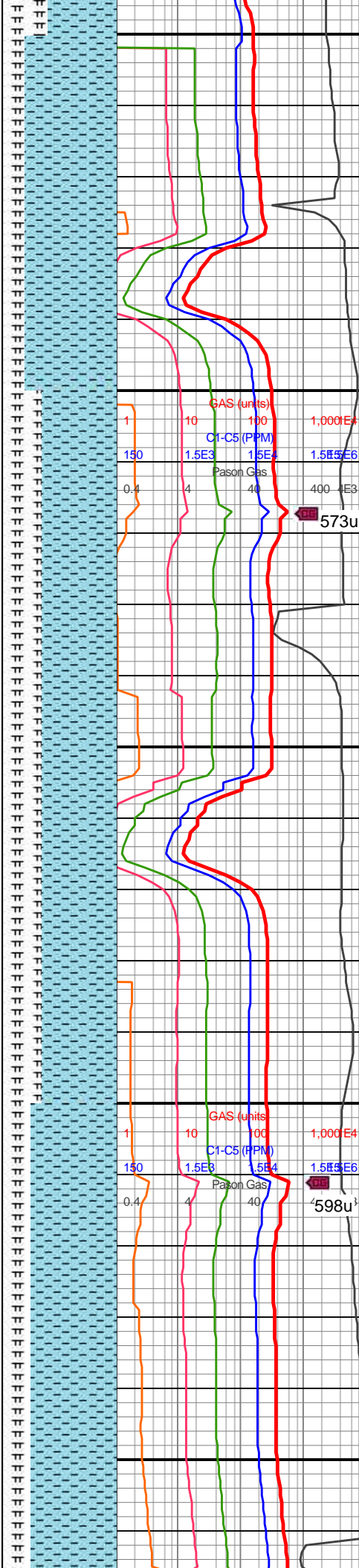
7,950  
7,960  
7,970  
7,980  
7,990  
8,000  
8,010  
8,020  
8,030  
8,040  
8,050  
8,060  
8,070  
8,080  
8,090  
8,100  
8,110  
8,120  
8,130  
8,140  
8,150  
8,160

MD: 7,954'  
TVD: 7,353.86'  
INC: 88.73°  
AZM: 85.52°  
VS: 623.59'

WOB: 35.7klbs  
RPM: 30  
SPM: 200  
SPP: 4,180psi

MD: 8,048'  
TVD: 7,354.25'  
INC: 90.79°  
AZM: 86.4°  
VS: 717.36'

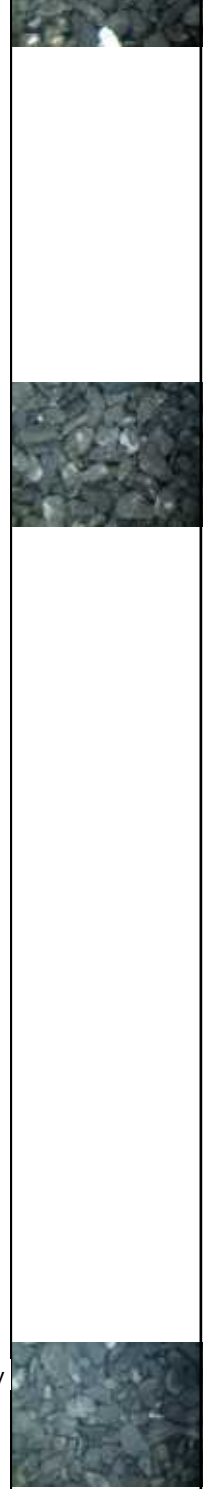
MD: 8,143'  
TVD: 7,353.02'  
INC: 90.7°  
AZM: 86.23°  
VS: 812.16'

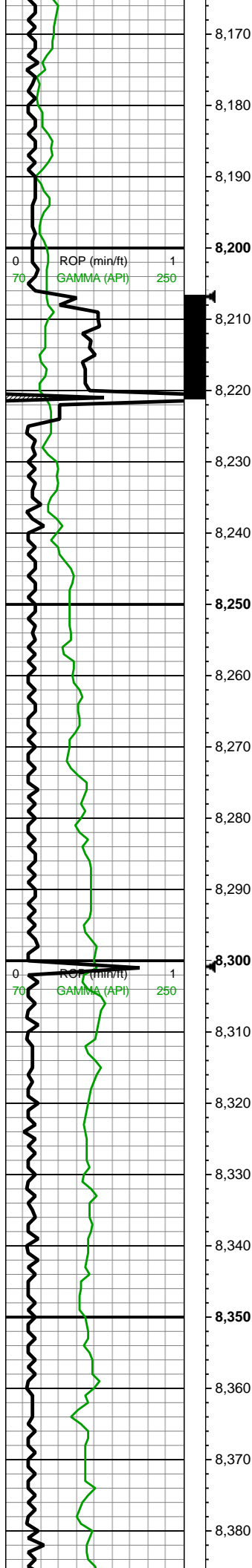


calc

7950-8000 CHK (80%): lt gyshbn, occ lt gy-dk gy wi occ chky incl, sft-sb frm-frm-brit, sb blkly, tr vf pyr, scat mic fos frags, occ lse cal, hi calc; MRLST (20%): predy dk gy, occ med-dk gyshbn, frm-hd-brit, sm sl slty tex, rgh tex ip, mod calc

8000-8100 CHK (65%): med gy, gyshbn, sb tab ctngs, frm, brit, tr vf lam, hi calc, scat inoc fos frags; MRLST (35%): dk gy, dk gyshbn, sb tab-blky ctngs, brit, sl hd, tr CHK intbds, tr pp mic pyr, hi calc



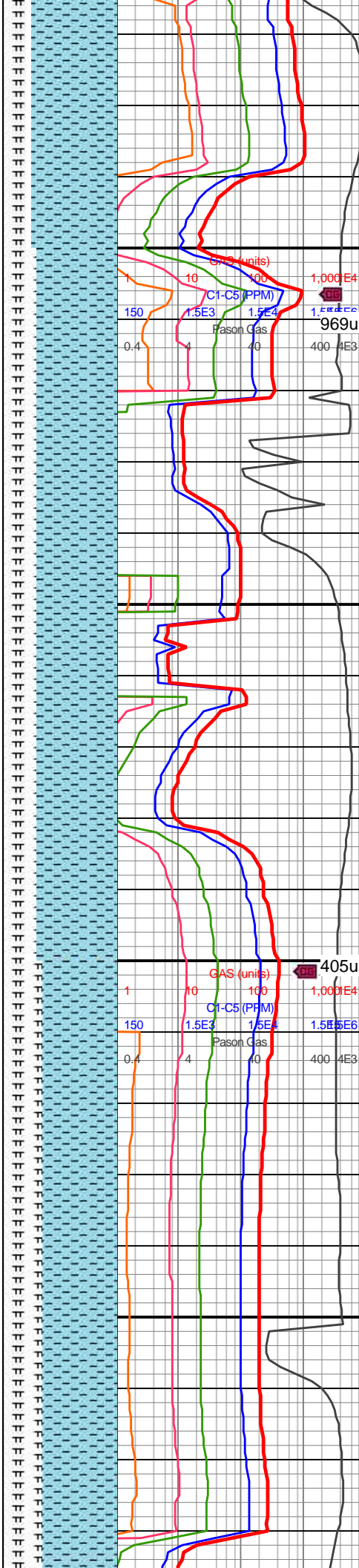


WOB: 39.6klbs  
RPM: 60  
SPM: 203  
SPP: 4,401psi

MW IN: 9.8  
VIS IN: 46  
MW OUT: 9.85  
VIS OUT: 44

MD: 8,237'  
TVD: 7,353.35'  
INC: 88.9°  
AZM: 87.55°  
VS: 906.02'

MD: 8,331'  
TVD: 7,355.79'  
INC: 88.11°  
AZM: 86.67°  
VS: 999.95'

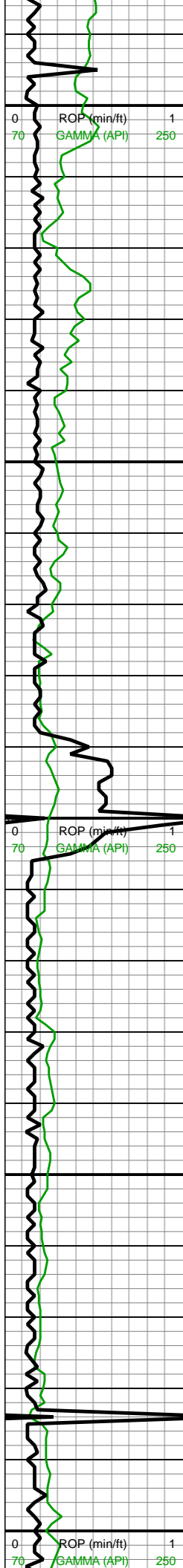


8100-8200 CHK (75%):  
predy med gyshbn-med  
brn, sme dk brn, mot ip,  
occ stri, pred sft-sl frm,  
blky, hi calc, chky tex, tr-rr  
mic fos, scat pyrc nod;  
MRLST (25%): pred v dk  
gy, occ blk, frm-hrd, occ v  
hrd, blky, sme plty, calc-v  
calc, occ slty, tr pp pyr

8200-8300 CHK (70%): lt  
gyshbn, occ lt gy-dk gy wi  
occ chky incl, sft-sb  
frm-frm-brit, sb blky, tr vf  
pyr, hi calc; MRLST  
(30%): predy dk gy, occ  
med-dk gyshbn,  
frm-hd-brit, sm sl slty tex,  
rgh tex ip, mod calc

8300-8400 CHK (65%):  
med gy-dk gyshbn, sb  
blky ctngs, fri-frm, tr  
MRLST intbd, sm chky  
tex, mod-hi calc; MRLST





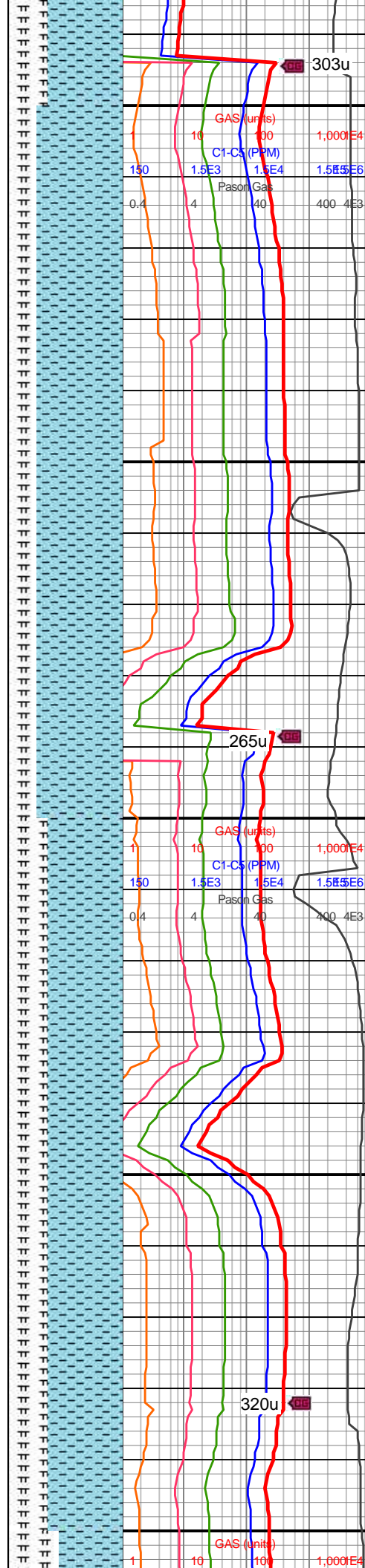
WOB: 36.1klbs  
RPM: 61  
SPM: 198  
SPP: 4,420psi

MD: 8,426'  
TVD: 7,359.58'  
INC: 87.32°  
AZM: 86.93°  
VS: 1,094.73'

MD: 8,520'  
TVD: 7,363.08'  
INC: 88.42°  
AZM: 89.22°  
VS: 1,188.61'

MW IN: 9.75  
VIS IN: 45  
MW OUT: 9.8  
VIS OUT: 44

WOB: 38klbs  
RPM: 61  
SPM: 202  
SPP: 4,280psi

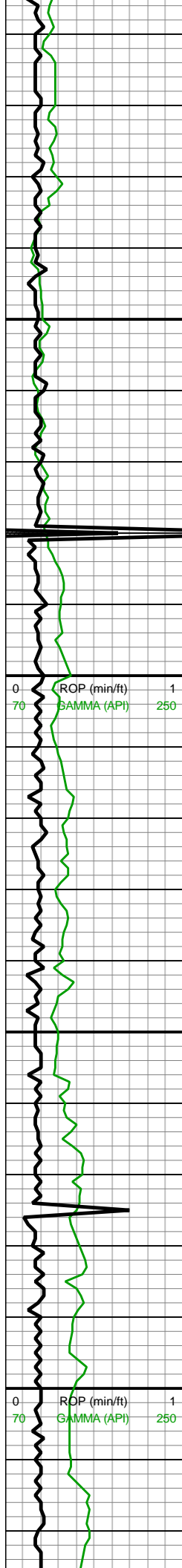


tex, mod hi calc, MRLST  
(35%): dk gyshbn-dk gy,  
frm-sl hd, sb blk-ang  
ctngs, sl sm tex-rgh ip,  
com CHK intbd, hi calc

8400-8500 CHK (75%):  
predy gyshbn-med gy,  
sme lt gy, sb blk-sb ang  
ctngs, fri-frm, tr intbd  
MRLST, sm chky tex,  
calc; MRLST (25%): dk  
gyshbn-dk gy, frm-sl hd,  
sb blk-ang ctngs, sl  
sm-rgh tex, com intbd  
CHK, hi calc

8500-8600 CHK (65%): lt  
gy-med gy, frm, brit, mod  
fis sb blk-blky ctngs,  
slty-sl gt tex wi forams, vf  
pyr, hi calc; MRLST  
(35%): med gy-dk gy, frm,  
brit, sb ang-sb blk-blky  
ctngs, sl slty tex, com vf  
pyr, mod calc wi brn mrlly  
resdl





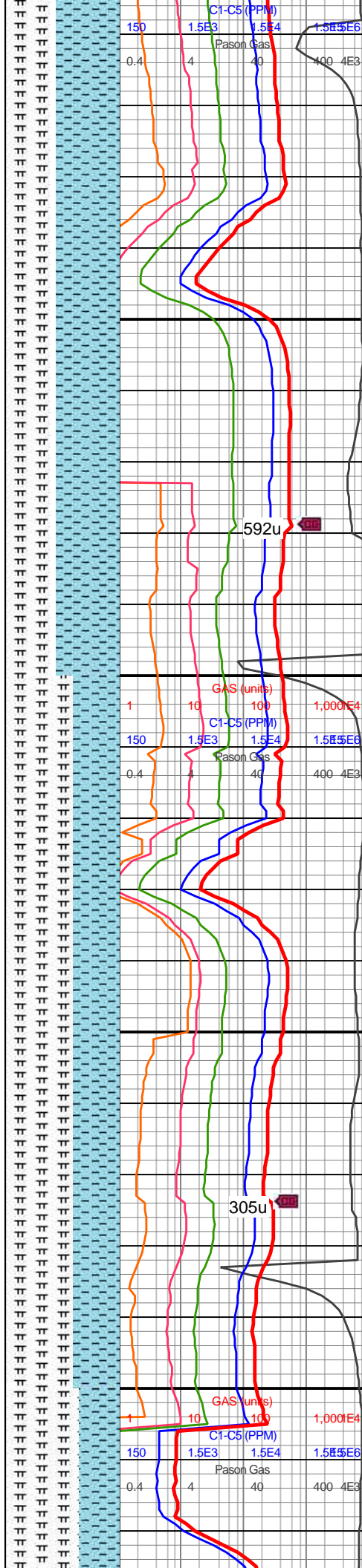
MD: 8,614'  
TVD: 7,365.41'  
INC: 88.73°  
AZM: 89.13°  
VS: 1,282.57'

MD: 8,709'  
TVD: 7,367.88'  
INC: 88.29°  
AZM: 88.78°  
VS: 1,377.53'

WOB: 38klbs  
RPM: 60  
SPM: 201  
SPP: 4,360psi

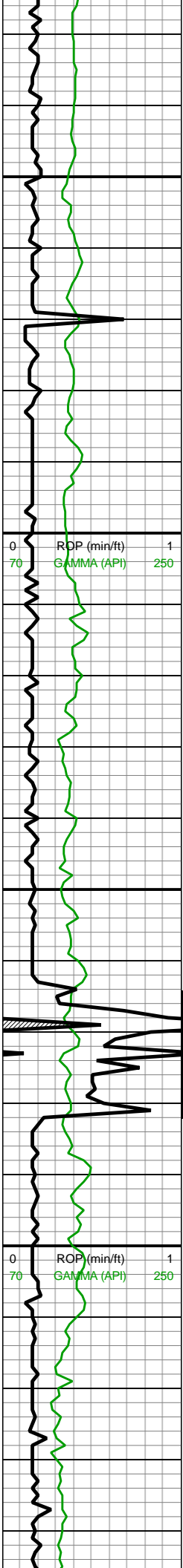
MD: 8,803'  
TVD: 7,370.66'  
INC: 88.33°  
AZM: 88.07°  
VS: 1,471.45'

MW IN: 9.8



8600-8700 CHK (55%): lt gy-med gy, frm, brit, mod fis sb blkly-blky ctngs, slty-sl gt tex wi forams, vf pyr, hi calc; MRLST (45%): med gy-dk gy, frm, brit, sb ang-sb blkly-blky ctngs, sl slty tex, com vf pyr, mod calc wi brn mrly resdl

8700-8800 MRLST (60%): med gy-dk gy-gyshbn ip, sb frm-frm-brit, l-mod fis sb rd-sb blkly ctngs, sm arg-sl slty tex, rr vf pyr, tr bent, mod calc wi brn mrly resdl; CHK (40%): med gy, lt gy ip, frm, brit, mod fis sb blkly-blky ctngs, sl slty tex, tr fos frags, hi calc



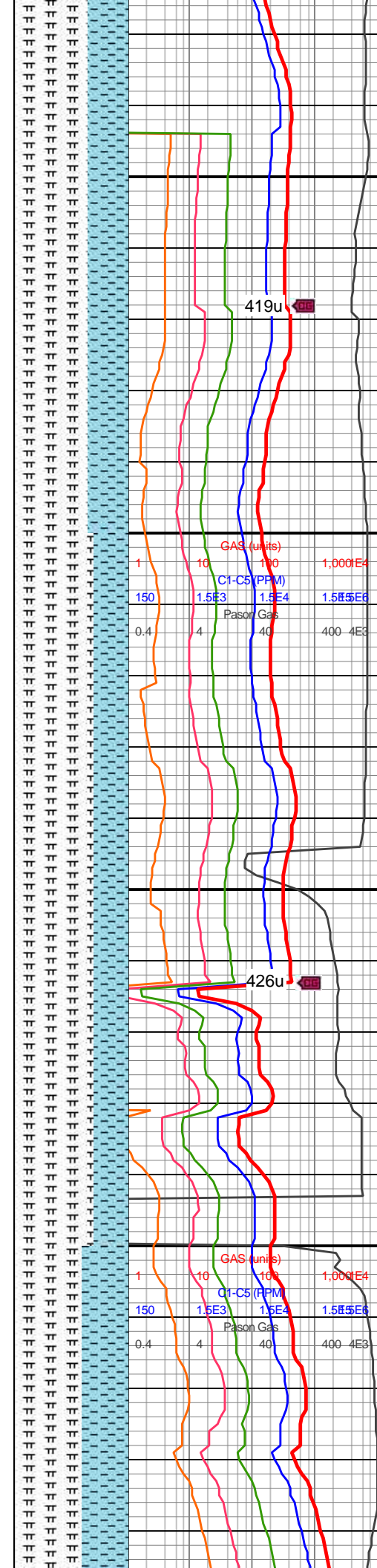
VIS IN: 46  
MW OUT: 9.8  
VIS OUT: 44

MD: 8,899'  
TVD: 7,373.05'  
INC: 88.81°  
AZM: 87.9°  
VS: 1,567.37'

MD: 8,993'  
TVD: 7,376.84'  
INC: 86.57°  
AZM: 89.92°  
VS: 1,661.27'

WOB: 38klbs  
RPM: 61  
SPM: 200  
SPP: 4,340psi

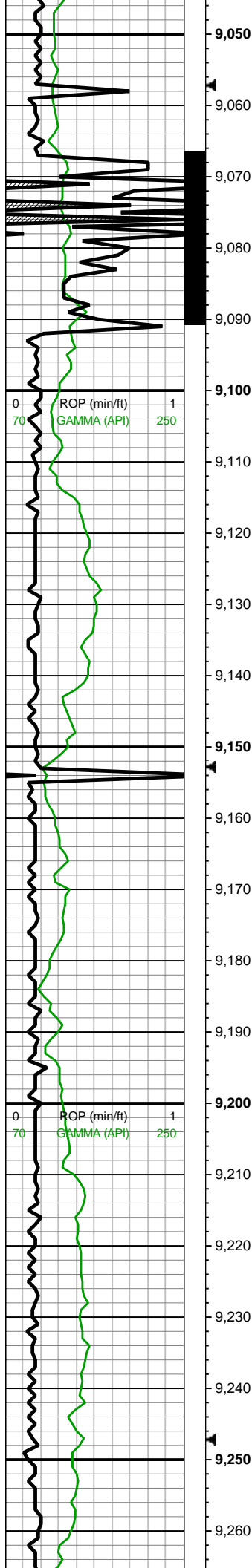
MW IN: 9.8  
VIS IN: 46  
MW OUT: 9.8  
VIS OUT: 45



8800-8900 MRLST  
(65%): med  
gy-gyshbn-dk gy, sb  
frm-frm-brit, sb rd-sb blky  
l-mod fis ctngs, sm  
arg-sl slty tex, rr vf pyr,  
mod calc wi brn mrly  
resdl; CHK (35%): med  
gy, lt gy ip, frm, brit, mod  
fis sb blky-blky ctngs, sl  
slty tex, tr fos frags, hi  
calc

8900-9000 MRLST  
(70%): dk gy, frm-hd, brit,  
mod fis sb ang-sb blky  
ctngs, sm arg-sl slty tex,  
tr vf pyr, tr bent, mod calc;  
CHK (30%): med gy, rr  
f-elong wh chky incl,  
frm-brit, mod fis sb  
blky-blky ctngs, sl slty tex,  
tr fos frags, hi calc



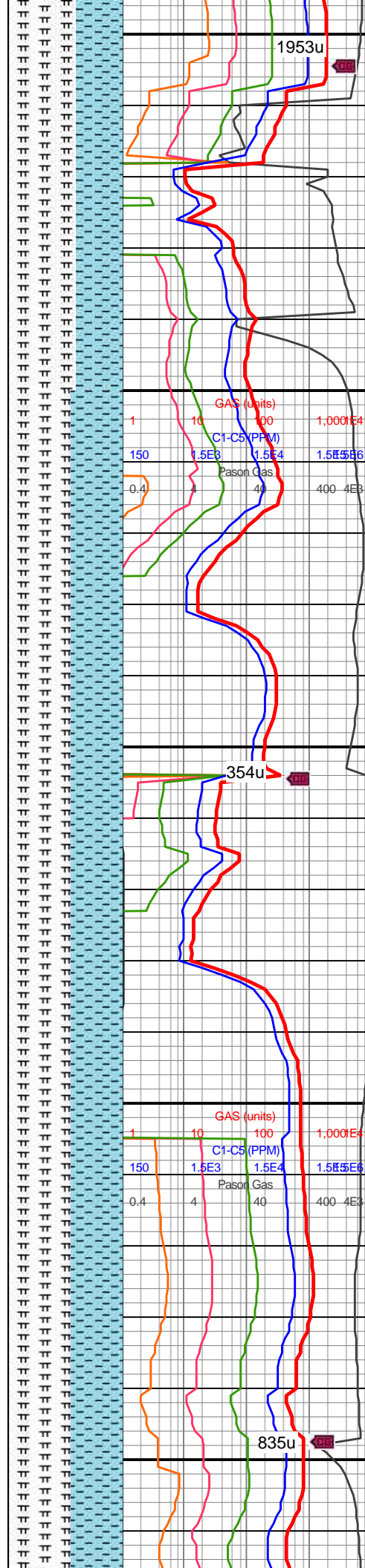


MD: 9,088'  
TVD: 7,380.52'  
INC: 88.99°  
AZM: 90.53°  
VS: 1,756.19'

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

MD: 9,183'  
TVD: 7,381.61'  
INC: 89.69°  
AZM: 89.83°  
VS: 1,851.18'

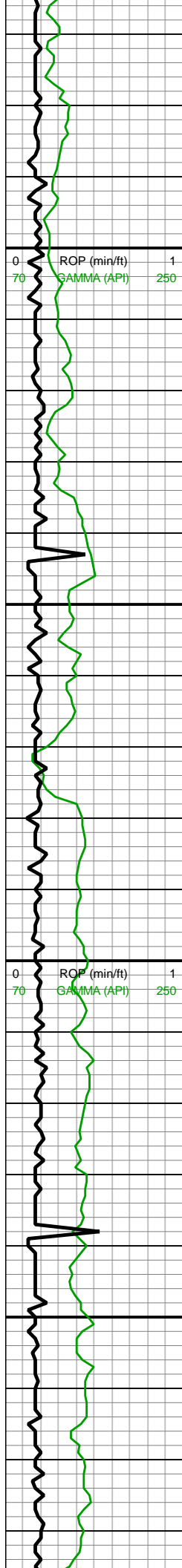
WOB: 36klbs  
RPM: 60  
SPM: 200  
SPP: 4,650psi



9000-9100 MRLST  
(60%): med  
gy-gyshbn-dk gy, sb  
frm-frm-brit, sb rd-sb blk  
l-mod fis ctngs, sm  
arg-sl slty tex, rr vf pyr,  
mod calc wi brn mrlly  
resdl; CHK (40%): med  
gy, lt gy ip, frm, brit, mod  
fis sb blk-bly blk ctngs, sl  
slty tex, tr fos frags, hi  
calc

9100-9200 MRLST  
(55%): med gy-dk gy, sb  
frm-frm, mod fis sb blk  
brit ctngs, sm arg-sl slty  
tex, tr vf pyr, mod calc wi  
brn mrlly resdl; CHK  
(45%): lt gy-med gy wi  
com f wh chky lamn, frm,  
brit, mod fis sb blk-bly  
ctngs, sl slty tex, tr fos  
frags, hi calc



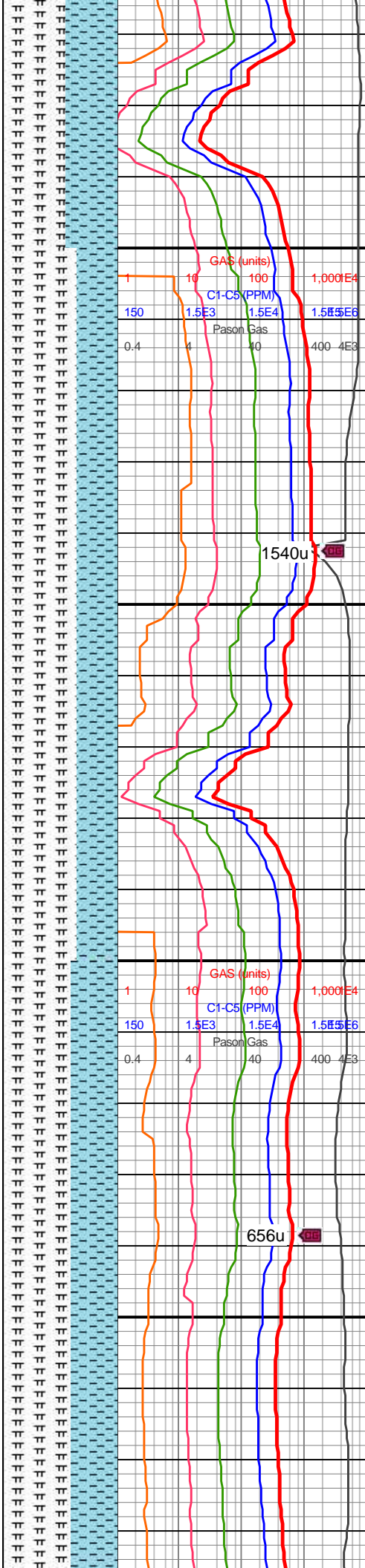


MD: 9,277'  
TVD: 7,382.52'  
INC: 89.21°  
AZM: 89.13°  
VS: 1,945.17'

MD: 9,373'  
TVD: 7,382.92'  
INC: 90.31°  
AZM: 88.16°  
VS: 2,041.14'

WOB: 39klbs  
RPM: 60  
SPM: 202  
SPP: 4,680psi

MD: 9,467'  
TVD: 7,382.92'  
INC: 89.69°  
AZM: 86.75°  
VS: 2,135.05'

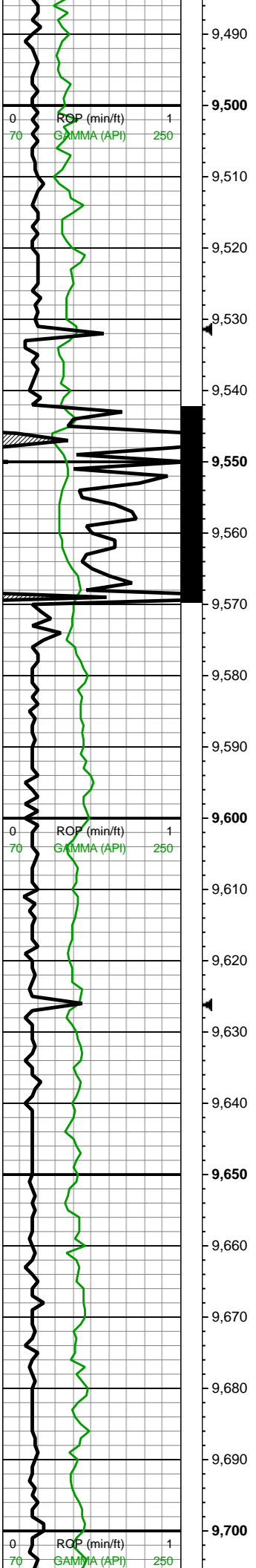


9200-9300 MRLST  
(55%): med gy-dk gy, mod fis sb frm-frm sb blkly ctngs, sm arg-sl slty tex, tr vf pyr, mod calc; CHK (45%): lt gy-med gy, frm-brit, mod fis sb blkly-blky ctngs wi thn chky lamn, sl slty tex, tr fos frags, hi calc

9300-9400 MRLST  
(65%): med gy-gyshbn-dk gy, sb frm-frm-brit, sb rd-sb blkly l-mod fis ctngs, sm arg-sl slty tex, rr vf pyr, mod calc wi brn mrly resdl; CHK (35%): med gy, lt gy ip, frm, brit, mod fis sb blkly-blky ctngs, sl slty tex, tr fos frags, hi calc

9400-9500 MRLST  
(60%): med gy-gyshbn-dk gy, sb frm-frm-brit, sb rd-sb blkly l-mod fis ctngs, sm arg-sl slty tex, tr vf pyr, tr bent, mod calc wi brn mrly resdl; CHK (40%): med calc, mod fis, frm, brit



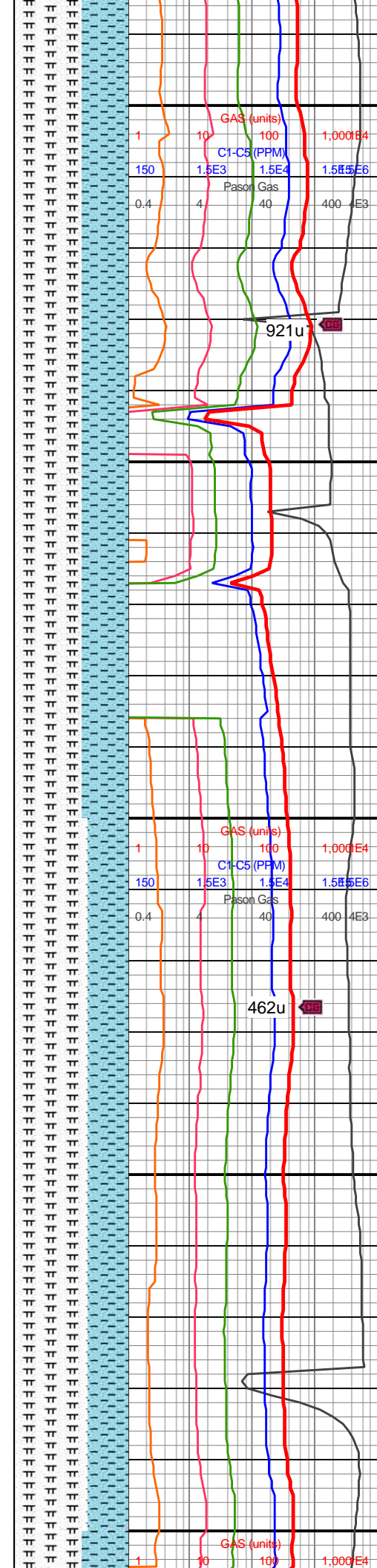


MD: 9,562'  
TVD: 7,382.84'  
INC: 90.4°  
AZM: 89.92°  
VS: 2,230.01'

WOB: 37klbs  
RPM: 61  
SPM: 204  
SPP: 4,610psi

MW IN: 9.8  
VIS IN: 46  
MW OUT: 9.8  
VIS OUT: 44

MD: 9,656'  
TVD: 7,382.05'  
INC: 90.57°  
AZM: 88.6°  
VS: 2,323.99'

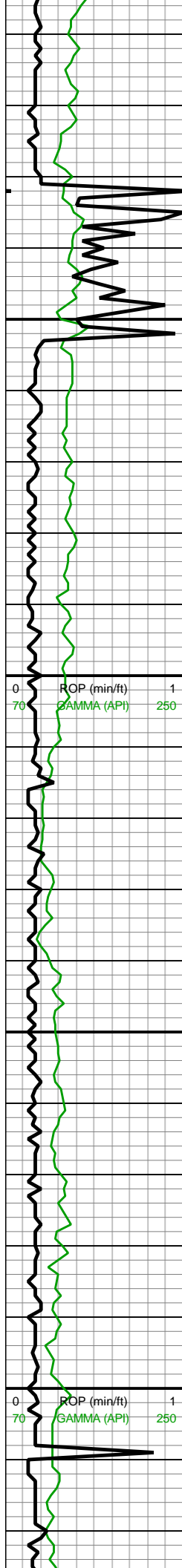


med gy, lt gy ip, frm, brit,  
l-mod fis sb rd-sb  
blky-blky ctngs, sl slty tex,  
rr forams & tr fos frags, hi  
calc

9500-9600 MRLST  
(60%): med gy-dk gy wi  
sp brn marl incl & o stn,  
frm-brit, sb frm ip, l-mod  
fis sb rd-sb blky ctngs,  
sm arg-sl slty tex, tr vf pyr,  
tr bent, mod calc wi brn  
mrly resdl; CHK (40%):  
med gy, lt gy ip, frm, brit,  
l-mod fis sb rd-sb  
blky-blky ctngs, sl slty tex,  
rr forams & tr fos frags, hi  
calc

9600-9700 MRLST  
(65%): med  
gy-gyshbn-dk gy, sb  
frm-frm-brit, sb rd-sb blky  
l-mod fis ctngs, sm  
arg-sl slty tex, tr vf pyr, tr  
bent, mod calc wi brn  
mrly resdl; CHK (35%):  
med gy, lt gy ip, frm, brit,  
l-mod fis sb rd-sb  
blky-blky ctngs, sl slty tex,  
rr forams & tr fos frags, hi  
calc



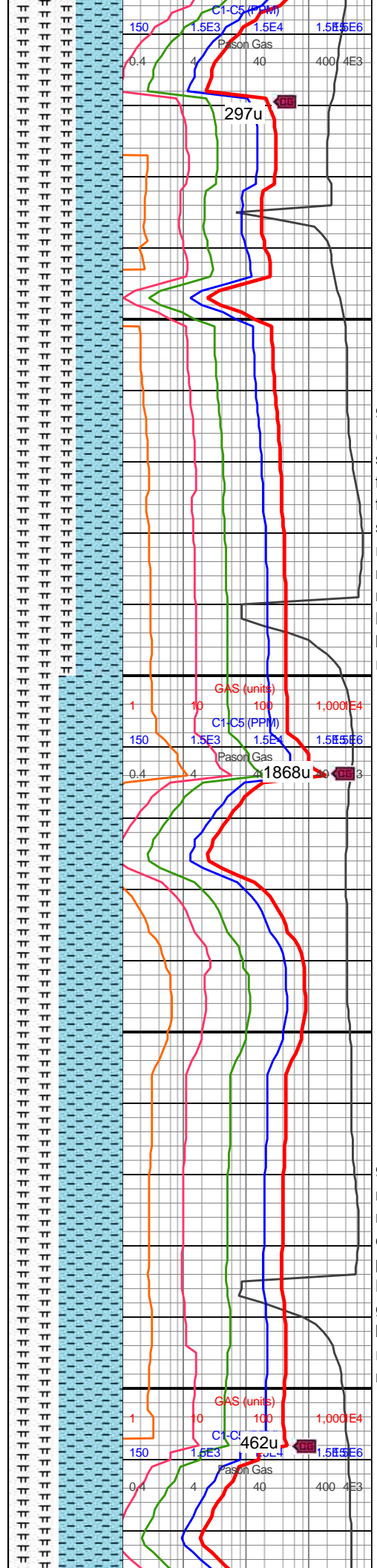


9,710  
9,720  
9,730  
9,740  
9,750  
9,760  
9,770  
9,780  
9,790  
9,800  
9,810  
9,820  
9,830  
9,840  
9,850  
9,860  
9,870  
9,880  
9,890  
9,900  
9,910  
9,920

MD: 9,750'  
TVD: 7,381.01'  
INC: 90.7°  
AZM: 91.24°  
VS: 2,417.98'

WOB: 40klbs  
RPM: 61  
SPM: 202  
SPP: 4,550psi

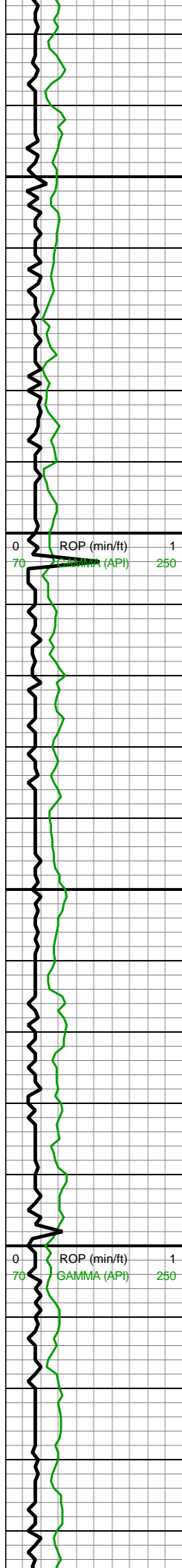
MD: 9,844'  
TVD: 7,379.78'  
INC: 90.79°  
AZM: 91.76°  
VS: 2,511.94'



9700-9800 MRLST  
(60%): med gy-dk gy wi  
sp brn marl incl & o stn,  
frm-brit, sb frm ip, l-mod  
fis sb rd-sb blkly ctngs,  
sm arg-sl slty tex, tr vf pyr,  
rr bent, mod calc wi brn  
mrly resdl; CHK (40%):  
med gy, lt gy ip, frm, brit,  
l-mod fis sb rd-sb  
blkly-blky ctngs, sl slty tex,  
rr forams, hi calc

9800-9900 CHK (55%):  
med gy-dk gy, frm, brit,  
mod fis sb blkly-blky  
ctngs, slty-sl gt tex, tr vf  
pyr, rr forams, hi calc;  
MRLST (45%): med gy-dk  
gy, frm, brit, sb ang-sb  
blkly-blky ctngs, sl slty tex,  
rr bent, mod calc wi brn  
mrly resdl



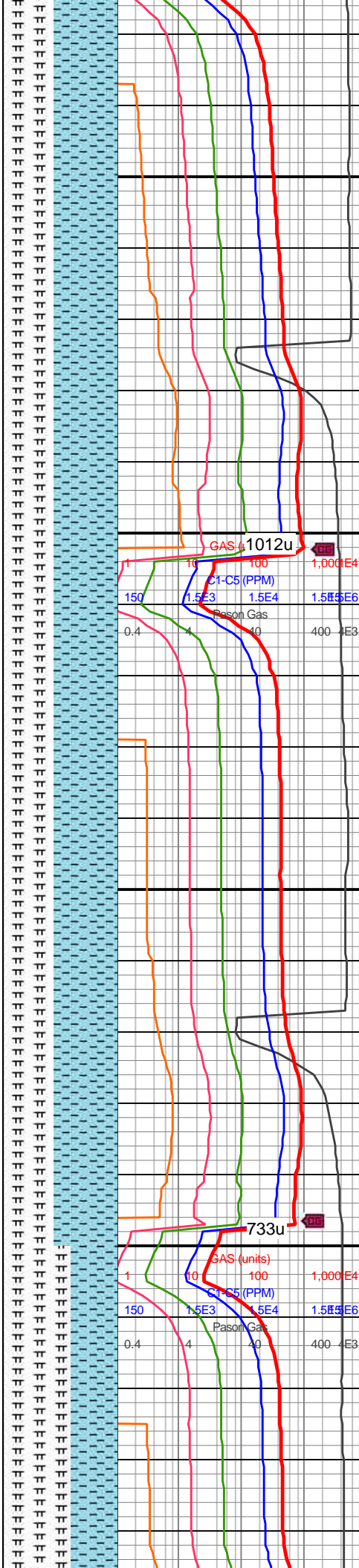


MD: 9,939'  
TVD: 7,378.55'  
INC: 90.7°  
AZM: 90.8°  
VS: 2,606.9'

WOB: 41klbs  
RPM: 60  
SPM: 201  
SPP: 4,640psi

MD: 10,034'  
TVD: 7,377.31'  
INC: 90.79°  
AZM: 90.01°  
VS: 2,701.89'

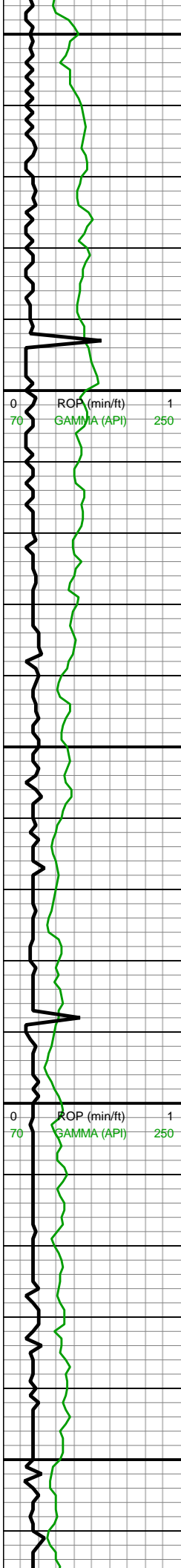
MD: 10,128'  
TVD: 7,376.12'  
INC: 90.66°  
AZM: 89.3°  
VS: 2,795.88'



9900-10000 CHK (55%):  
med gy-occ dk gy, occ f  
wh chky incl & c free chk  
& forams, frm-brit mod fis  
sb blkly-blky ctngs, slty-sl  
gt tex, tr vf pyr, hi calc;  
MRLST (45%): med gy-dk  
gy, frm, brit, sb ang-sb  
blkly-blky mod fis ctngs, sl  
slty tex, com bent, mod  
calc wi brn mrly resdl

10000-10100 CHK  
(55%): med gy-occ dk gy,  
occ f wh chky incl & c free  
chk & forams, frm-brit  
mod fis sb blkly-blky  
ctngs, slty-sl gt tex, tr vf  
pyr, hi calc; MRLST  
(45%): med gy-dk gy, frm,  
brit, sb ang-sb blkly-blky  
mod fis ctngs, sl slty tex,  
com bent, mod calc wi  
brn mrly resdl





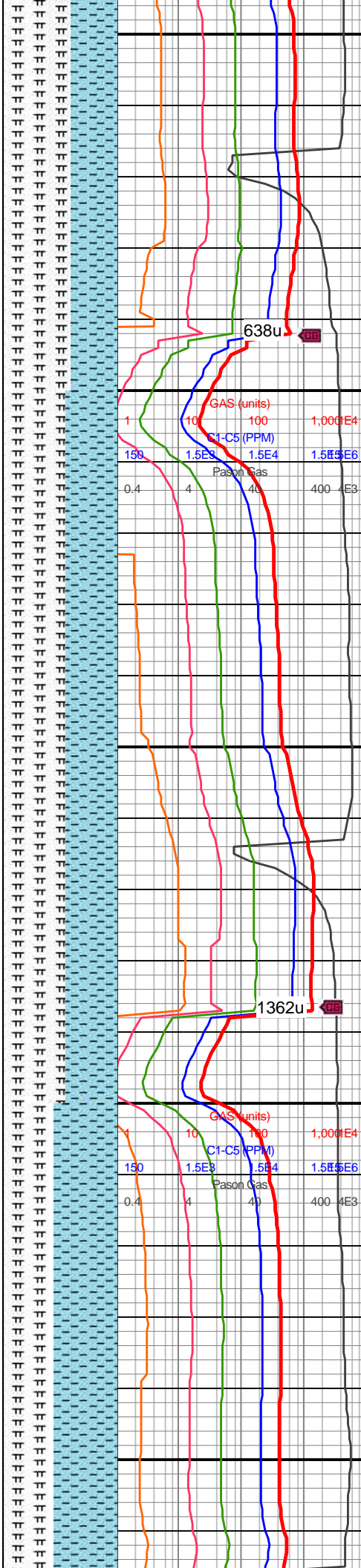
10,150  
10,160  
10,170  
10,180  
10,190  
10,200  
10,210  
10,220  
10,230  
10,240  
10,250  
10,260  
10,270  
10,280  
10,290  
10,300  
10,310  
10,320  
10,330  
10,340  
10,350  
10,360

MW IN: 9.8  
VIS IN: 47  
MW OUT: 9.85  
VIS OUT: 43

WOB: 39klbs  
RPM: 71  
SPM: 204  
SPP: 4,740psi

MD: 10,223'  
TVD: 7,375.21'  
INC: 90.44°  
AZM: 89.22°  
VS: 2,890.87'

MD: 10,318'  
TVD: 7,374.48'  
INC: 90.44°  
AZM: 89.39°  
VS: 2,985.86'



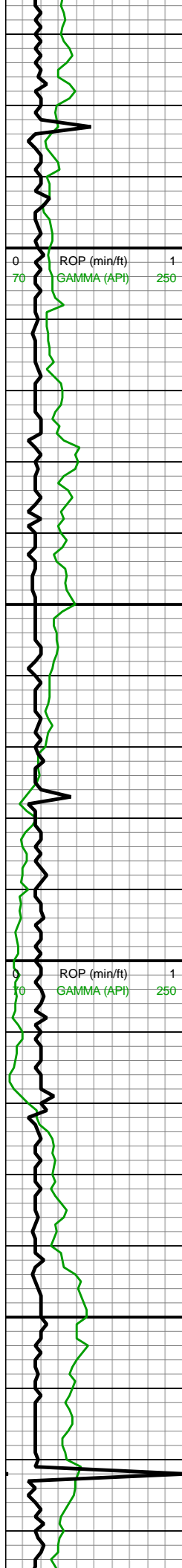
10100-10200 MRLST  
(60%): med gy-dk gy wi  
sp brn marl, frm-brit, sb  
frm ip, l-mod fis sb rd-sb  
blky ctngs, sm arg-sl slty  
tex, tr vf pyr, rr-occ bent,  
mod calc wi brn mrly  
resdl; CHK (40%): med  
gy, lt gy ip, frm, brit, l-mod  
fis sb rd-sb blky-blky  
ctngs, sl slty tex, rr  
forams, hi calc

10200-10300 MRLST  
(55%): med  
gy-gyshbn-dk gy, sb  
frm-frm-brit, sb rd-sb blky  
l-mod fis ctngs, sm  
arg-sl slty tex, tr vf pyr, tr  
bent, mod calc wi brn  
mrly resdl; CHK (45%):  
med gy, lt gy ip, frm, brit,  
l-mod fis sb rd-sb  
blky-blky ctngs, sl slty tex,  
rr forams & tr fos frags, hi  
calc

10300-10400 CHK







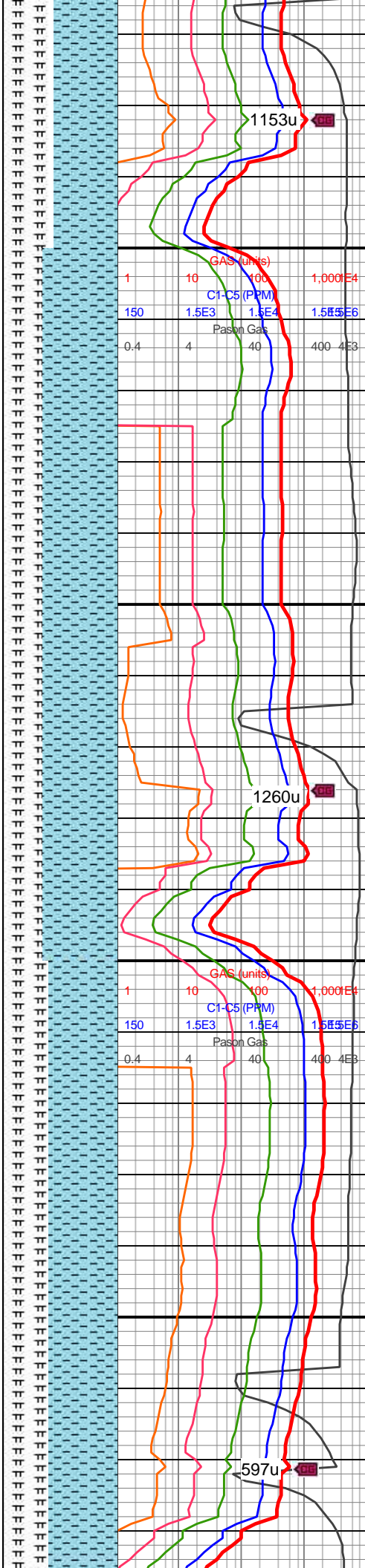
10,370  
10,380  
10,390  
10,400  
10,410  
10,420  
10,430  
10,440  
10,450  
10,460  
10,470  
10,480  
10,490  
10,500  
10,510  
10,520  
10,530  
10,540  
10,550  
10,560  
10,570  
10,580

WOB: 41klbs  
RPM: 71  
SPM: 200  
SPP: 4,620psi

MD: 10,413'  
TVD: 7,373.68'  
INC: 90.53°  
AZM: 88.86°  
VS: 3,080.85'

MW IN: 9.8  
VIS IN: 47  
MW OUT: 9.85  
VIS OUT: 45

MD: 10,507'  
TVD: 7,373.1'  
INC: 90.18°  
AZM: 88.51°  
VS: 3,174.82'

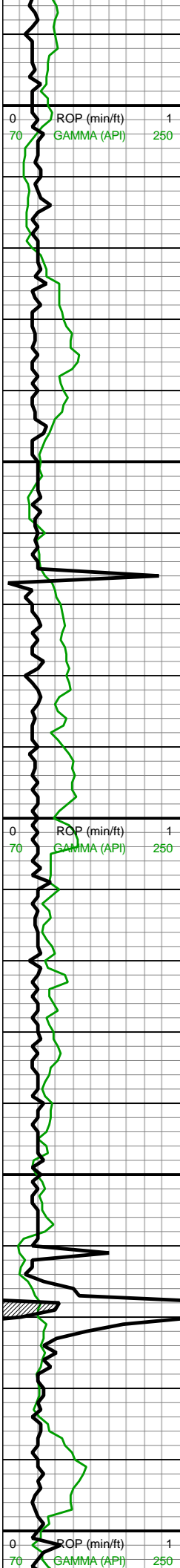


(55%): med gy-dk gy wi f  
wh chky incl & thn chky  
lamn, frm-brit, mod fis sb  
blky-blky ctngs, slty-sl gt  
tex, rr vf pyr, hi calc;  
MRLST (45%): med gy-dk  
gy, frm, brit, sb ang-sb  
blky-blky mod fis ctngs, sl  
slty tex, com vf pyr thru,  
occ pyrc bent, mod calc  
wi brn mrly resdl

10400-10500 CHK  
(65%): med gy-dk gy wi  
occ wh chky incl, rr  
gyshbnm frm, brit, mod  
fis sb blky-blky ctngs,  
sm-sl slty tex rr yel o stn,  
rr forams, tr vf pyr, hi calc;  
MRLST (35%): med gy-dk  
gy-blk ip, sb frm-frm, brit,  
sb rd-sb blky-blky mod fis  
ctngs, sl slty tex, rr bent,  
mod calc wi brn mrly  
resdl

10500-10600 CHK  
(60%): med gy-dk gy, rr  
gyshbn ip, frm-brit, mod  
fis sb blky-blky ctngs,  
sm-sl slty tex, occ f wh  
chky incl ip, rr yel o stn, rr  
forams, rr vf pyr, tr fos  
frags, hi calc; MRLST  
(40%): med gy-dk gy blky





WOB: 40klbs  
RPM: 70  
SPM: 200  
SPP: 4,670psi

MD: 10,602'  
TVD: 7,372.4'  
INC: 90.66°  
AZM: 88.25°  
VS: 3,269.79'

MD: 10,697'  
TVD: 7,371.12'  
INC: 90.88°  
AZM: 87.99°  
VS: 3,364.73'

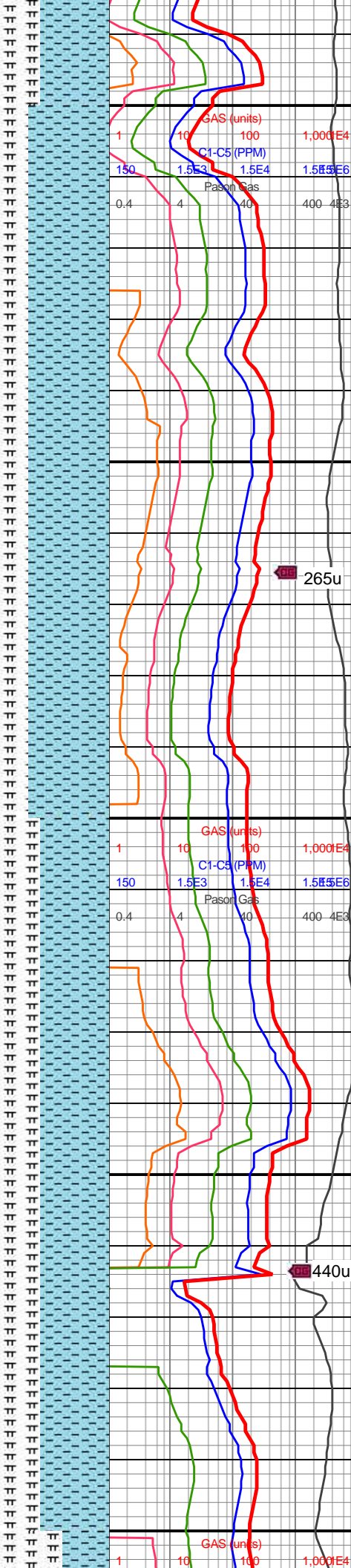
MW IN: 9.8  
VIS IN: 45  
MW OUT: 9.85  
VIS OUT: 44

TOOH after  
motor failure  
16:00hrs 8/18/18

MINDEPTH 8/19/18

Bit #: 2  
Type: U516M  
Size: 8 1/2  
Depth In: 10,763'  
Depth Out: 11,835'  
Hours: 4.8 hrs  
Avg Ft/Hr: 223 'h  
Jets: 6x13  
S/N: 36052

MD: 10,791'  
TVD: 7,368.56'

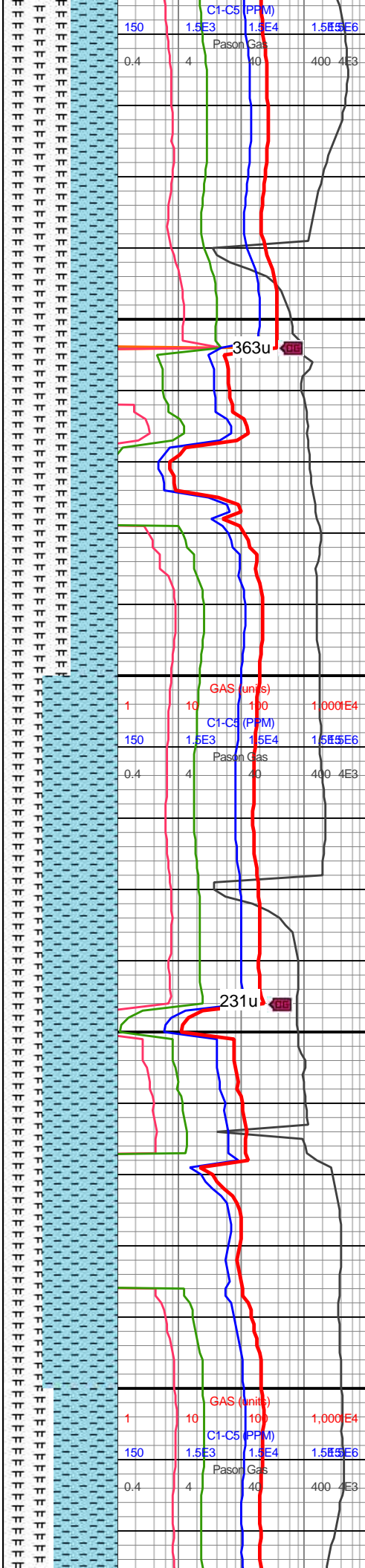
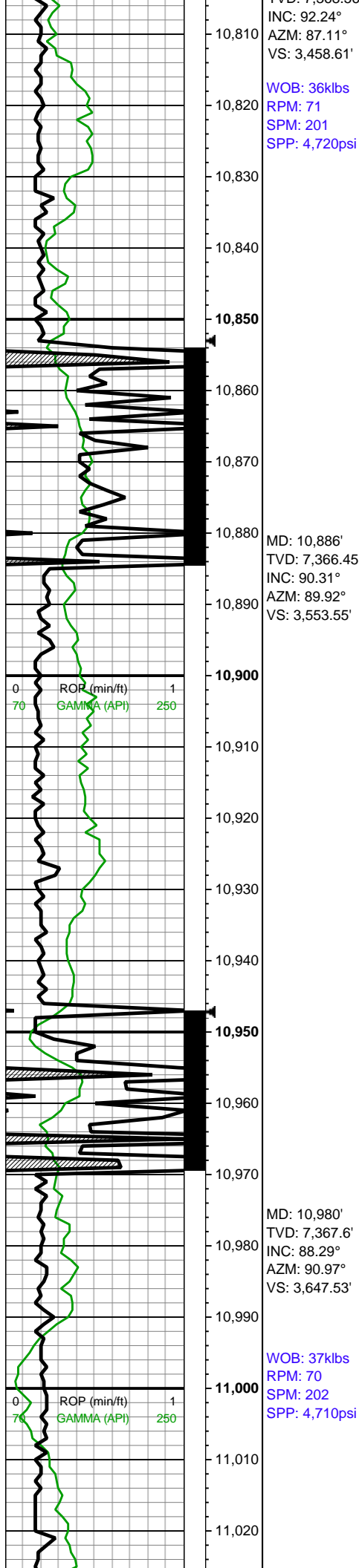


(40%): med gy-dk gy-blk,  
sb frm-frm, brit ip, med-hi  
fis sb rd-sb blk-y-blky-sb  
ply ctngs, sl slty tex, rr  
bent, mod calc

10600-10700 CHK  
(70%): lt gyshbn, occ lt  
gy-dk gy wi occ chky incl,  
sft-sb frm-frm-brit, sb  
blk-y, tr vf pyr, hi calc;  
MRLST (30%): predy dk  
gy, occ med-dk gyshbn,  
frm-hd-brit, sm sl slty tex,  
rgh tex ip, mod calc

10700-10800 CHK  
(60%): med gy-dk  
gy-gyshbn frm-brit, sb  
blk-y-blky mod fis ctngs,  
sm-sl slty tex, occ f wh  
chky incl ip, rr yel o stn, rr  
forams, rr vf pyr, tr fos  
frags, hi calc; MRLST  
(40%): med gy-dk gy-blk,  
sb frm-frm, brit ip, med-hi  
fis sb rd-sb blk-y-blky-sb  
ply ctngs, sl slty tex, rr  
bent, mod calc

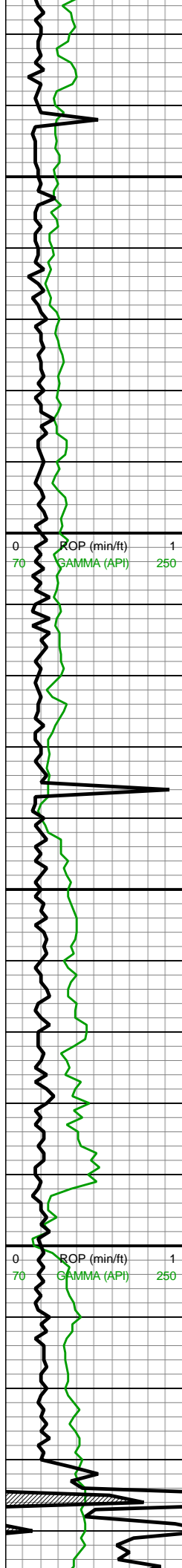




10800-10900 MRLST  
(60%): med gy-dk  
gy-gyshbn wi sp brn marl  
& occ yel o stn,  
frm-brit-crunchy, sb frm  
ip, l-mod fis sb rd-sb blk  
ctngs, sm arg-sl slty tex,  
tr vf pyr, tr bent, mod calc  
wi brn mrly resdl; CHK  
(40%): med gy-dk gy wi rr  
wh chky incl, l-mod fis sb  
rd-sb blk-blky-ctngs, sl  
slty tex, rr forams, hi calc

10900-11000 CHK  
(60%): med gy-dk gy- wi f  
wh chky incl & occ yel o  
stn, frm-brit, sb rd-sb blk  
l-mod fis ctngs, sm  
arg-sl slty tex, wxy-dul rthy  
lstr, rr vf pyr, hi calc;  
MRLST (40%): med gy-dk  
gy, frm-brit, med-hi fis sb  
rd-sb blk-blky-sb plty  
ctngs, sl slty tex, mod  
calc wi brn mrly resdl



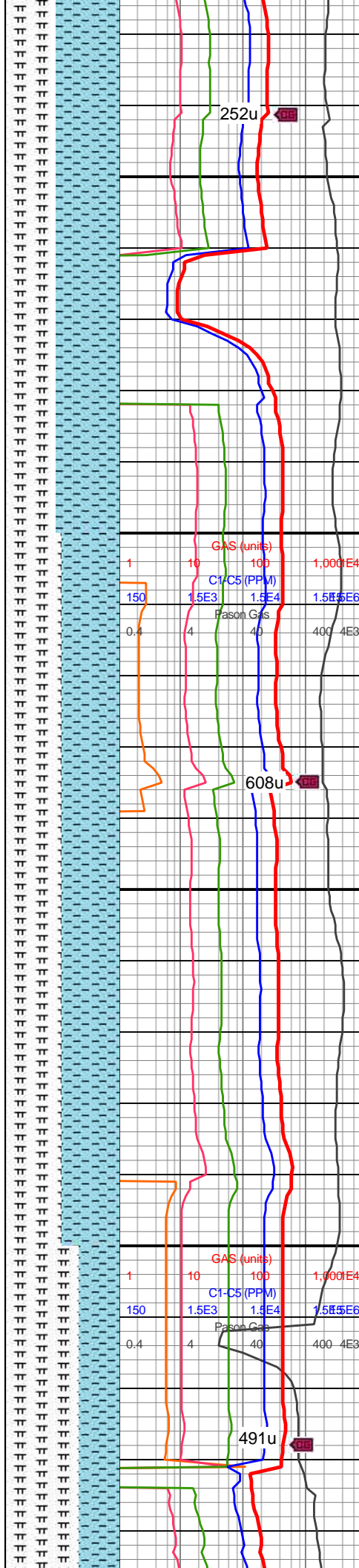


MW IN: 9.9  
VIS IN: 51  
MW OUT: 10.0  
VIS OUT: 49

MD: 11,075'  
TVD: 7,371.24'  
INC: 87.32°  
AZM: 90.09°  
VS: 3,742.45'

MD: 11,169'  
TVD: 7,376.67'  
INC: 86.05°  
AZM: 90.27°  
VS: 3,836.29'

WOB: 37klbs  
RPM: 70  
SPM: 200  
SPP: 4,730psi



252u

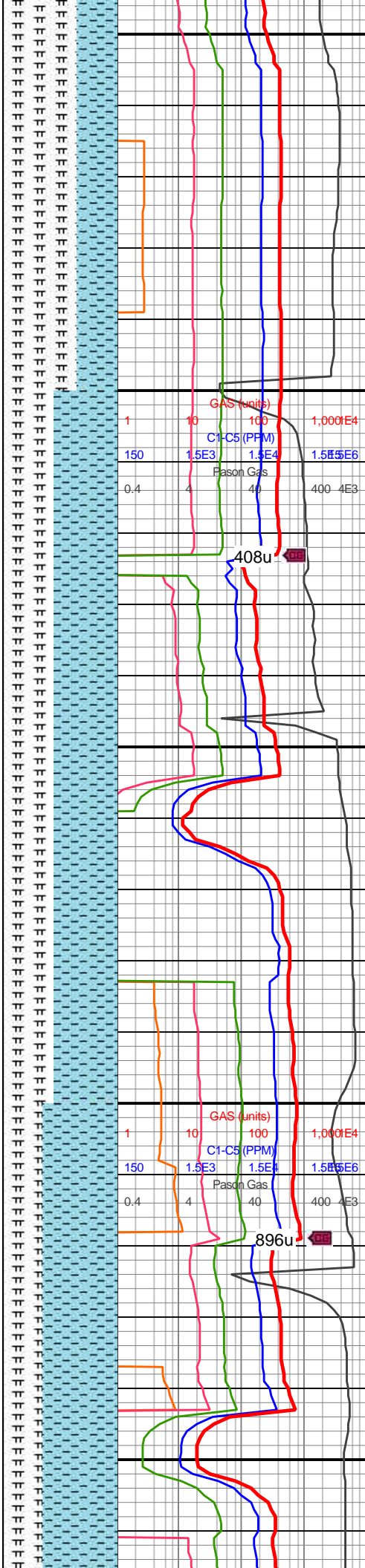
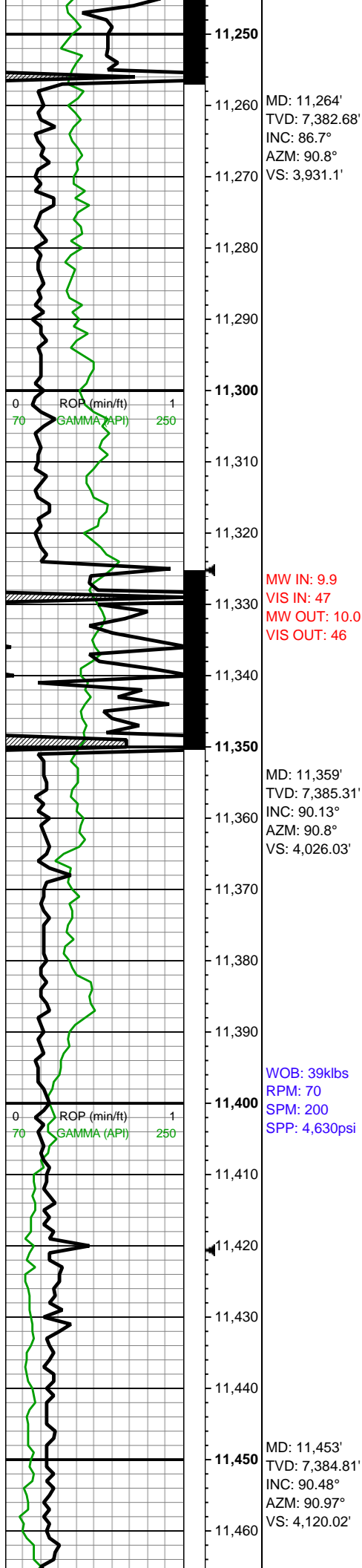
608u

491u

11000-11100 CHK  
(55%): med gy-dk gy- wi f  
wh chky incl & occ yel o  
stn, frm-brit, sb rd-sb blk  
l-mod fis ctngs, sm  
arg-sl slty tex, wxy-dul rth  
lstr, rr vf pyr, hi calc;  
MRLST (35%): med gy-dk  
gy, frm-brit, med-hi fis sb  
rd-sb blk-bkly-sb plty  
ctngs, sl slty tex, mod  
calc wi brn mrly resdl

11100-11200 CHK  
(50%): med gy-dk gy, f wh  
chky incl ip,  
frm-brit-crunchy, sb rd-sb  
blk l-mod fis ctngs, sm  
arg-sl slty tex, wxy-dul rth  
lstr, rr vf pyr, hi calc;  
MRLST (50%): dk gy-v dk  
gy, frm, crunchy-brit, sb  
frm ip, mod fis sb  
blk-bkly ctngs, sm arg-sl  
slty tex, tr vf pyr, rr tn bent,  
mod calc wi brn mrly  
resdl

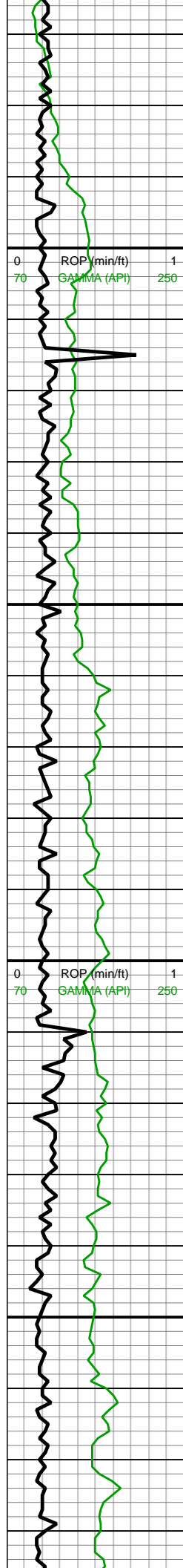




11200-11300 MRLST  
(65%): dk gy-v dk gy, frm,  
crunchy-brit, sb frm ip,  
mod fis sb blkyl-blky  
ctngs, sm arg-sl slty tex,  
tr vf pyr, rr tn bent, mod  
calc wi brn mrly resdl;  
CHK (35%): med gy-dk  
gy wi rr f wh chky incl,  
crunchy-brit, frm, l-mod  
fis sb rd-sb blkyl-blky  
ctngs, sl slty tex, rr  
forams, hi calc

11300-11400 CHK  
(55%): lt gy, med gy ip,  
mod fis sb blkyl-blky  
ctngs, frm-brit-crunchy ip,  
sm-sl slty tex, com f wh  
chky incl thru, rr yel o stn,  
rr vf pyr, hi calc; MRLST  
(45%): dk gy-v dk gy,  
frm-hd, brit, med-hi fis sb  
blkyl-blky-sb plty ctngs, sl  
slty tex, rr wh bent, rr yel o  
stn, mod calc

11400-11500 CHK

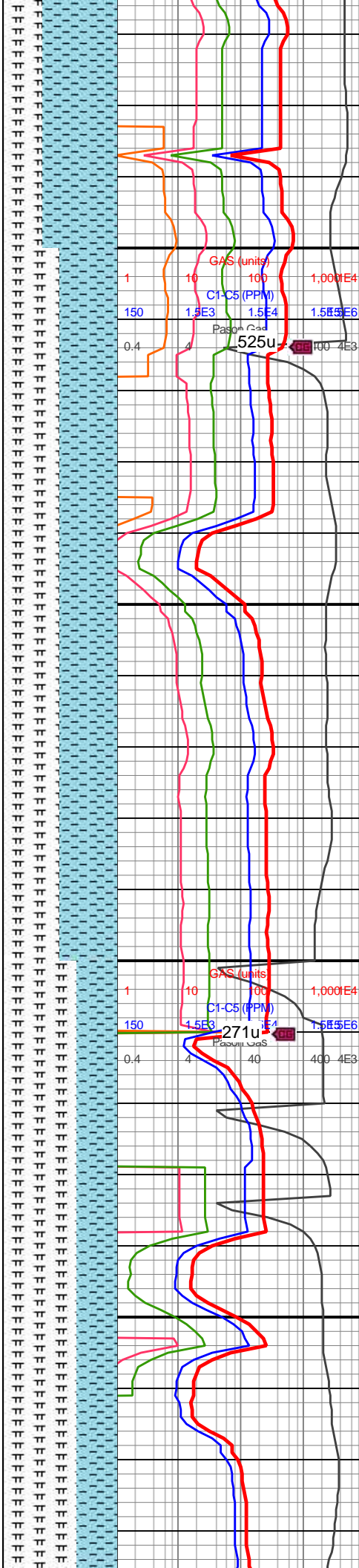


MW IN: 9.9  
VIS IN: 47  
MW OUT: 9.95  
VIS OUT: 45

MD: 11,549'  
TVD: 7,383.37'  
INC: 91.23°  
AZM: 90.45°  
VS: 4.216'

WOB: 33klbs  
RPM: 70  
SPM: 200  
SPP: 4,730psi

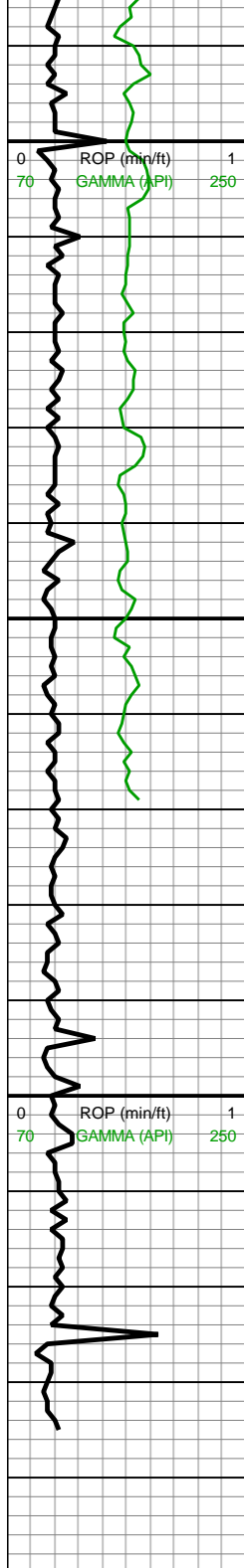
MD: 11,643'  
TVD: 7,381.72'  
INC: 90.79°  
AZM: 90.45°  
VS: 4.309.98'



(65%): predy lt gy, med gy  
ip, com f wh chky incl,  
mod fis, sb blkly-bkly,  
frm-brit, crunchy ip, sm-sl  
sly tex, rr yel o stn, rr vf  
pyr, hi calc; MRLST  
(35%): dk gy-v dk gy,  
frm-hd, brit, med-hi fis sb  
bkly-bkly-sb pty ctngs, sl  
sly tex, rr wh bent, rr yel o  
stn. mod calc

11500-11600 MRLST  
(50%): dk gy-v dk gy,  
frm-hd, med-hi fis sb  
blky-blky ctngs, sm-sl slty  
tex, occ wh bent, mod  
calc wi brn mrly resdl;  
CHK (50%): predy lt gy,  
med gy ip, com f wh chky  
incl thru, mod fis, sb  
blky-blky, frm-brit, crunchy  
ip, sm-sl slty tex, rr vf pyr,  
hi calc

11600-11700 MRLST  
(65%): dk gy-v dk gy,  
frm-hd, brit, med-hi fis sb  
blky-blky-sb plty ctngs, sl  
sly tex, rr wh bent, rr yel o  
stn, mod calc; CHK  
(35%): predy lt gy, med gy  
in, com f wh blk, ind



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  
11,840  
11,850

MD: 11,737'  
TVD: 7,381.57'  
INC: 89.39°  
AZM: 87.81°  
VS: 4,403.96'

MD: 11,774'  
TVD: 7,382.08'  
INC: 89.03°  
AZM: 87.63°  
VS: 4,440.93'

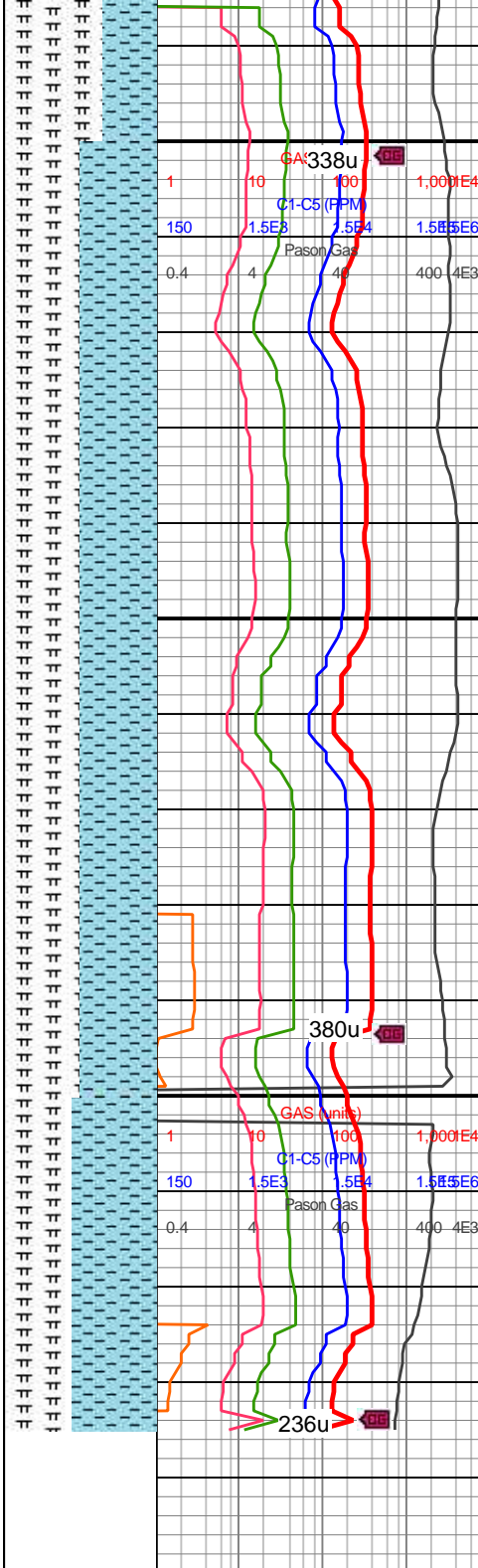
MW IN: 9.85  
VIS IN: 47  
MW OUT: 9.9  
VIS OUT: 46

WOB: 33klbs  
RPM: 70  
SPM: 202  
SPP: 4,360psi

**Reach TD @  
13:35hrs on  
8/19/18**

**\*Bit Projection\***

MD: 11,835'  
TVD: 7,383.11'  
INC: 89.03°  
AZM: 87.63°  
VS: 4,501.87'



ip, com f wh chky incl,  
mod fis, sb blkly-blky,  
frm-brit, crunchy ip, sm-sl  
silty tex, rr yel o stn, rr vf  
pyr, hi calc

11700-11800 MRLST  
(50%): dk gy-v dk gy,  
frm-hd, med-hi fis sb  
blkly-blky ctngs, sm-sl silty  
tex, occ wh bent, mod  
calc wi brn mrly resdl;  
CHK (50%): predy lt gy,  
med gy ip, com f wh chky  
incl thru, mod fis, sb  
blkly-blky, frm-brit, crunchy  
ip, sm-sl silty tex, rr vf pyr,  
hi calc

11800-11835 CHK  
(55%): dk gy wi f wh chky  
incl & forams, lt gy ip,  
frm-brit mod fis sb  
blkly-blky ctngs, sm-sl silty  
tex, occ wh sp forams, rr  
vf pyr, hi calc; MRLST  
(45%): dk gy-v dk gy wi sp  
brn marl incl & rr yel o  
stn, frm-hd, brit, crunchy  
ip, med-hi fis sb blkly-blky  
ctngs, sl silty tex, com  
wh-tn bent, mod calc wi  
brn mrly resdl

