



Scale: 5" / 100'
Measured Depth Log

Well Name HWY52 4V-32H-O268

Location Sec. 32 T2N R68W

State Colorado

County Weld

Country USA

Rig Number Ensign 140

API Number 05123431130000

AFE # 16190432

Geographic Region Rockies

Field Wattenberg

Spud Date 8/27/2017

Drilling Completed 8/30/2017

Surface Coordinates Lat/Long: 40.089353/-105.024535

SHL: Sec: 32 Twp: 2N 68W
Footage: 598 FSL 1914 FEL

Bottom Hole Coordinates Proposed BHL: Sec: 32 Twp: 2N 68W
Footages: 460 FNL 300 FEL

Ground Elevation 4,992'

K.B. Elevation 5,015'

Logged Interval 6,800' **To** 12,092'

Total Depth 12,092'

Formation Niobrara B Chalk

Type of Drilling Fluid Syntehtic Oil Based Mud

Operator

Company Crestone Peak Resources

Address 370 17th Street #2170
Denver, CO 80202



CRESTONE PEAK

Geologist

Name John Ready

Company Crestone Peak Resources

Address 370 17th Street #2170
Denver, CO 80202



CRESTONE PEAK
RESOURCES

Zone Color Coding

Oil	Condensate	Gas
Note	Core	Pressure
Error	Water	Seal

Other

Loggers: Nick Watkins / Mark Gross

Services Provided: 2-Man Mudlogging / Geosteering

Equipment: ML-556

Contractor: ALS Empirica
6510 Guhn Road
Houston, TX 77040

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

F FOSSIL

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

— ARGILLACEOUS

- ARGILLITE GRAIN
- BENTONITE
- BITUMENOUS SUBSTANCE
- BRECCIA FRAGMENTS
- CALCAREOUS
- CARBONACEOUS FLAKES
- CHTDK
- CHLTl
- COAL - THIN BEDS
- DOLOMITIC

∨ GLAUCONITE

- GYPSIFEROUS
- HEAVY MINERAL
- KAOLIN
- MARLSTONE
- MINERAL CRYSTALS
- NODULES
- PHOSPHATE PELLETS
- PYRITE
- SALT CAST
- SANDY

Stringer

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

♡ ECHINOID

🐟 FISH

🔍 FORAMINIFERA

Minerals

/// ANHYDRITIC

+ FELDSPAR

● FERRUGINOUS PELLET

👉 FERRUGINOUS

^ SILICEOUS

≡ SILTY

∨ TUFFACEOUS

— SHALE STRINGER

▬ SILTSTONE STRINGER

Other Symbols

Oil Show

☐ DEAD

● EVEN

○ QUESTIONABLE

⦿ SPOTTED STAINING

Porosity

E EARTHY

▣ FENESTRAL

F 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

MINDEPTH MN DEPTH

↔ NORMAL FAULT

● OIL SHOW

↕ OVERTURNED STRATA

↔ REVERSE FAULT

◀ SIDEWALL CORE (LEFT)

▶ SIDEWALL CORE (RIGHT)

▨ SLIDE

DS SURVEY

TRIP GAS

◀ WIRELINE TESTED - LEFT

▶ WIRELINE TESTED - RT

Rounding

▲ ANGULAR

▣ ROUNDED

▣ SUBANG

▣ SUBRND

Textures

BS BOUNDSTONE

○ CHALKY

⊗ CRYPTOXLN

E EARTHY

FX FINELYXLN

BS GRAINSTONE

L LITHOGRAPHIC

MX MICROXLN

MS MUDSTONE

PS PACKSTONE

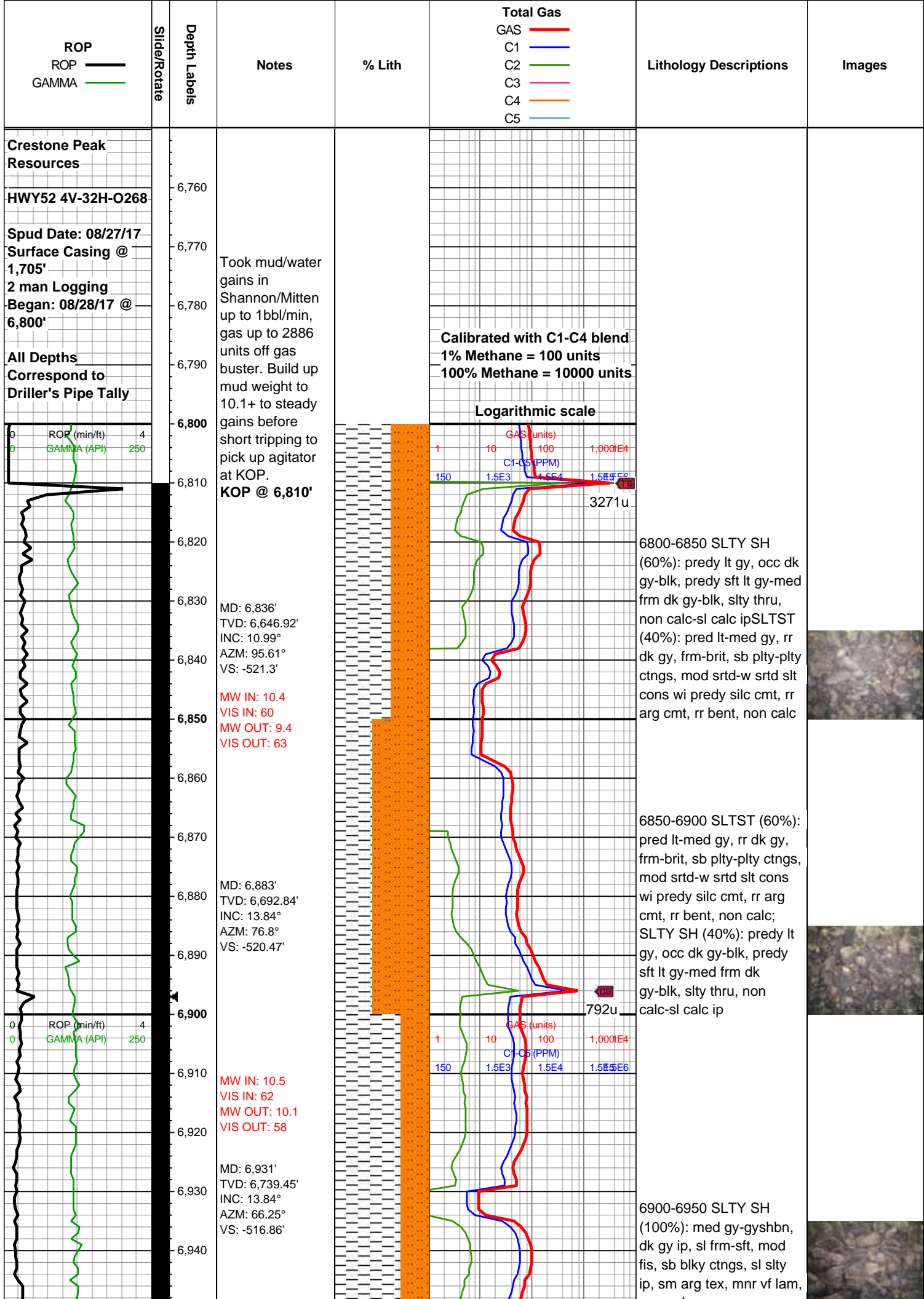
WS WACKESTONE

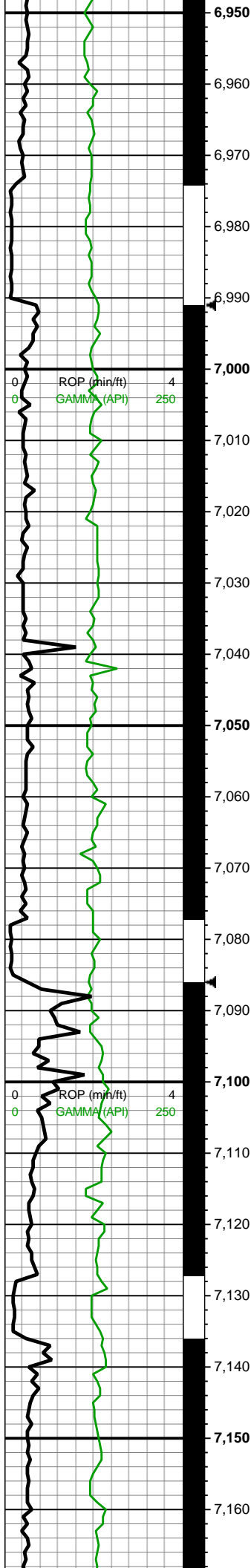
Sorting

M MODERATE

P POOR

W WELL





MD: 6,978'
 TVD: 6,785.18'
 INC: 13.05°
 AZM: 49.56°
 VS: -511.16'

WOB: 22.2klbs
 RPM: 0
 SPM: 178
 SPP: 3,193psi

MW IN: 10.1
 VIS IN: 65
 MW OUT: 10.1
 VIS OUT: 63

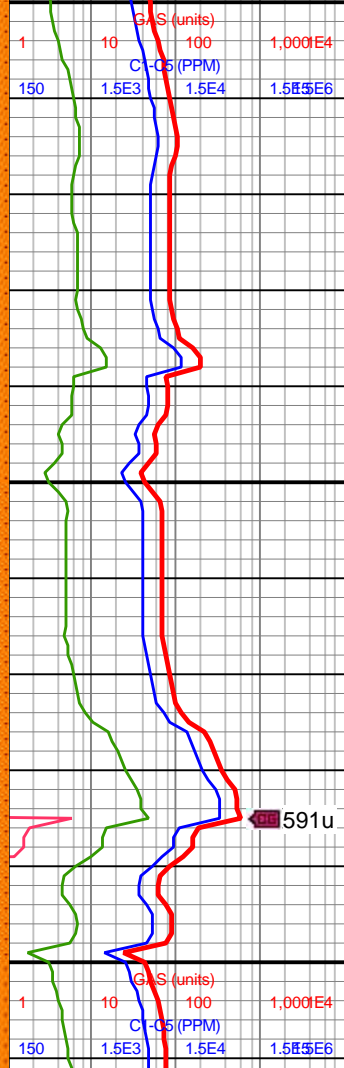
MD: 7,025'
 TVD: 6,830.81'
 INC: 14.81°
 AZM: 34.09°
 VS: -502.75'

MD: 7,072'
 TVD: 6,875.87'
 INC: 18.24°
 AZM: 28.2°
 VS: -491.3'

MD: 7,120'
 TVD: 6,921.09'
 INC: 20.96°
 AZM: 23.45°
 VS: -476.8'

MW IN: 10.15
 VIS IN: 62
 MW OUT: 10.1
 VIS OUT: 60

MD: 7,167'
 TVD: 6,964.5'
 INC: 24.04°



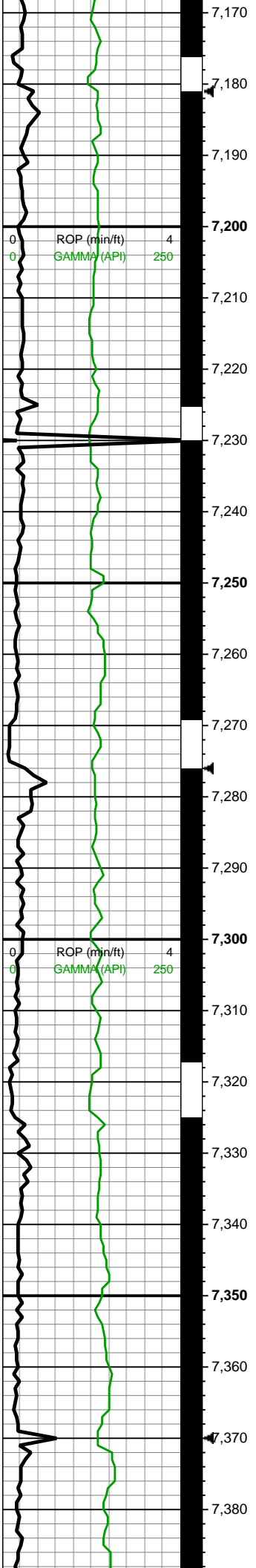
6950-7000 SLTY SH
 (100%): predy med gy, lt gy-gyshbn, dk gy ip, sft-mod frm, pred sb blk- tab ctngs, slty thru, vf lam, rr sdy intbds, non calc

7000-7050 SLTY SH
 (100%): lt gy-med gy, mot gyshbn, dk gy, mod frm-sl sft, sb blk- tab occ plty ctngs, sm arg-sl slty tex, mnr SLTST grd, tr sdy grd, non calc

7050-7100 SLTY SH
 (100%): med gy-gyshbn, mot lt gy, dk gy ip, sb blk- sb plty, frm, brit, sl slty-sm tex, tr sdy, tr pp mic pyr, non calc

7100-7150 SLTY SH
 (100%): predy gyshbn-lt gy, mot med gy, dk gy ip, sl frm-sl sft, pred blk- sb tab, occ slty, slty-sl abrvsv tex, sl micmica ip, non-sl calc





AZM: 23.1°
VS: -460.29'

WOB: 16klbs
RPM: 0
SPM: 184
SPP: 3,358psi

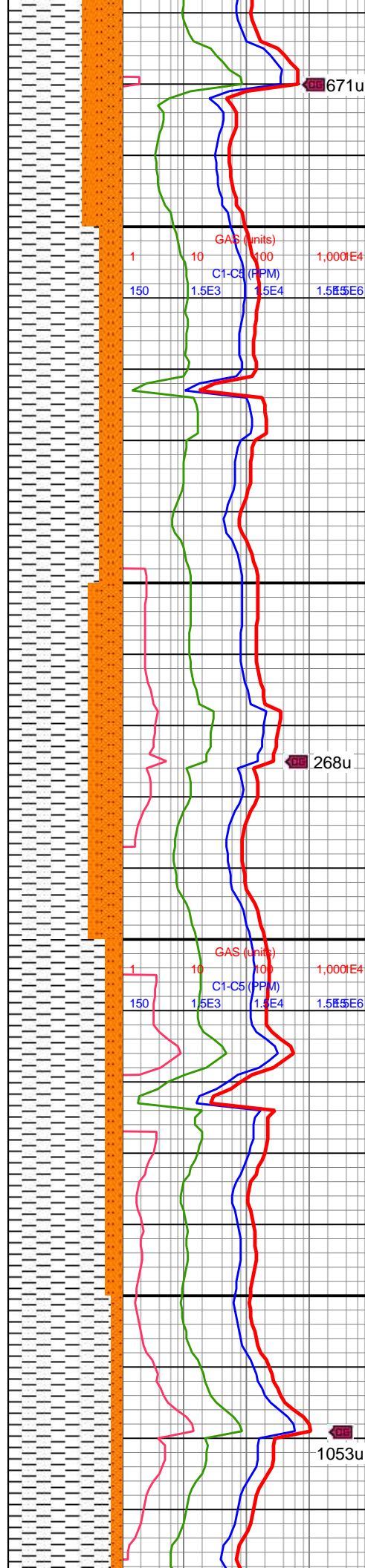
MD: 7,215'
TVD: 7,007.72'
INC: 27.51°
AZM: 22.13°
VS: -441.03'

MW IN: 10.2
VIS IN: 60
MW OUT: 10.15
VIS OUT: 59

MD: 7,262'
TVD: 7,049.01'
INC: 29.58°
AZM: 19.15°
VS: -420.02'

MD: 7,310'
TVD: 7,090.38'
INC: 31.33°
AZM: 19.41°
VS: -397.07'

MW IN: 10.2
VIS IN: 62
MW OUT: 10.15
VIS OUT: 59



671u

268u

1053u

7150-7200 SLTY SH
(100%): lt gy-gyshbn, mot med gy, sl frm-sft, mod fis, sb tab-sb blkly, vf lam, slty-sl cly tex, scat micmica, non calc

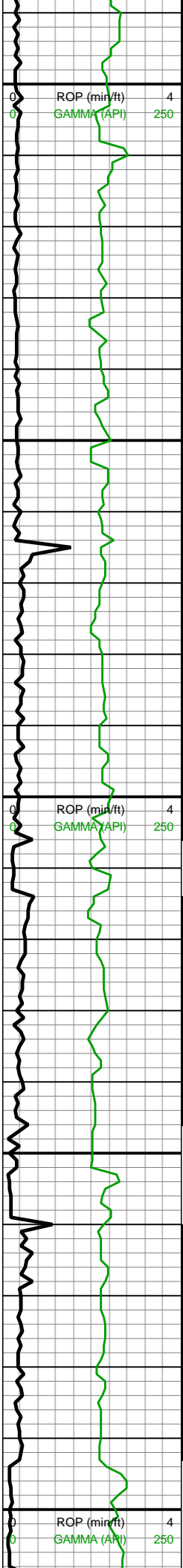
7200-7250 SLTY SH
(100%): lt gy-gyshbn, scat med gy, sb tab-sb blkly, sl frm, mod fis, dull, com v thnly lam, non-sl calc, micmica, rr diss pyr

7250-7300 SLTY SH
(100%): ltgy -med gy, occ gyshbn, dk gy ip, sl frm-sl sft, sb pty-sb blkly, slty-sl cly tex, mod fis, scat micmica, non calc

7300-7350 SLTY SH
(100%): predy gyshbn-lt gy, mot med gy, dk brn ip, sl frm-frm, blkly-sb tab ctngs, non-sl calc, occ slty, sl micmica, vf lam

7350-7400 SLTY SH
(100%): lt gy-gyshbn, med gy, lt brn, mot-stri,





WOB: 19.7klbs
 RPM: 0
 SPM: 184
 SPP: 3,496psi

MD: 7,405'
 TVD: 7,167.93'
 INC: 39.11°
 AZM: 19.58°
 VS: -345.49'

MD: 7,452'
 TVD: 7,203.02'
 INC: 44.25°
 AZM: 20.55°
 VS: -316.16'

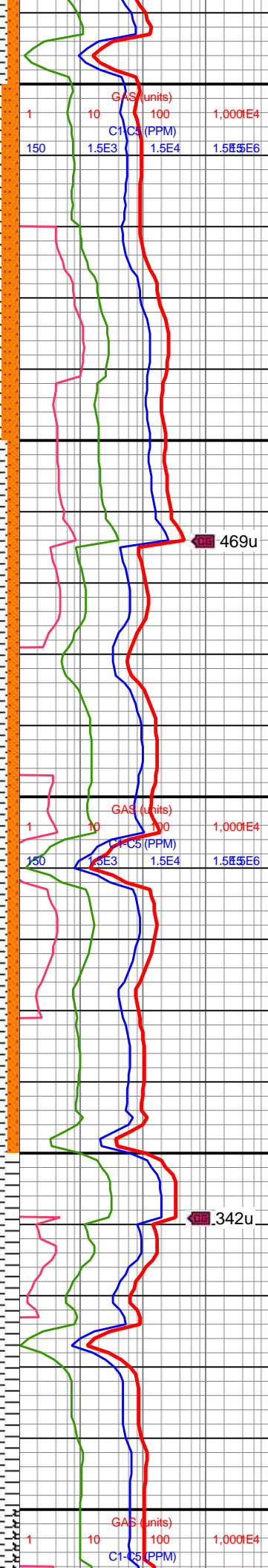
MW IN: 10.25
 VIS IN: 62
 MW OUT: 10.2
 VIS OUT: 59

MD: 7,500'
 TVD: 7,236.05'
 INC: 48.78°
 AZM: 18.79°
 VS: -283.38'

MD: 7,547'
 TVD: 7,266'
 INC: 52.03°
 AZM: 16.68°
 VS: -248.91'

MINDEPTH 8/29/17
 MD: 7,594'
 TVD: 7,293.95'
 INC: 54.98°
 AZM: 14.84°
 VS: -212.56'

Sharon Springs
7606' / 7301' TVD



blky-tab ctngs, sl frm-frm,
 sl brit, sme plty, vf lam,
 slty-cly tex, rgh ip,
 micmica, non calc

7400-7450 SLTY SH
 (100%): gyshbn-lt gy, mot
 med gy, lam dk brn, sl
 frm-frm, stri, blky-sb tab
 ctngs, splt ip, vf lam, occ
 slty, sl micmica, mnr
 imbd/dissm mic pyr,
 non-sl calc

7450-7500 SLTY SH
 (100%): gyshbn-med gy,
 mot lt gy, lam dk brn,
 blky-sb tab ctngs, sl
 frm-frm, stri, vf lam, sl
 slty tex, sl micmica, non-sl
 calc, mnr imbd/dissm
 mic pyr

7500-7550 SLTY SH
 (100%): med-dk gy, occ
 bnshgy, sme dk gy, mot,
 sb plty-sb blky, sb hd-v
 frm, mod-ply fis, slty tex, v
 wkly calc, scat micmica

7550-7600 SH (100%):
 dk gy-gyshbn, mot med
 gy, sb blky-splt ctngs, sl
 hd-frm, sl slty thru, tr
 imbd/pp mic pyr, tr BENT
 cls/incl, non-sl calc



GAS (units)
 1 10 100 1,000E4

C1-C5 (PPM)
 150 1.5E3 1.5E4 1.5E5E6

469u

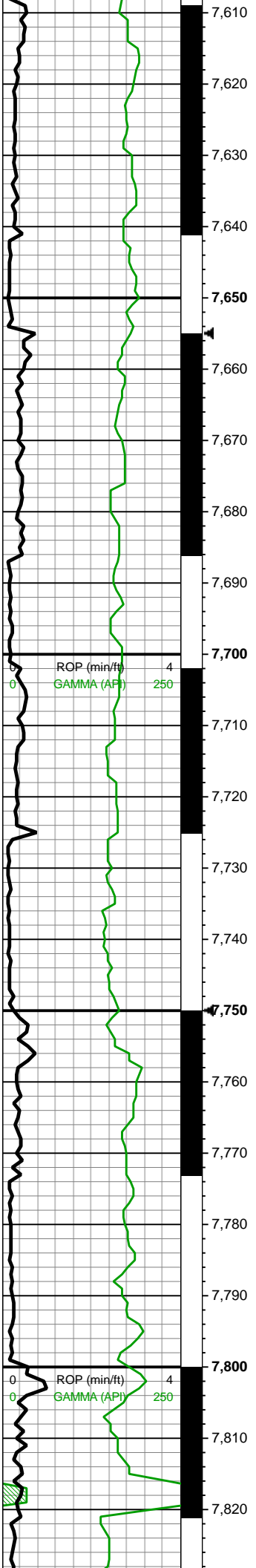
GAS (units)
 1 10 100 1,000E4

C1-C5 (PPM)
 150 1.5E3 1.5E4 1.5E5E6

342u

GAS (units)
 1 10 100 1,000E4

C1-C5 (PPM)



WOB: 32.9klbs
RPM: 31
SPM: 178
SPP: 3,692psi

MD: 7,641'
TVD: 7,319.64'
INC: 58.76°
AZM: 12.82°
VS: -174.36'

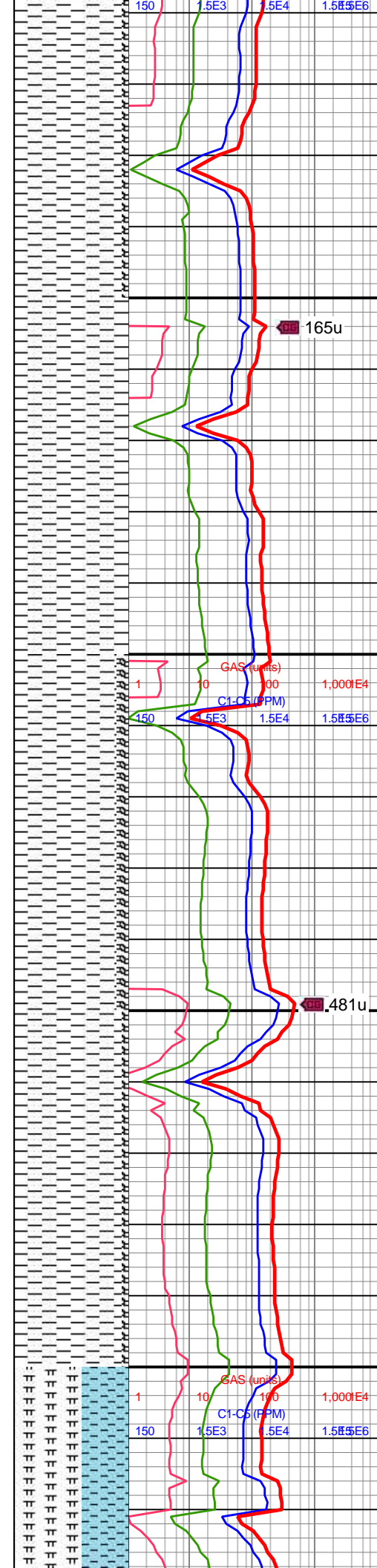
MD: 7,689'
TVD: 7,343.2'
INC: 62.45°
AZM: 10.53°
VS: -133.42'

MW IN: 10.25
VIS IN: 60
MW OUT: 10.25
VIS OUT: 59
MD: 7,736'
TVD: 7,363.84'
INC: 65.44°
AZM: 7.81°
VS: -91.75'

MD: 7,784'
TVD: 7,383.04'
INC: 67.41°
AZM: 6.75°
VS: -48.12'

WOB: 28.2klbs
RPM: 0
SPM: 178
SPP: 3,269psi

Niobrara A
7831' / 7401' TVD



7600-7650 SH (95%):
med gy-med gyshbn, dk gy, frm-sl hd, sb blkly-tab ctngs, sme splt, vf lam, mnr BENT incl/intbds, sl slty thru, tr pp mic pyr, non calc; BENT (5%): crm-wht, sft, intbdd wi SH, non calc

7650-7700 SH (100%):
med gy-med gyshbn, dk gy, mot-stri, frm-sl hd, sb blkly-splt ctngs, vf lam, sl slty thru, tr pp mic pyr, mnr BENT intbds, non calc

7700-7750 SH (90%):
med gy-dk gyshbn, mot dk gy, sb blkly-sb splt ctngs, frm-sl hd, sl slty thru, vf lam, mnr BENT intbds, tr pp/dissm mic pyr, non calc; BENT (10%): crm-wht, sft, intbdd wi SH, non calc

7750-7800 SH (95%):
med gy-gyshbn, dk gy, sl frm-frm, sb blkly-sb tab ctngs, tr dissm/pp mic pyr, sl slty tex, non calc; BENT (5%): wh-offwht, mot crm, sft-med frm, water solu, non calc

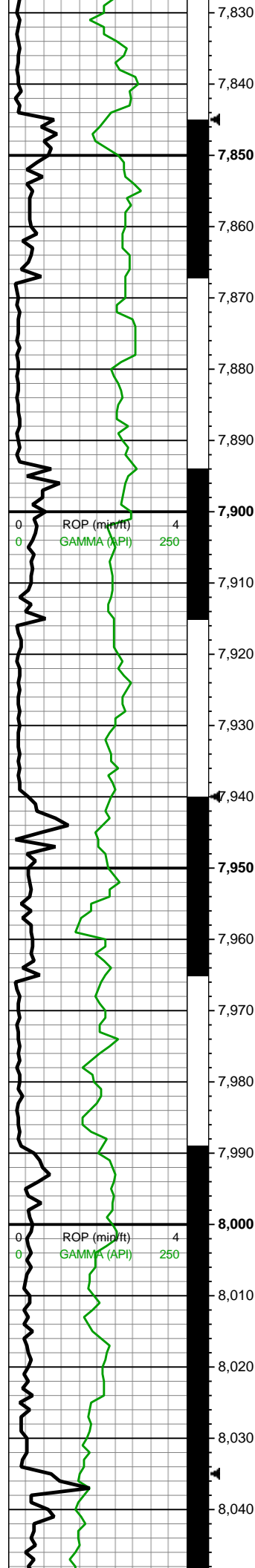
7800-7850 CHK (60%):
gyshbn-med gy, mot-stri,



165u

1481u

1 10 100 1,000E4
150 1.5E3 1.5E4 1.5E5E6



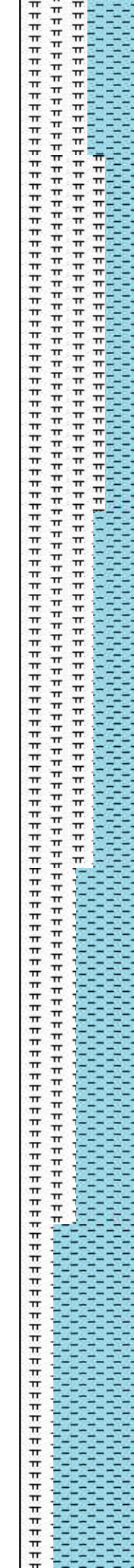
MD: 7,831'
 TVD: 7,400.63'
 INC: 68.64°
 AZM: 4.47°
 VS: -4.76'

MD: 7,879'
 TVD: 7,417.29'
 INC: 70.75°
 AZM: 1.74°
 VS: 40.18'

MD: 7,926'
 TVD: 7,431.94'
 INC: 72.91°
 AZM: 0.95°
 VS: 84.82'

MD: 7,974'
 TVD: 7,445.47'
 INC: 74.36°
 AZM: 1.57°
 VS: 130.86'

MD: 8,021'
 TVD: 7,456.55'
 INC: 78.35°
 AZM: 359.9°
 VS: 176.52'



493u

394u

584u

frm, blk-y-sb tab ctngs, sm-chky tex, hi calc; MRLST (40%): dk gy-dk gyshbn, sb blk-y-sb tab, frm-sl hd, sm arg tex, intbdd CHK, tr diss mic pyr, mod-hi calc

7850-7900 MRLST (75%): dk gy-dk gyshbn, sl hd, sb blk-y-splt ctngs, mnr Chk intbds, brit, mod calc, tr diss mic pyr; CHK (25%): gyshbn-med brn, sl frm-brit, sb blk-y-sb tab ctngs, chky tex, tr vf lam, hi calc

7900-7950 MRLST (65%): dk gy-dk gyshbn, sb blk-y-splt ctngs, sl hd, brit, mnr Chk intbds, tr diss mic pyr, mod-hi calc; CHK (35%): med gy-gyshbn, mot, sb blk-y-sb tab ctngs, sl frm-frm, brit, mnr vf lam, hi calc

7950-8000 CHK (50%): gyshbn, mot med brn, med gy, stri, chky tex, hd-frm, blk-y-sb tab ctngs, tr free CHK, hi calc; MRLST (50%): dk gy-dk gyshbn, frm-sl hd, sb blk-y-sb tab, sm arg tex, intbdd CHK, mod-hi calc, tr diss mic pyr

8000-8050 CHK (70%): med gy-gyshbn, brit, sb blk-y-sb tab ctngs, sl frm-frm, mnr vf lam, tr CHK incl, hi calc; MRLST (30%): dk gy-dk gyshbn, sb blk-y-splt ctngs, brit, sl hd, mnr CHK intbds, tr pp



Niobrara B
 7978' / 7447' TVD

WOB: 38.2kbs
 RPM: 0
 SPM: 176
 SPP: 3,494psi

mic pyr, mod calc

MD: 8,068'
TVD: 7,463.96'
INC: 83.5°
AZM: 0.6°
VS: 222.92'

MW IN: 10.3
VIS IN: 59
MW OUT: 10.25
VIS OUT: 57

MD: 8,115'
TVD: 7,467.8'
INC: 87.14°
AZM: 2.01°
VS: 269.74'

MD: 8,163'
TVD: 7,470.34'
INC: 86.79°
AZM: 0.95°
VS: 317.65'

WOB: 36kbs
RPM: 61
SPM: 180
SPP: 3,886psi

MW IN: 10.3
VIS IN: 59
MW OUT: 10.25
VIS OUT: 56

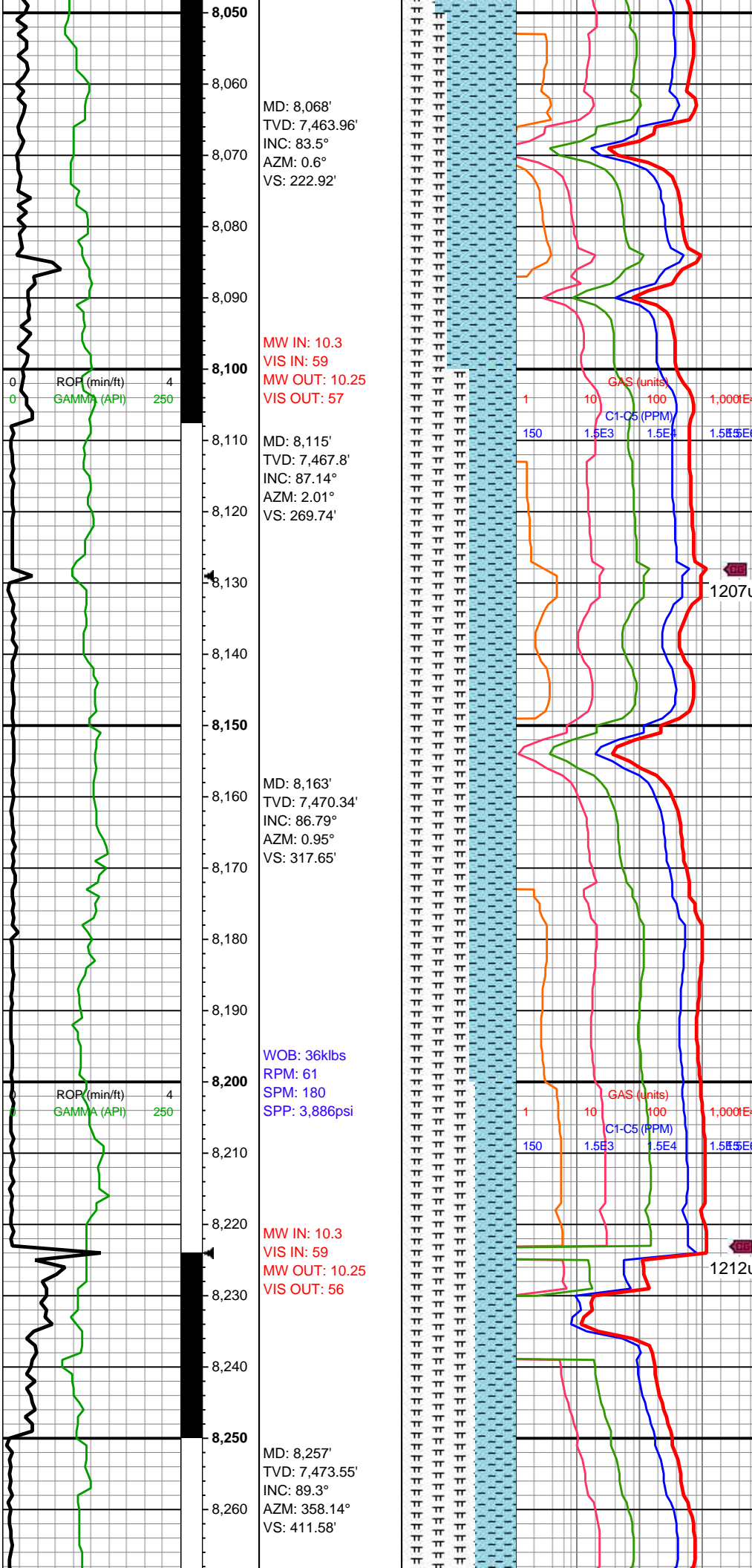
MD: 8,257'
TVD: 7,473.55'
INC: 89.3°
AZM: 358.14°
VS: 411.58'

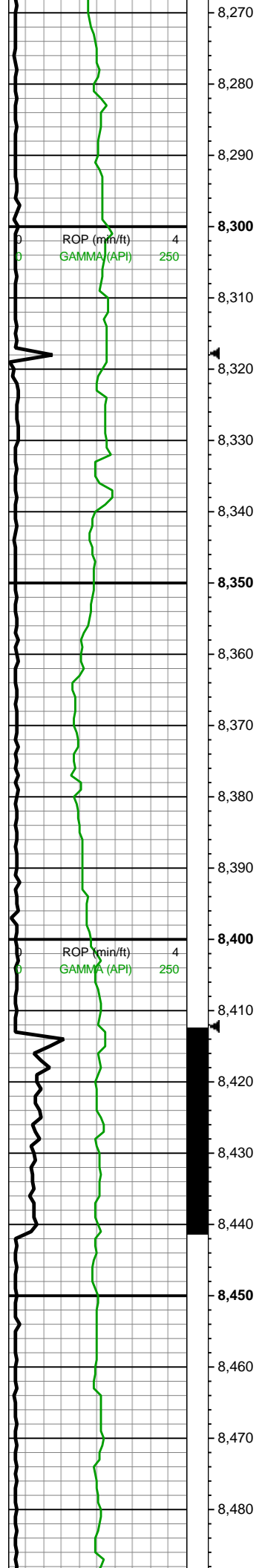
8050-8100 CHK (60%):
predy med brn-gyshbn,
stri, blk-y-sb tab, frm-sl sft,
tr free CHK, sme lam,
mnr dissm mic pyr;
MRLST (40%): predy dk
gy-dk gyshbn, frm-v frm,
tab-blky, mnr intbdd CHK,
sl sm tex, calc

Land Curve @ 8107' MD

8100-8200 60% MRLST:
dk gy-dk gyshbn ip, frm,
brit, mod fis, sb blk-y, sm
arg-sl slty tex, mod-freq
fos frags, mod forams, tr
vf pyr-c pyr strg ip, mod
calc wi brn mrlly resdl;
CHK (40%): med
gy-gyshbn mot wi f rd
chky incl & forams,
frm-brit, mod fis sb blk-y
ctngs, hi calc

8200-8300 MRLST
(65%): dk gy-dk gyshbn,
frm-brit, mod fis sb
blk-y-blky ctngs, sm arg-sl
slty tex, mod-freq fos





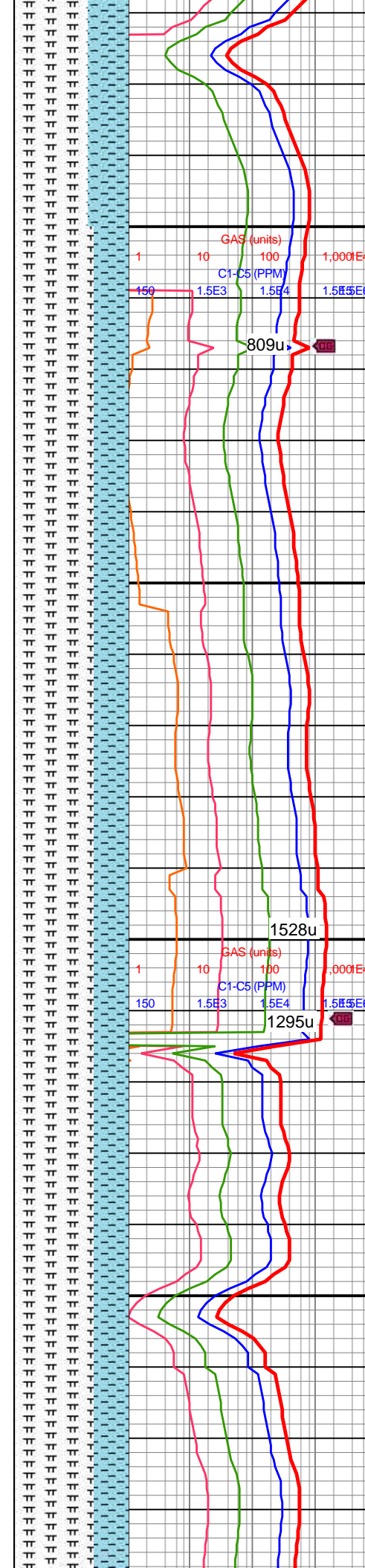
8,270
8,280
8,290
8,300
8,310
8,320
8,330
8,340
8,350
8,360
8,370
8,380
8,390
8,400
8,410
8,420
8,430
8,440
8,450
8,460
8,470
8,480

MD: 8,352'
TVD: 7,475'
INC: 88.95°
AZM: 358.14°
VS: 506.52'

WOB: 27klbs
RPM: 75
SPM: 180
SPP: 3,840psi

MW IN: 10.25
VIS IN: 54
MW OUT: 10.3
VIS OUT: 56

MD: 8,447'
TVD: 7,475.4'
INC: 90.57°
AZM: 3.06°
VS: 601.48'



frags, mod forams, tr bent, tr vf pyr-c pyr strg ip, mod calc wi brn mrly resdl; CHK (35%): med gy-gyshbn, frm-brit, mod fis sb blkly ctngs, com f-u f rd chky incl & forams, hi calc

GAS (units) 1 10 100 1,000E4
C1-C5 (PPM) 150 1.5E3 1.5E4 1.5E5E6

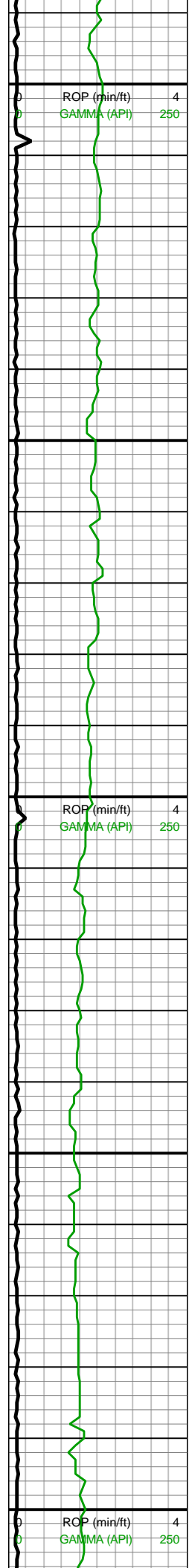
809u

8300-8400 MRLST (70%): dk gy-dk gyshbn, frm-brit, mot ip, mod fis sb blkly-blky ctngs, sm arg-sl slty tex, tr fos frags, tr vf pyr-c pyr strg ip, mod calc wi brn mrly resdl; CHK (30%): med gy-gyshbn, frm-brit, mod fis sb blkly ctngs, f-u f rd chky incl & forams, tr forams thru, hi calc

1528u
1295u

8400-8500 70% MRLST: dk gy, occ mot wi c brn mrly incl, frm, brit, mod fis, sb blkly, sm arg-sl slty tex, tr fos frags, tr vf pyr-c pyr strg ip, mod calc wi brn mrly resdl; CHK



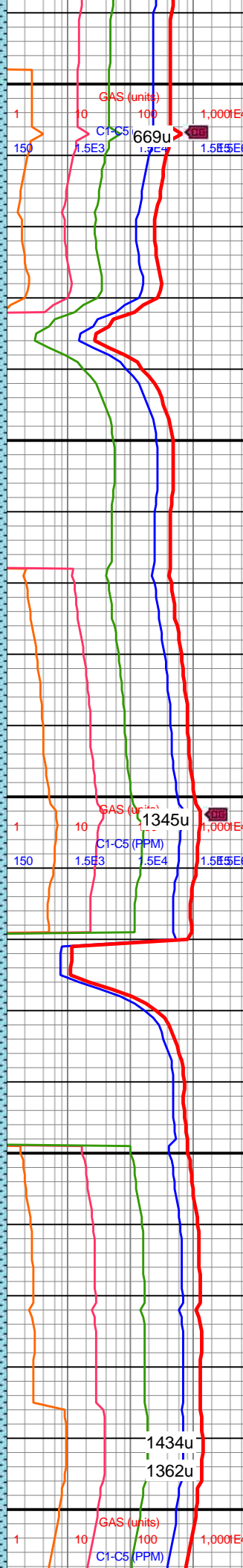
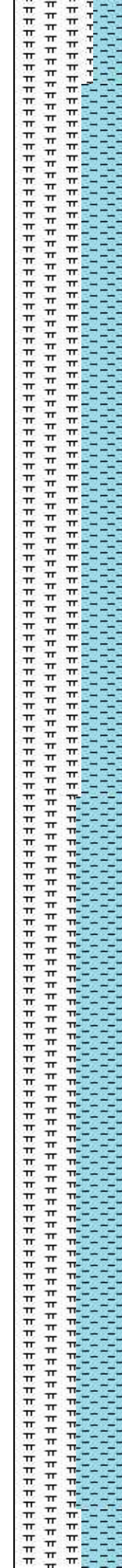


8,490
8,500
8,510
8,520
8,530
8,540
8,550
8,560
8,570
8,580
8,590
8,600
8,610
8,620
8,630
8,640
8,650
8,660
8,670
8,680
8,690
8,700

MD: 8,541'
TVD: 7,473.99'
INC: 91.14°
AZM: 2.89°
VS: 695.34'

WOB: 34klbs
RPM: 75
SPM: 180
SPP: 3,900psi

MD: 8,636'
TVD: 7,471.95'
INC: 91.32°
AZM: 359.81°
VS: 790.28'

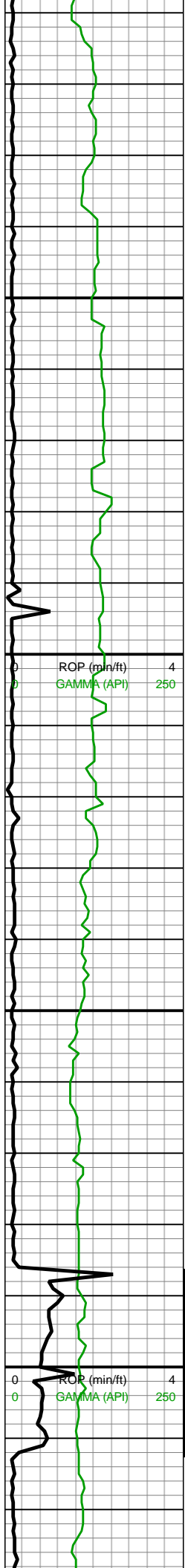


(30%): med gy-gyshbn
mot wi f rd chky incl &
forams, frm-brit, mod fis
sb blkly ctngs, hi calc

8500-8600 60% MRLST:
dk gy, occ mot wi c brn
mrly incl, frm, brit, mod
fis, sb blkly, sm arg-sl slty
tex, rr fos frags, tr vf pyr-c
pyr strg ip, mod calc wi
brn mrly resdl; CHK
(40%): med gy-gyshbn
mot wi f rd chky incl &
forams, frm-brit, mod fis
sb blkly ctngs, hi calc

8600-8700 MRLST
(55%): dk gy-dk gysbhn,
frm-brit, mot ip, mod fis
sb blkly-blky ctngs, sm
arg-sl slty tex, rr fos frags,
tr vf pyr-c pyr strg ip, mod
calc wi brn mrly resdl;
CHK (45%): med
gy-gyshbn, frm-brit, mod
fis sb blkly ctngs, f-u f rd
chky incl & forams, tr
forams thru, hi calc





MD: 8,731'
TVD: 7,469.26'
INC: 91.93°
AZM: 0.07°
VS: 885.24'

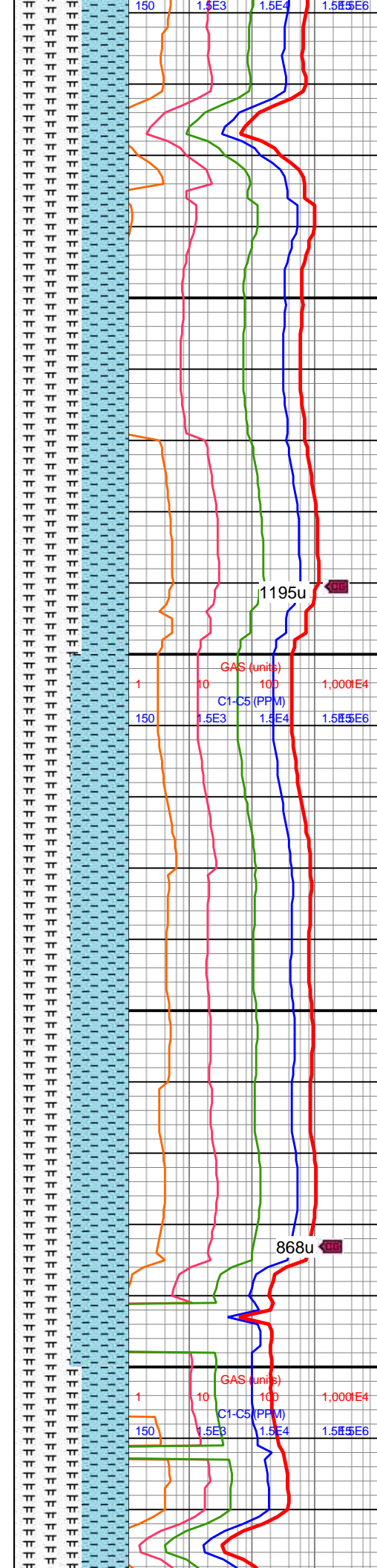
MW IN: 10.2
VIS IN: 57
MW OUT: 10.25
VIS OUT: 56

WOB: 33klbs
RPM: 75
SPM: 180
SPP: 3,980psi

MD: 8,823'
TVD: 7,465.91'
INC: 92.24°
AZM: 359.02°
VS: 977.17'

MW IN: 10.2
VIS IN: 56
MW OUT: 10.2
VIS OUT: 56

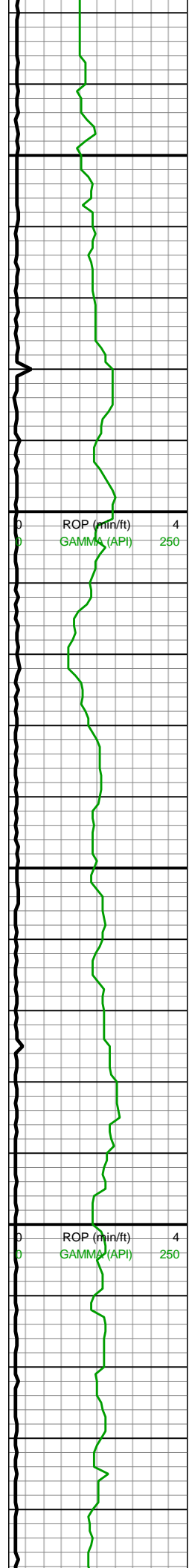
MD: 8,918'
TVD: 7,463'
INC: 91.27°
AZM: 1.04°
VS: 1,072.12'



8700-8800 60% MRLST:
dk gy-dk gyshbn ip, frm,
brit, mod fis, sb blk, sm
arg-sl slty tex, mod fos
frags, mod forams, tr vf
pyr-c pyr strg ip, mod calc
wi brn mrly resdl; CHK
(40%): med gy-gyshbn
mot wi f rd chky incl &
forams, frm-brit, mod fis
sb blk ctngs, hi calc

8800-8900 MRLST
(50%): dk gy-dk gyshbn,
frm-brit, mod fis sb
blk-blky ctngs, sm arg-sl
slty tex, mod-freq fos
frags, mod forams, tr
bent, tr vf pyr-c pyr strg ip,
mod calc wi brn mrly
resdl; CHK (50%): med
gy-gyshbn, frm-brit, mod
fis sb blk ctngs, com f-u
f rd chky incl & forams, hi
calc



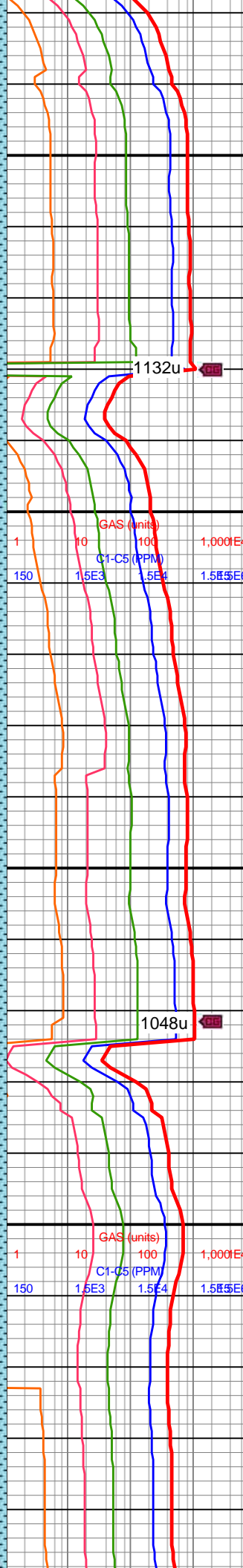
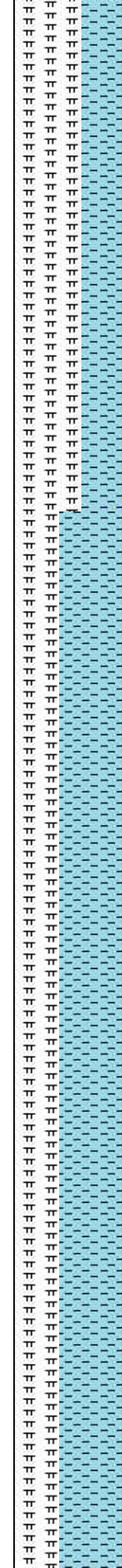


8,930
8,940
8,950
8,960
8,970
8,980
8,990
9,000
9,010
9,020
9,030
9,040
9,050
9,060
9,070
9,080
9,090
9,100
9,110
9,120
9,130
9,140

MD: 9,012'
TVD: 7,461.13'
INC: 91.01°
AZM: 359.63°
VS: 1,166.1'

MD: 9,107'
TVD: 7,459.53'
INC: 90.92°
AZM: 0.07°
VS: 1,261.08'

MW IN: 10.2
VIS IN: 55
MW OUT: 10.2
VIS OUT: 56



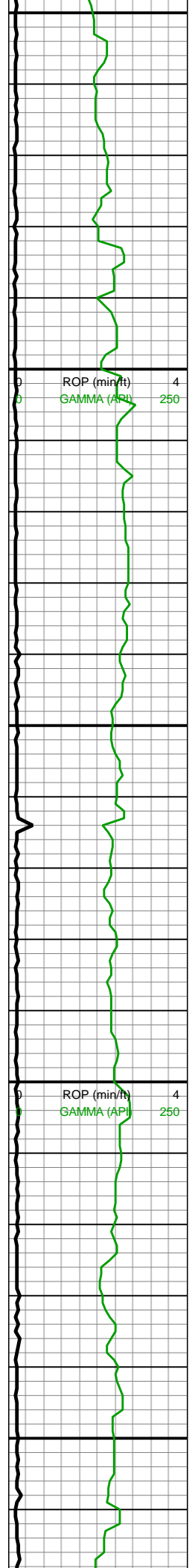
8900-9000 MRLST
(60%): dk gy mot wi dk
gyshbn mrl ptch incl ip,
frm, brit, mod fis sb
blky-blky ctngs, sm arg-sl
silty tex, tr vf pyr-c pyr strg
ip, mod calc wi brn mrly
resdl; CHK (40%): med
gy-gyshb, rr lt gy, frm-brit,
mod fis sb blky ctngs,
rr-occ forams, tr fos
frags, tr vf pyr, hi calc

9000-9100 CHK (60%):
med gy-gyshbn, frm-brit,
mod fis sb blky ctngs,
com f-u f rd chky incl &
forams, hi calc; MRLST
(40%): dk gy-dk gyshbn,
frm-brit, mod fis sb
blky-blky ctngs, sm arg-sl
silty tex, mod-freq fos
frags, mod forams, tr
bent, tr vf pyr-c pyr strg ip,
mod calc wi brn mrly
resdl



1132u

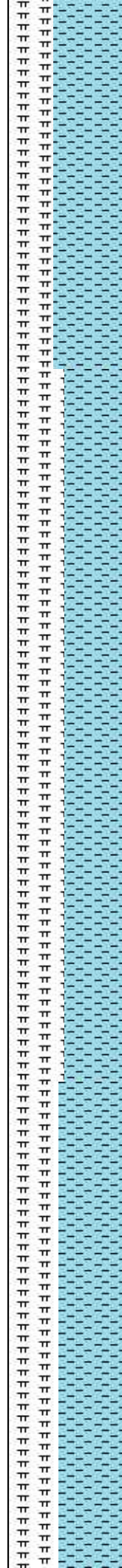
1048u



9,150
9,160
9,170
9,180
9,190
9,200
9,210
9,220
9,230
9,240
9,250
9,260
9,270
9,280
9,290
9,300
9,310
9,320
9,330
9,340
9,350
9,360

WOB: 29klbs
RPM: 76
SPM: 180
SPP: 3,970psi
MD: 9,202'
TVD: 7,458.4'
INC: 90.44°
AZM: 0.07°
VS: 1,356.08'

MD: 9,296'
TVD: 7,457.72'
INC: 90.4°
AZM: 358.23°
VS: 1,450.06'

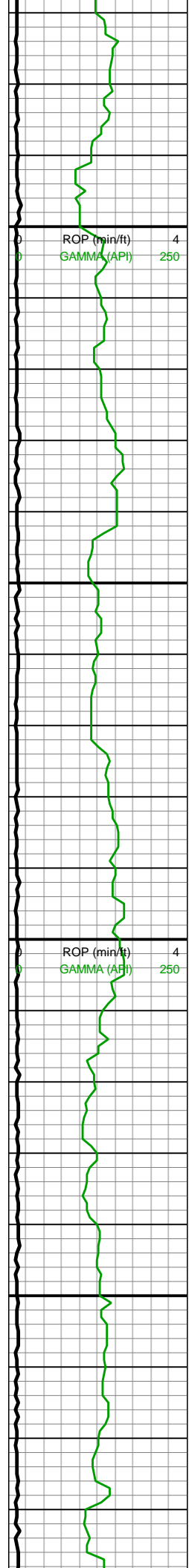


9100-9200 CHK (60%):
med gy-gyshbn, frm-brit,
mod fis sb blkly ctngs,
occ f chky incl, rr forams,
hi calc; MRLST (40%): dk
gy-dk gyshbn, frm-brit,
mod fis sb blkly-blky
ctngs, sm arg-sl slty tex,
tr vf pyr-c pyr strg ip, mod
calc wi brn mrly resdl

9200-9300 CHK (50%):
med gy-gyshbn, rr lt gy wi
com thn chky lamn & incl,
frm-brit, l-mod fis sb
rd-sb blkly-blky ctngs, tr
forams, tr bent, hi calc;
MRLST (50%): dk gy-dk
gyshbn, frm-brit, mod fis
sb blkly-blky ctngs, sm
arg-sl slty tex, tr vf pyr-c
pyr strg ip, mod calc wi
brn mrly resdl

9300-9400 MRLST
(55%): dk gy mot wi dk
gyshbn mrl ptch incl ip,





9,370
9,380
9,390
9,400
9,410
9,420
9,430
9,440
9,450
9,460
9,470
9,480
9,490
9,500
9,510
9,520
9,530
9,540
9,550
9,560
9,570
9,580

MW IN: 10.25
VIS IN: 54
MW OUT: 10.3
VIS OUT: 55

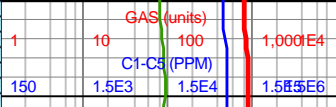
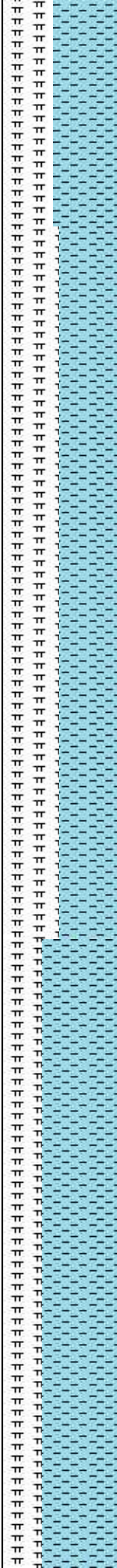
MD: 9,391'
TVD: 7,457.05'
INC: 90.4°
AZM: 359.72°
VS: 1,545.04'

WOB: 33klbs
RPM: 75
SPM: 180
SPP: 4,020psi

MD: 9,485'
TVD: 7,456.44'
INC: 90.35°
AZM: 359.63°
VS: 1,639.04'

MW IN: 10.25
VIS IN: 55
MW OUT: 10.25
VIS OUT: 54

MD: 9,580'
TVD: 7,455.89'
INC: 90.31°
AZM: 359.02°
VS: 1,734.03'



1427u

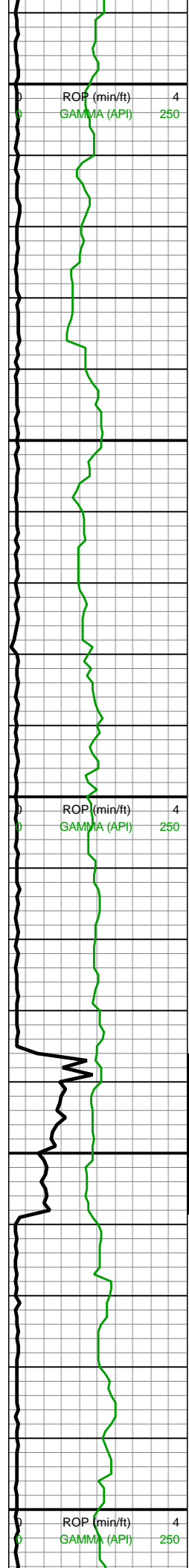
1199u

frm, brit, mod fis sb
blky-blky ctngs, sm arg-sl
silty tex, tr vf pyr-c pyr strg
ip, tr bent, mod calc wi
brn mrly resdl; CHK
(45%): med gy-gyshbrn,
rr lt gy, frm-brit, mod fis
sb blky ctngs, rr forams,
tr fos frags, tr vf pyr, hi
calc

9400-9500 CHK (60%):
med gy-gyshbn, frm-brit,
mod fis sb blky ctngs,
occ f chky incl, rr-occ
forams & fos frags, hi
calc; MRLST (40%): dk
gy-dk gyshbn, frm-brit,
mod fis sb blky-blky
ctngs, sm arg-sl slty tex,
tr vf pyr-c pyr strg ip, mod
calc wi brn mrly resdl

9500-9600 CHK (65%):
med gy-gyshbn, frm-brit,
mod fis sb blky ctngs,
occ f chky incl, rr-occ fos
frags, rr-occ forams, hi
calc; MRLST (35%): dk
gy-dk gyshbn, frm-brit,





WOB: 34klbs
RPM: 75
SPM: 180
SPP: 4,020psi

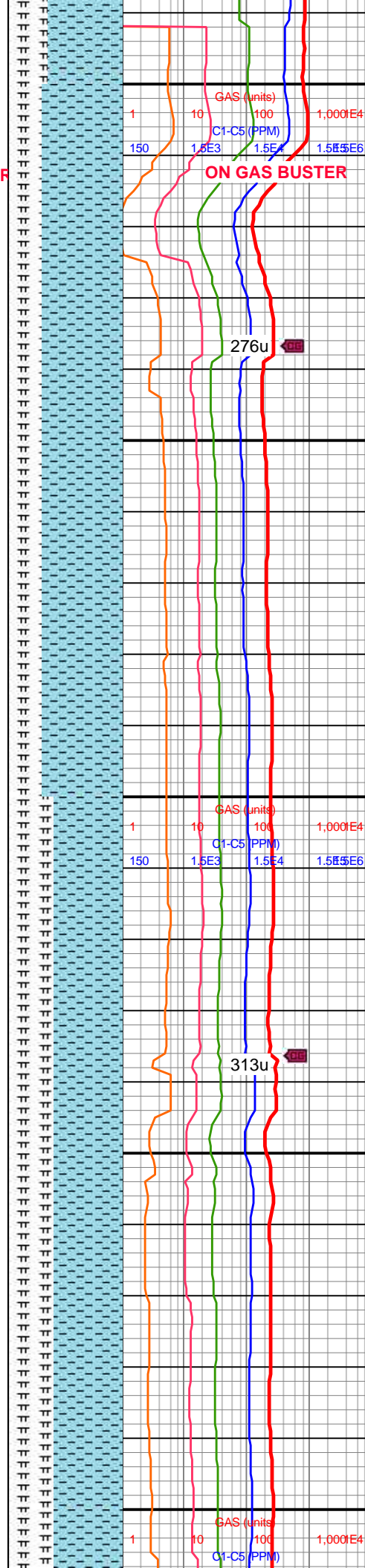
ON GAS BUSTER

MD: 9,674'
TVD: 7,455.42'
INC: 90.26°
AZM: 357.96°
VS: 1,828'

MW IN: 10.2
VIS IN: 54
MW OUT: 10.25
VIS OUT: 56

MD: 9,769'
TVD: 7,454.48'
INC: 90.88°
AZM: 1.22°
VS: 1,922.98'

WOB: 29klbs
RPM: 75
SPM: 179
SPP: 3,970psi



GAS (units)
1 10 100 1,000E4
C1-C5 (PPM)
150 1.5E3 1.5E4 1.5E6

276u

313u

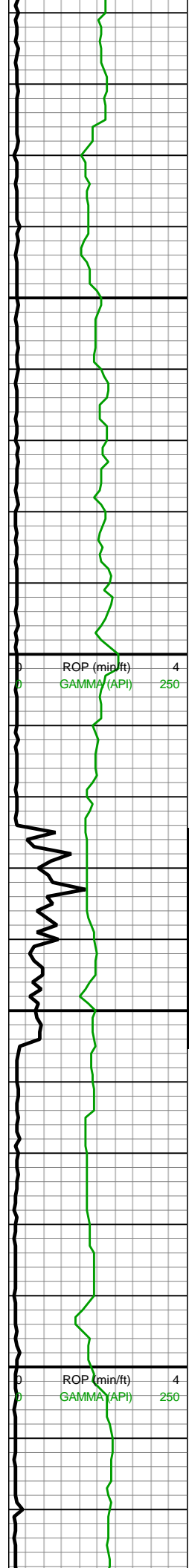
GAS (units)
1 10 100 1,000E4
C1-C5 (PPM)

mod fis sb blkly-blky
ctngs, sm arg-sl slty tex,
tr vf pyr-c pyr strg ip, mod
calc wi brn mrly resdl

9600-9700 CHK (70%):
med gy-gyshbn, frm-brit,
mod fis sb blkly ctngs,
occ f chky incl, rr-occ
forams & fos frags, hi
calc; MRLST (30%): dk
gy-dk gyshbn, frm-brit,
mod fis sb blkly-blky
ctngs, sm arg-sl slty tex,
tr vf pyr-c pyr strg ip, mod
calc wi brn mrly resdl

9700-9800 CHK (70%):
med gy-gyshbn wi rr-occ
f-u f rd forams, frm-brit,
mod fis sb blkly-blky
ctngs, tr fos frags, hi
calc; MRLST (40%): dk
gy-dk gyshbn, frm-brit,
mod fis sb blkly-blky
ctngs, sm arg-sl slty tex,
tr vf pyr, mod calc wi brn
mrly resdl





9,810
9,820
9,830
9,840
9,850
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

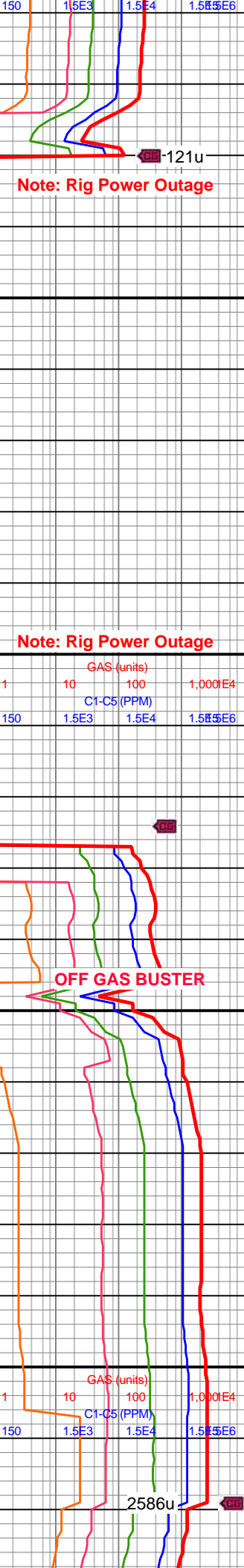
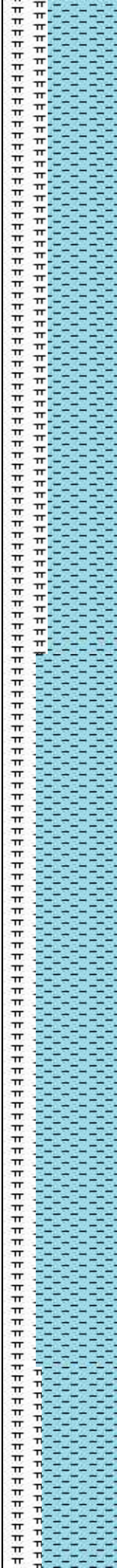
MD: 9,864'
TVD: 7,452.33'
INC: 91.71°
AZM: 359.9°
VS: 2,017.95'

MW IN: 10.25
VIS IN: 53
MW OUT: 10.2
VIS OUT: 51

OFF GAS BUSTER

MD: 9,959'
TVD: 7,450.88'
INC: 90.04°
AZM: 359.37°
VS: 2,112.93'

WOB: 34kbs
RPM: 75
SPM: 178
SPP: 3,920psi



Note: Rig Power Outage

Note: Rig Power Outage

OFF GAS BUSTER

Note: Rig Power Outage

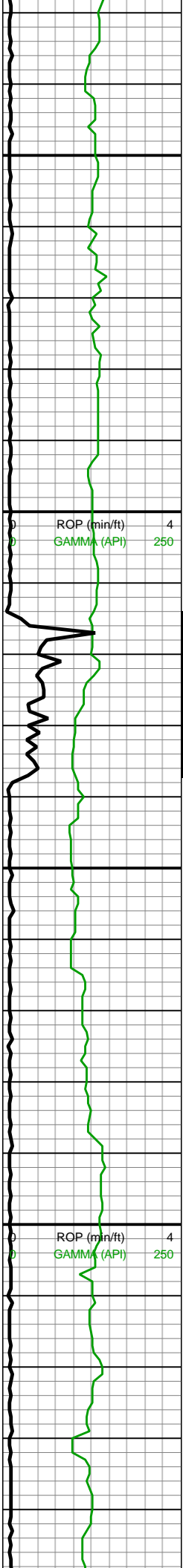
9800-9900 CHK (60%):
med gy-gyshbn, frm-brit,
mod fis sb blkly ctngs,
occ f chky incl, rr-occ
forams, tr fos frags, hi
calc; MRLST (40%): dk
gy-dk gyshbn, frm-brit,
mod fis sb blkly-blky
ctngs, sm arg-sl slty tex,
tr vf pyr, mod calc wi brn
mrly resdl

9900-10000 CHK (70%):
med gy-gyshbn, rr lt gy,
frm-brit, mod fis sb
blkly-blky ctngs, rr-occ
forams, rr fos frags, hi
calc; MRLST (40%): dk
gy-dk gyshbn, frm-brit,
mod fis sb blkly-blky
ctngs, sm arg-sl slty tex,
tr vf pyr, mod calc wi brn
mrly resdl



121u

2586u



10,030
10,040
10,050
10,060
10,070
10,080
10,090
10,100
10,110
10,120
10,130
10,140
10,150
10,160
10,170
10,180
10,190
10,200
10,210
10,220
10,230
10,240

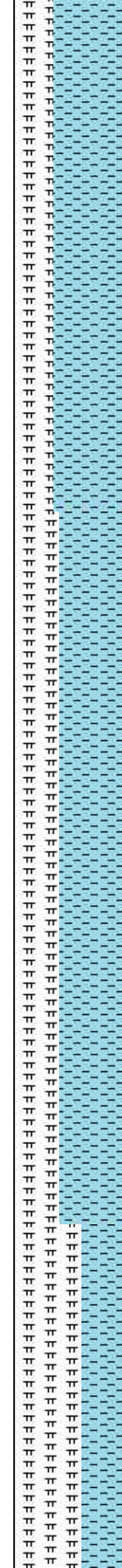
MD: 10,054'
TVD: 7,450.37'
INC: 90.57°
AZM: 0.07°
VS: 2,207.93'

MD: 10,149'
TVD: 7,451.43'
INC: 88.15°
AZM: 0.16°
VS: 2,302.92'

WOB: 35klbs
RPM: 75
SPM: 178
SPP: 4,090psi

MW IN: 10.25
VIS IN: 53
MW OUT: 10.25
VIS OUT: 51

MD: 10,243'
TVD: 7,454.17'
INC: 88.51°
AZM: 359.99°
VS: 2,322.28'



10000-10100 CHK
(65%): med gy-gyshbn wi
rr-occ f-u f rd forams,
frm-brit, mod fis sb
blky-blky ctngs, rr fos
frags, hi calc; MRLST
(35%): dk gy-dk gyshbn,
frm-brit, mod fis sb
blky-blky ctngs, sm-sl slty
tex, tr vf pyr, mod calc wi
brn mrly resdl

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



GAS (units)
1 10 100 1,000E4
C1-Q5 (PPM)
150 1.5E3 696u 1.5E5E6
871u

GAS (units)
1 10 100 1,000E4
C1-Q5 (PPM)
150 1.5E3 1.5E4 1.5E6
856u

VS: 2,396.88'

ROP (min/ft) 4
GAMMA (API) 250

MD: 10,337'
TVD: 7,456.04'
INC: 89.21°
AZM: 0.07°
VS: 2,490.86'

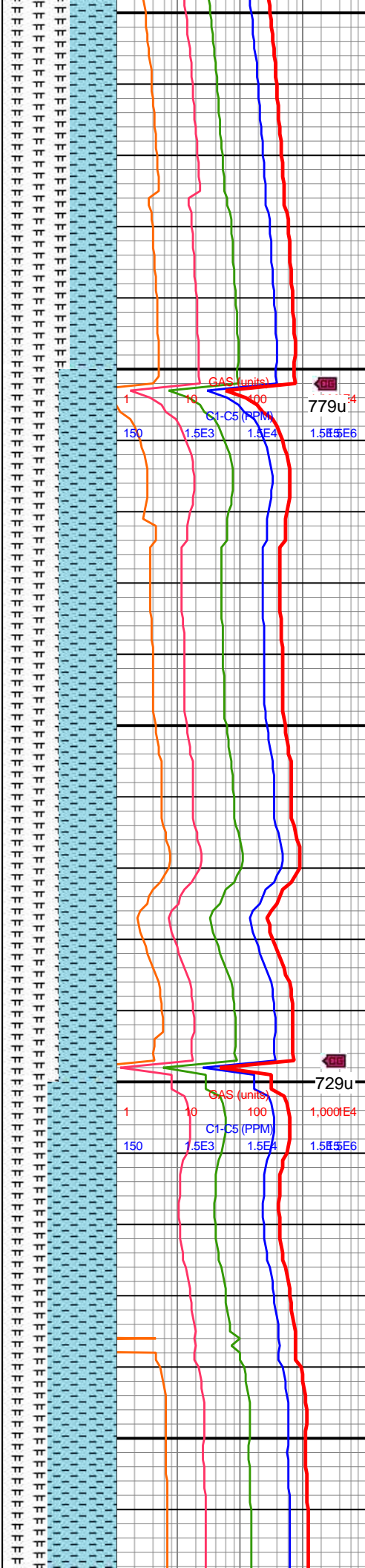
MW IN: 10.2+
VIS IN: 53
MW OUT: 10.2+
VIS OUT: 52

WOB: 29.4klbs
RPM: 75
SPM: 180
SPP: 3,998psi

MD: 10,432'
TVD: 7,456.99'
INC: 89.65°
AZM: 358.58°
VS: 2,585.84'

10,450

10,460

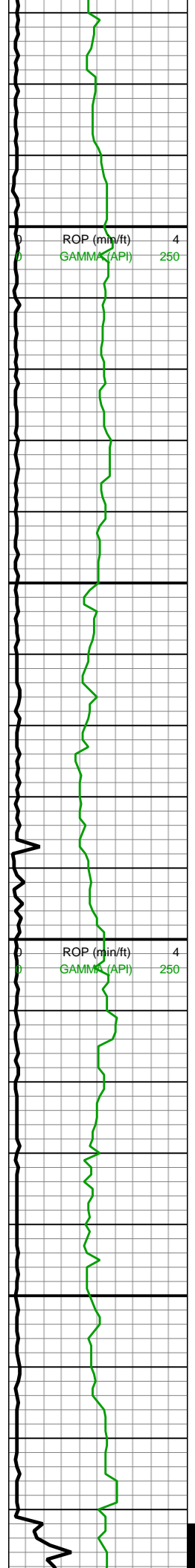


10200-10300 MRLST
(60%): dk gy-dk gyshbn,
sb tab-sb spl't ctngs,
frm-sl hrd, mnr lam CHK,
tr imbd/pp pyr, v calc;
CHK (40%): med brn-dk
gyshbn, mot, blk-y-sb spl't,
chky tex, frm-sl sft, tr cal
frac fl, tr mic pyr, v calc

10300-10400 CHK
(50%): med gy-gyshbn,
sb blk-y-blky ctngs,
frm-brit, mod fis, sl
slyt-chky tex, tr mic pyr
strg, tr free CHK, hi calc;
MRLST (50%): dk gy-v dk
gy, frm-brit, mod fis sb
blk-y-blky ctngs, sm-sl slyt
tex, tr intbdd CHK, mnr
mic pyr, mod calc

10400-10500 CHK
(60%): med brn-gyshbn,



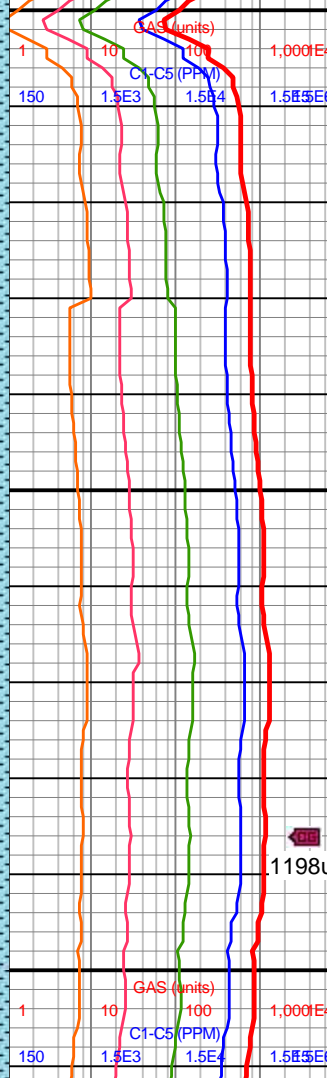
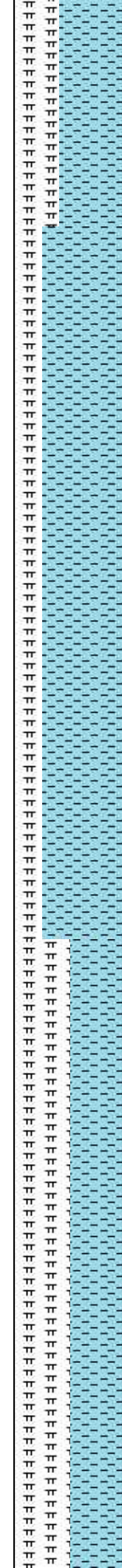


10,470
10,480
10,490
10,500
10,510
10,520
10,530
10,540
10,550
10,560
10,570
10,580
10,590
10,600
10,610
10,620
10,630
10,640
10,650
10,660
10,670
10,680

MD: 10,526'
TVD: 7,456.81'
INC: 90.57°
AZM: 359.46°
VS: 2,679.83'

WOB: 35.7kbs
RPM: 72
SPM: 184
SPP: 4,245psi

MD: 10,621'
TVD: 7,455.32'
INC: 91.23°
AZM: 357.88°
VS: 2,774.79'



mot-sl stri, sb blkly-blky
ctngs, frm-brit, sl
slyt-chky tex, mod fis, tr
pp mic pyr strg, tr CHK
intbds, hi calc; MRLST
(40%): dk gy-v dk gy,
frm-brit, sb blkly-blky
ctngs, mod fis, sm-sl slyt
tex, mnr mic pyr, mod-hi
calc

10500-10600 CHK
(75%): med brn-gyshbn,
sb blkly-blky ctngs, sb
frm-frm-brit, mod fis, sl
sm-chky tex, tr imbd mic
pyr, hi calc; MRLST
(25%): dk gy-v dk gyshbn,
mod fis, frm-brit, sm-sl
slyt tex, sb blkly-blky
ctngs, tr mic pyr, mod
calc

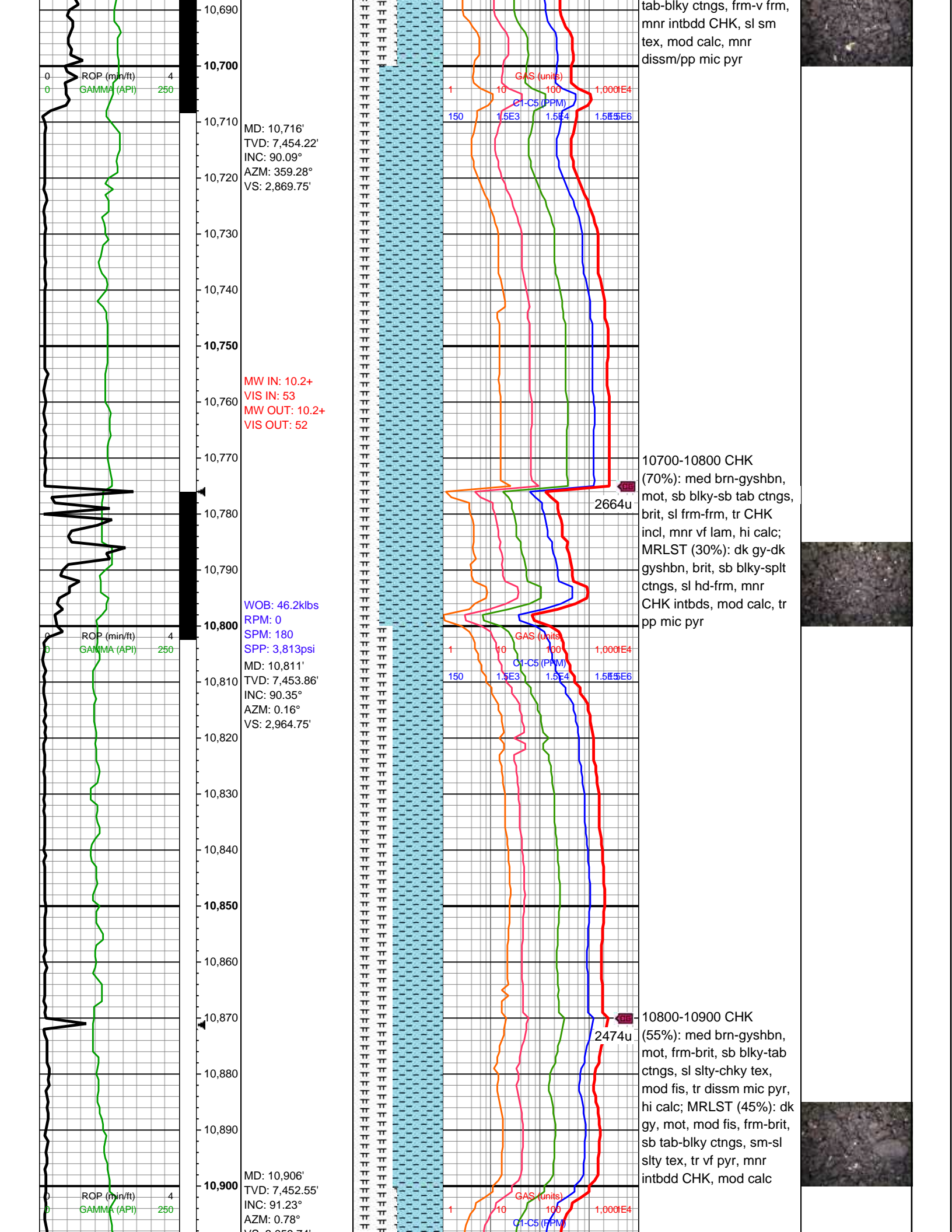
10600-10700 CHK
(50%): predy med
brn-gyshbn, mot-stri,
frm-sl sft, blkly-sb tab, tr
free CHK, sme lam, hi
calc; MRLST (50%):
predy dk gy-dk gyshbn,

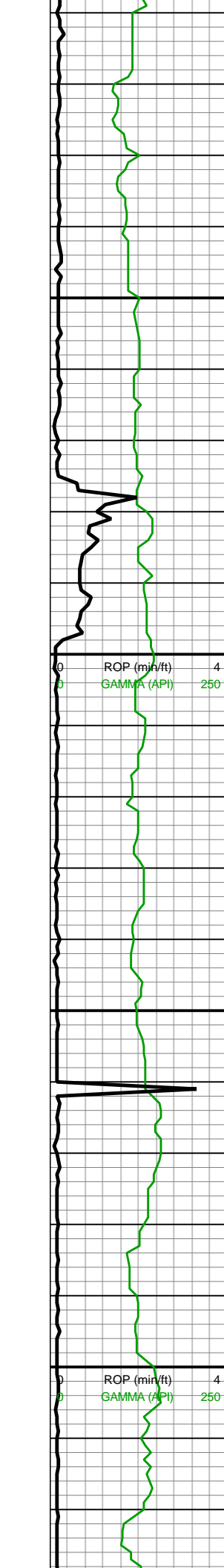


1076u

1198u

1781u





VS: 3,059.74

ON GAS BUSTER

MW IN: 10.2
VIS IN: 53
MW OUT: 10.2+
VIS OUT: 53

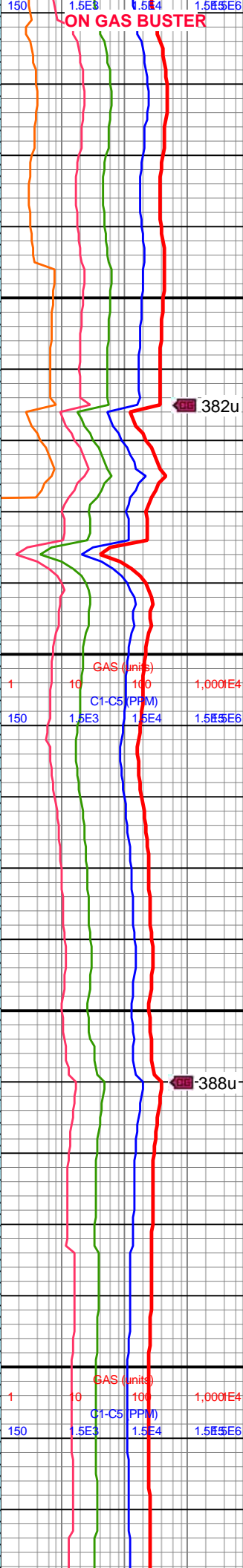
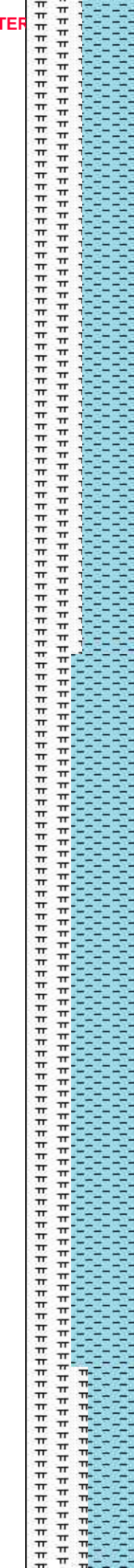
WOB: 40.7klbs
RPM: 75
SPM: 186
SPP: 4,408psi

MD: 11,000'
TVD: 7,451.51'
INC: 90.04°
AZM: 1.3°
VS: 3,153.71'

ROP (min/ft) 4
GAMMA (API) 250

ROP (min/ft) 4
GAMMA (API) 250

MD: 11,095'
TVD: 7,450.24'
INC: 91.49°
AZM: 359.55°
VS: 3,248.69'



ON GAS BUSTER

10900-11000 CHK
(50%): med brn-gyshbn, frm-brit, sb blkly-blky ctngs, mod fis, sm-chky tex, tr pp mic pyr, hi calc; MRLST (50%): dk gy-dk gyshbn, mot dk brn, frm-brit, ang-sb blkly, mod fis ctngs, sm tex, sl slty ip, mod calc, tr imbd mic pyr

382u

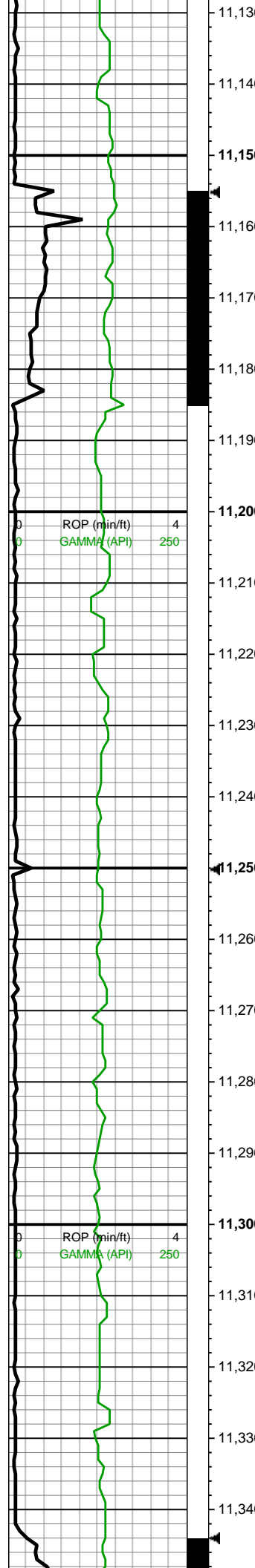
GAS (units) 1,000E4
C1-C5 (PPM) 1.5E3 1.5E4 1.5E5E6

11000-11100 CHK
(60%): gyshbn-med brn, mot-stri, blkly-sb tab, frm-sl sft, sme lam, tr free CHK, hi calc; MRLST (40%): predy dk gy-dk gyshbn, sl sm tex, frm-v frm, tab-blky, mnr intbdd CHK, mod-hi calc, tr pp mic pyr

388u

GAS (units) 1,000E4
C1-C5 (PPM) 1.5E3 1.5E4 1.5E5E6





11,130
11,140
11,150
11,160
11,170
11,180
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11,200
11,210
11,220
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11,260
11,270
11,280
11,290
11,300
11,310
11,320
11,330
11,340

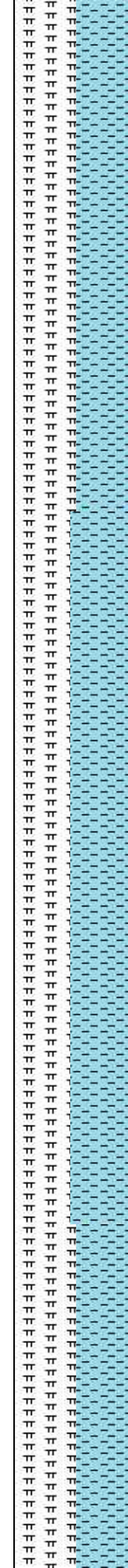
MD: 11,189'
TVD: 7,449.59'
INC: 89.3°
AZM: 1.83°
VS: 3,342.67'
WOB: 32.2klbs
RPM: 75
SPM: 188
SPP: 4,502psi

MW IN: 10.2
VIS IN: 53
MW OUT: 10.2+
VIS OUT: 53

MD: 11,284'
TVD: 7,450.35'
INC: 89.78°
AZM: 2.71°
VS: 3,437.59'

ROP (min/ft) 4
GAMMA (API) 250

ROP (min/ft) 4
GAMMA (API) 250



GAS (units) 1,000E4
C1-C5 (PPM) 1.5E3 1.5E4 1.5E5E6

GAS (units) 1,000E4
C1-C5 (PPM) 1.5E3 1.5E4 1.5E5E6

11100-11200 MRLST (55%): predy dk gy-dk gyshbn, frm-v frm, tab-blky, sl sm tex, mnr intbdd CHK, mod-hi calc; CHK (45%): gyshbn, mot med brn, blky-sb tab, stri, frm-sl sft, tr free CHK, sme lam, v calc

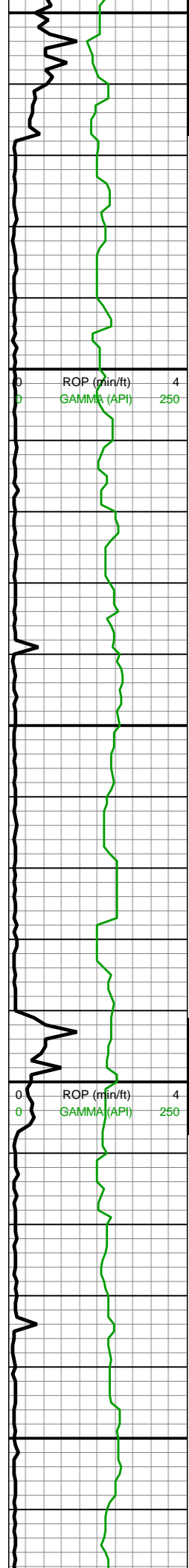
11200-11300 CHK (50%): med brn-dk gyshbn, frm-brit, sb blky ctngs, tr free CHK, mod fis, hi calc; MRLST (50%): dk gy-dk gyshbn, frm-brit, sb blky-tab ctngs, mod fis, sm arg-sl slty tex, tr vf pyr, tr CHK intbds/incl, mod calc

418u

345u

452u





11,350
11,360
11,370
11,380
11,390
11,400
11,410
11,420
11,430
11,440
11,450
11,460
11,470
11,480
11,490
11,500
11,510
11,520
11,530
11,540
11,550
11,560

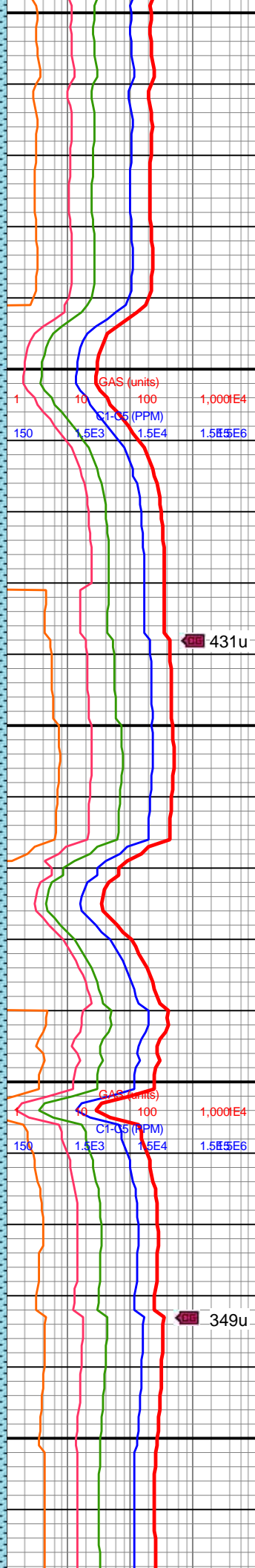
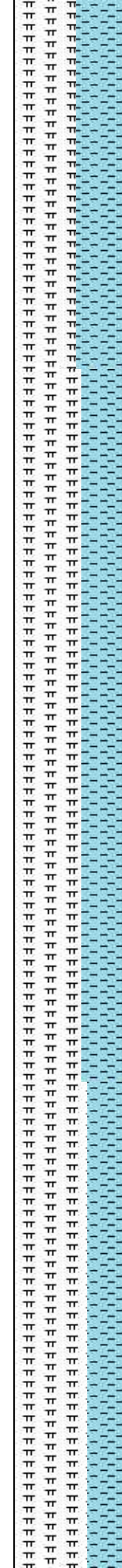
MD: 11,378'
TVD: 7,453.38'
INC: 86.53°
AZM: 1.04°
VS: 3,531.47'

WOB: 36.7klbs
RPM: 74
SPM: 184
SPP: 4,540psi

MD: 11,473'
TVD: 7,459.53'
INC: 86.05°
AZM: 359.9°
VS: 3,626.26'

MW IN: 10.2+
VIS IN: 53
MW OUT: 10.2+
VIS OUT: 53

MD: 11,568'
TVD: 7,464.62'
INC: 87.9°



11300-11400 MRLST (55%): dk gy-med gy, frm-sl hrd, blk-sb tab, tr imbd/pp mic pyr, tr CHK incl, v calc; CHK (45%): med brn-gyshbn, mot, blk-sb spl, chky tex, frm-sl sft, tr imbd/pp mic pyr, v calc

11400-11500 MRLST (60%): dk gy, mot med gy, sb blk-tab ctngs, frm, sm-sl slty tex, tr mic pyr, CHK lamn/incl, mod calc; CHK (40%): gyshbn-med brn, stri, sl sm-chky tex, sb tab-sb blk ctngs, sl frm-frm, mnr free CHK, tr mic pyr, hi calc



431u

349u

INC: 87.8°
AZM: 2.18°
VS: 3,721.1'

WOB: 36.1kbs
RPM: 76
SPM: 186
SPP: 4,569psi

MD: 11,662'
TVD: 7,468.37'
INC: 87.63°
AZM: 2.01°
VS: 3,814.96'

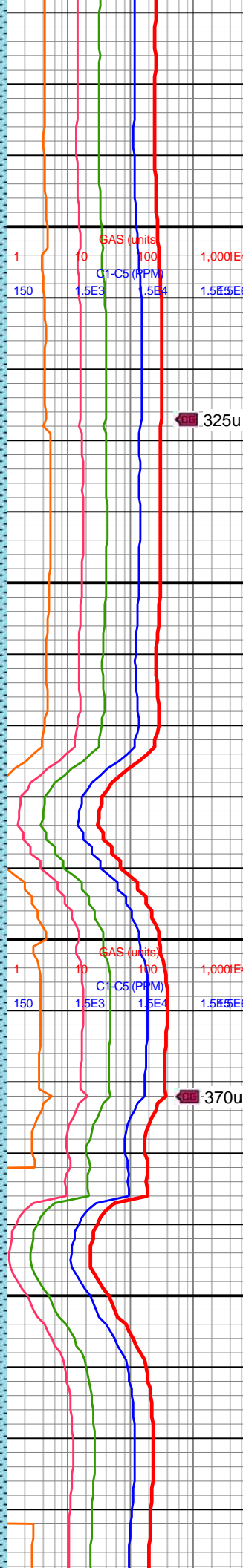
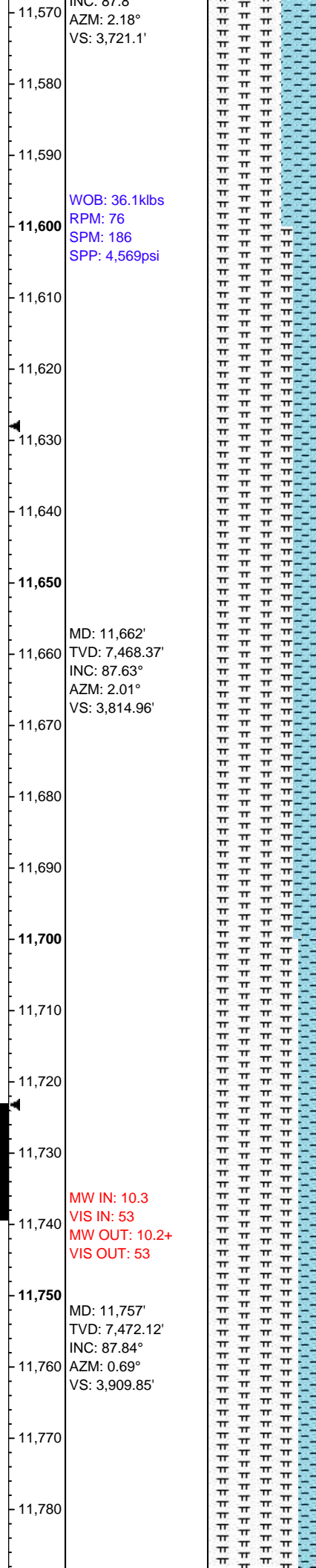
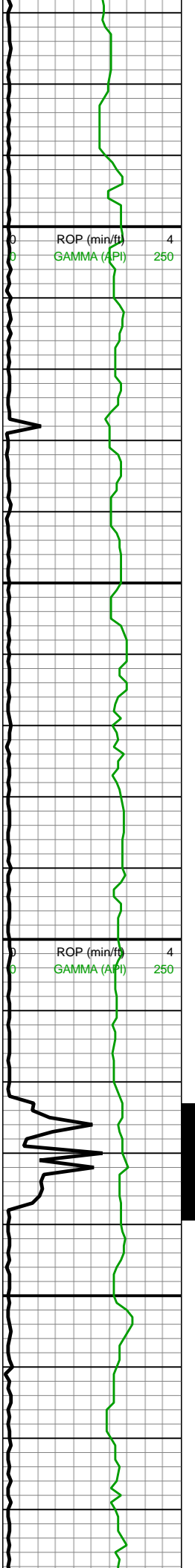
MW IN: 10.3
VIS IN: 53
MW OUT: 10.2+
VIS OUT: 53

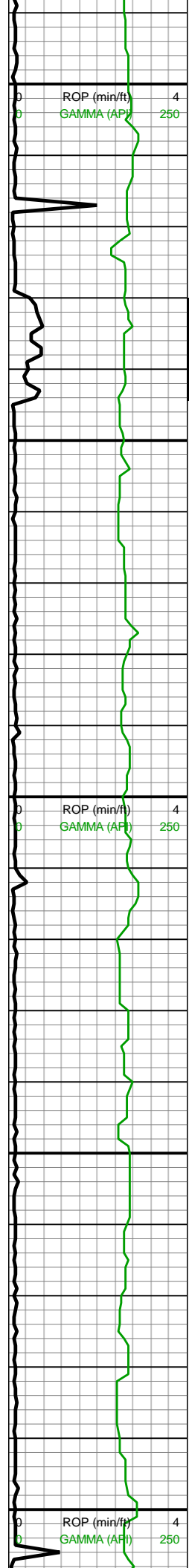
MD: 11,757'
TVD: 7,472.12'
INC: 87.84°
AZM: 0.69°
VS: 3,909.85'

11500-11600 MRLST
(65%): dk gy-med gy, sb
blky-tab ctngs, sl hd frm,
sm-sl slty tex, intbdd
CHK, tr mic pyr, mod
calc; CHK (35%): gyshbn,
med brn, stri, sl frm, sb
blky-sb tab ctngs, tr pp
mic pyr, sm-chky tex, tr
free CHK, hi calc

11600-11700 MRLST
(75%): predy dk gy-dk
gyshbn, frm-sl hrd,
blky-sb tab, tr lam CHK, tr
imbd/pp pyr, v calc; CHK
(25%): med brn-dk
gyshbn, mot, frm-sl sft,
blky-sb spl, tr cal frac fl,
chky tex, tr imbd mic pyr, v
calc

11700-11800 MRLST
(80%): dk gy-dk gyshbn,
dk brn, sb tab-sb spl,
frm-sl hd, sm arg tex,
mnr intbdd CHK, tr pp
mic pyr, mod-hi calc;
CHK (20%): gyshbn-med





11,790
11,800
11,810
11,820
11,830
11,840
11,850
11,860
11,870
11,880
11,890
11,900
11,910
11,920
11,930
11,940
11,950
11,960
11,970
11,980
11,990
12,000

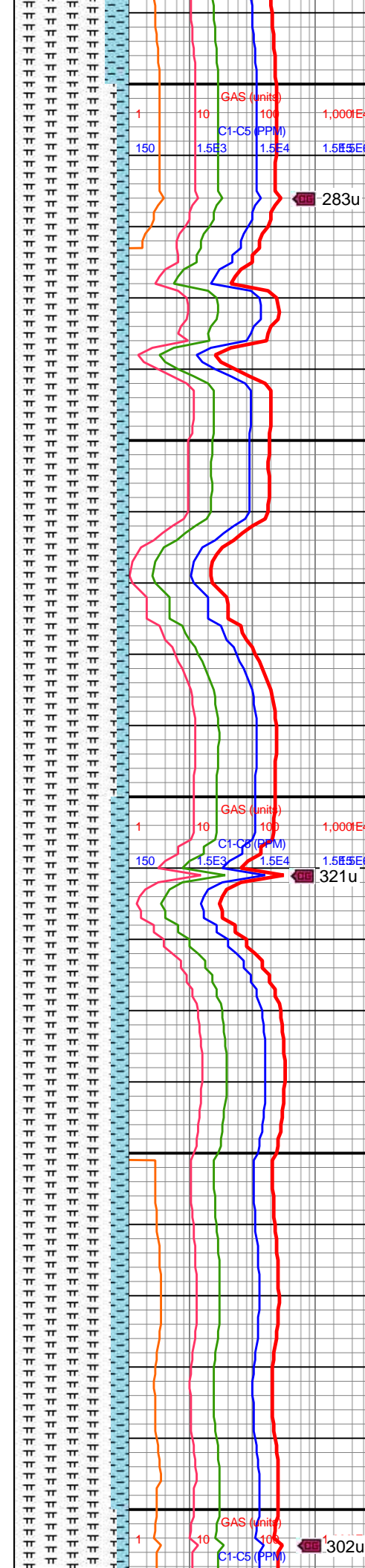
WOB: 36.7klbs
RPM: 75
SPM: 189
SPP: 4,670psi

MD: 11,852'
TVD: 7,474.13'
INC: 89.74°
AZM: 2.01°
VS: 4,004.8'

MD: 11,946'
TVD: 7,474.78'
INC: 89.47°
AZM: 0.95°
VS: 4,098.76'

MW IN: 10.3
VIS IN: 53
MW OUT: 10.2+
VIS OUT: 53

WOB: 37.1klbs
RPM: 76
SPM: 185
SPP: 4,621psi



brn, med gy, mot, frm,
sm-chky tex, blk-sb tab
ctngs, tr imbd mic pyr, hi
calc

11800-11900 MRLST
(90%): dk gy-dk gyshbn,
sb blk-splt ctngs, sl hd,
tr CHK intbds, brit, tr
dissm mic pyr, mod calc;
CHK (10%): gyshbn-med
brn, sb blk-sb tab ctngs,
chky tex, sl frm-brit, tr vf
lam, hi calc

11900-12000 MRLST
(85%): dk gy-v dk gy,
frm-brit, sm-sl slty tex,
mod fis, blk-sb spl
ctngs, tr pp mic pyr,
mod-hi calc; CHK (15%):
med brn-dk gyshbn, mot,
frm-brit, thn lamn ip, sl
sm-chky tex, tr imbd mic
pyr, hi calc



283u

321u

302u



12,010
12,020
12,030
12,040
12,050
12,060
12,070
12,080
12,090
12,100
12,110
12,120
12,130
12,140

MD: 12,032'
TVD: 7,475.74'
INC: 89.25°
AZM: 0.42°
VS: 4,184.74'

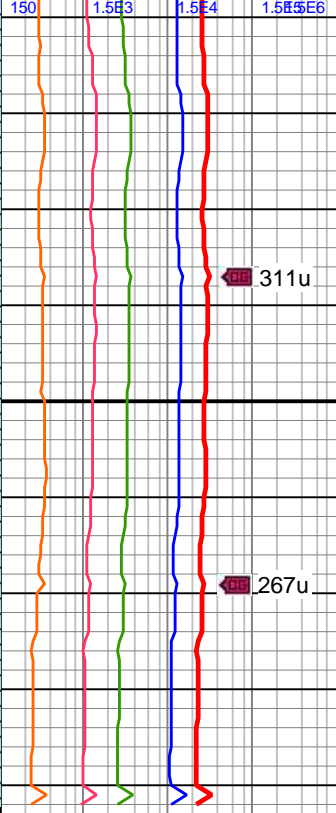
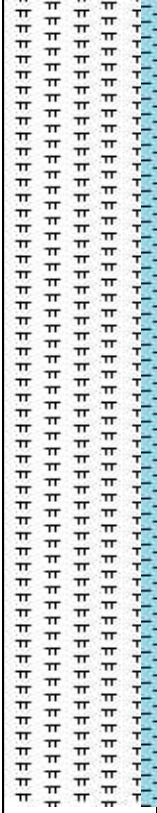
**TD of 12,092'
reached @
03:00 hrs on
8/30/17**

Projection to Bit

MD: 12,092'
TVD: 7,476.53'
INC: 89.25°
AZM: 0.42°
VS: 4,244.74'

Bit #: 1
Type: U516S
Size: 8 1/2
Depth In: 1,720'
Depth Out:
12,092'
Hours: 39.5 hrs
Avg Ft/Hr: 263 1/2
Jets: 5x14
S/N: C2-171178

0	ROP (min/ft)	4
0	GAMMA (API)	250



GAS (units)			
1	10	100	1,000
C1-C5 (PPM)			
150	1.5E3	1.5E4	1.5E6

311u

267u

12000-12092 MRLST
(90%): dk gy-dk gyshbn,
frm-sl hd, brit, sb
blky-splt ctngs, mnr CHK
intbds, tr pp mic pyr, mod
calc; CHK (10%): med
brn, dk brn, sb blky-sb
splt ctngs, sl frm-brit,
chky tex, tr vf lam, hi calc

