



Scale: 5" / 100'
Measured Depth Log

Well Name Melbon Ranch 4F-17H-M265

Location Sec. 17 T2N R65W

State Colorado

County Weld

Country USA

Rig Number Ensign 153

API Number 05123477560000

AFE # 16191471

Geographic Region Rockies

Field Wattenberg

Spud Date 9/18/2018

Drilling Completed Surface: 09/18/2018, Vertical-Lateral: 10/20/2018

Surface Coordinates Lat/Long: 40.1347873/-104.6961138

SHL: Sec: 17 Twp: 2N 65W
Footage: 1560 FSL 460 FWL

Bottom Hole Coordinates Proposed BHL: Sec: 17 Twp: 2N 65W
Footages: 1520 FSL 460 FEL

Ground Elevation 4,956'

K.B. Elevation 4,979'

Logged Interval 120' To 12,127'

Total Depth 12,127'

Formation Codell

Type of Drilling Fluid Surface: Water Base Mud ; Synthetic Oil Base Mud

Operator

Company Crestone Peak Resources

Address 1801 California Street
Suite 2500
Denver, CO 80202



CRESTONE PEAK
RESOURCES

Geologist

Name John Ready

Company Crestone Peak Resources

Address 1801 California Street
Suite 2500
Denver, CO 80202



Zone Color Coding



Oil



Condensate



Gas



Note



Core



Pressure



Error



Water



Seal

Other

Loggers: Surface:Heather Davis, Shana Swirin/Vertical-Lateral: Shana Swirin, Matthew Cox

Services Provided: 2-Man Mudlogging

Equipment: ML-567

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

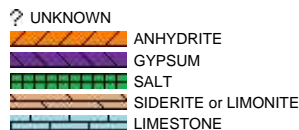
Service Start Date 09/18/2018

Service End Date Surface:09/18/2018 Vertical-Lateral: 10/20/2018

Job #: 1602RK1809

Release Date 10/21/2018

Rock Types



Accessories

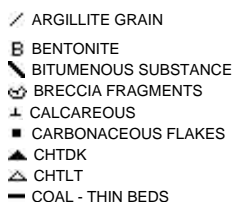
Fossils



F FOSSIL



ARGILLACEOUS



GLAUCONITE



Stringer



- CRINOID
- ECHINOID
- FISH
- FORAMINIFERA

- STROMATOPOROID
- ANHYDRITIC

Minerals

- DOLOMITIC
- FELDSPAR
- FERRUGINOUS PELLET
- FERRUGINOUS

- SANDY
- SILICEOUS
- SILTY
- TUFFACEOUS

- 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

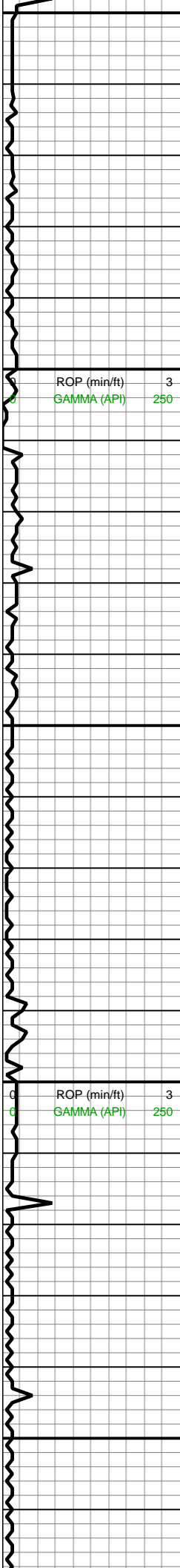
Textures

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

- LITHOGRAPHIC
- MICROXLN
- MUDSTONE
- PACKSTONE
- WACKESTONE

Sorting

- MODERATE
- POOR
- WELL



MD: 275'
INC: 0.7°
AZM: 338.82°
TVD: 275'
VS: -0.29'

✱ Isotube - 6u

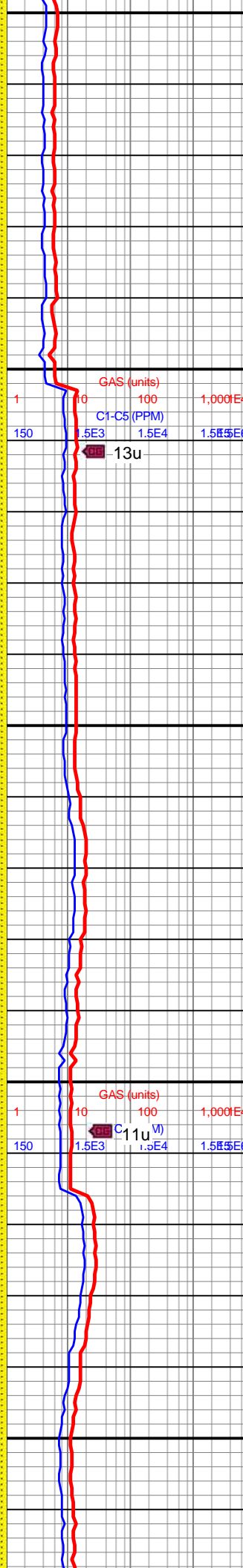
MD: 369'
INC: 2.2°
AZM: 313.51°
TVD: 368.96'
VS: -1.81'

✱ Isotube - 11u

WOB: 7klbs
RPM: 31
SPM: 158
SPP: 637psi

MW IN: 8.4
VIS IN: 28
MW OUT: 8.8
VIS OUT: 29

MD: 443'
INC: 2.9°
AZM: 312.33°
TVD: 442.89'
VS: -4.22'



buoyant, non calc

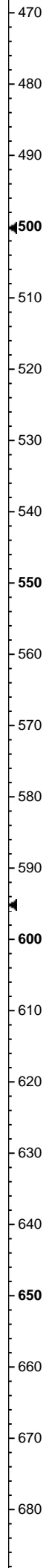
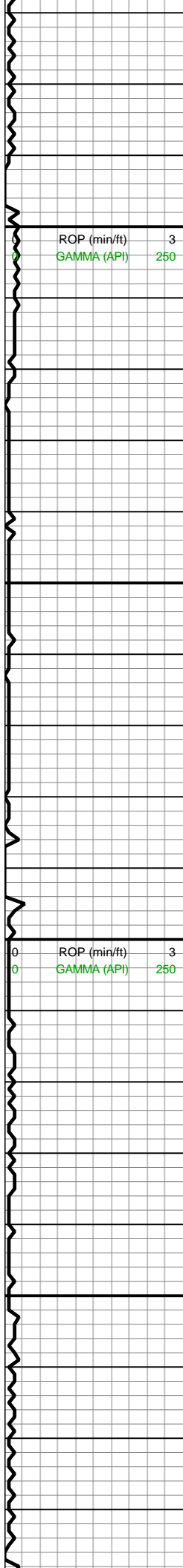
250-300 SST (75%):
wh-lt gy, w srted f sb rd-rd
cons sd grs, sb ang ip,
sft arg cmt-v fri silc cmt,
predy non calc, sl calc ip;
COAL (25%): blk, frm,
buoyant, non calc

300-350 SST (80%):
wh-lt gy, w srted f sb rd-rd
cons sd grs, sb ang ip,
sft arg cmt-v fri silc cmt,
sl calc ip; COAL (20%):
blk, frm, buoyant, non
calc

350-400 SST (85%):
wh-lt gy, w srted f sb rd-rd
cons sd grs, sb ang ip,
sft arg cmt-v fri silc cmt,
sl calc ip; COAL (15%):
blk, frm, buoyant, non
calc

400-450 SST (95%):
wh-lt gy, sme lt brn, w
srted f sb rd-rd cons sd
grs, sb ang ip, sft arg
cmt-v fri silc cmt, sl calc
ip; COAL (55%): blk, frm,
buoyant, non calc





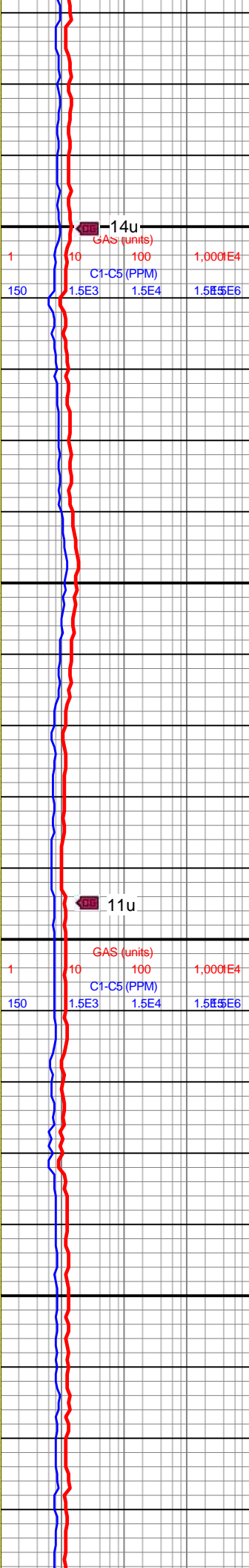
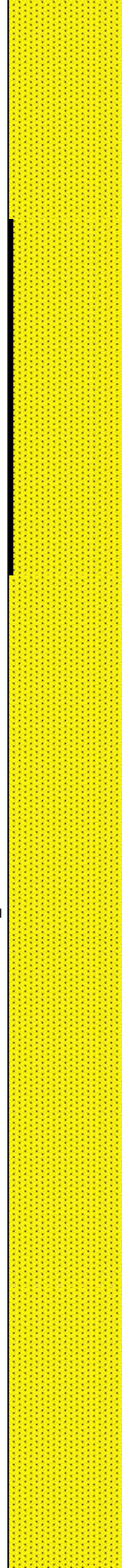
Isotube - 11u

MD: 538'
INC: 4.22°
AZM: 306.97°
TVD: 537.7'
VS: -8.79'

Isotube - 11u

WOB: 0.5klbs
RPM: 40
SPM: 214
SPP: 1,053psi

MD: 632'
INC: 5.14°
AZM: 306.12°
TVD: 631.39'
VS: -14.96'



450-500 SST (100%):
wh-lt gy, sme lt brn, w
srtd f sb rd-rd cons sd
grs, sb ang ip, sft arg
cmt-v fri silc cmt, sl calc
ip, tr COAL

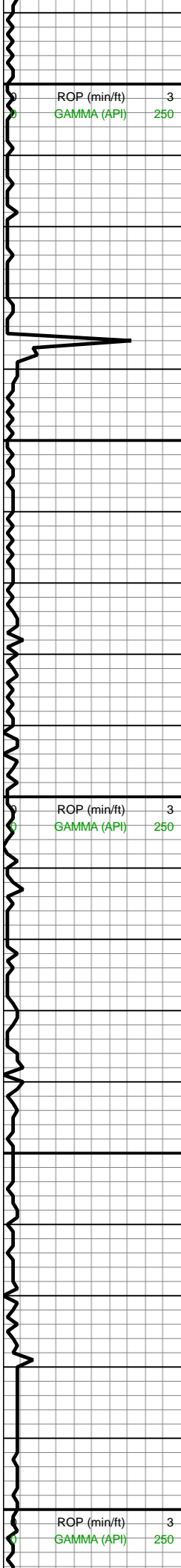
500-550 SST (95%):
wh-lt gy, sme lt brn, w
srtd f sb rd-rd cons sd
grs, sb ang ip, sft arg
cmt-v fri silc cmt, sl calc
ip; COAL (55%): blk, frm,
buoyant, non calc

550-600 SST (100%):
wh-lt gy, sme lt brn, w
srtd f sb rd-rd cons sd
grs, sb ang ip, cal cmt, sl
calc ip, tr COAL

600-650 SST (100%):
wh-lt gy, sme lt brn, w
srtd f sb rd-rd cons sd
grs, sb ang ip, cal cmt, sl
calc ip, tr COAL

650-700 SST (100%):





690
700
710
720
730
740
750
760
770
780
790
800
810
820
830
840
850
860
870
880
890
900

✱ Isotube - 9u

MD: 726'
INC: 5.99°
AZM: 304.08°
TVD: 724.95'
VS: -22.43'

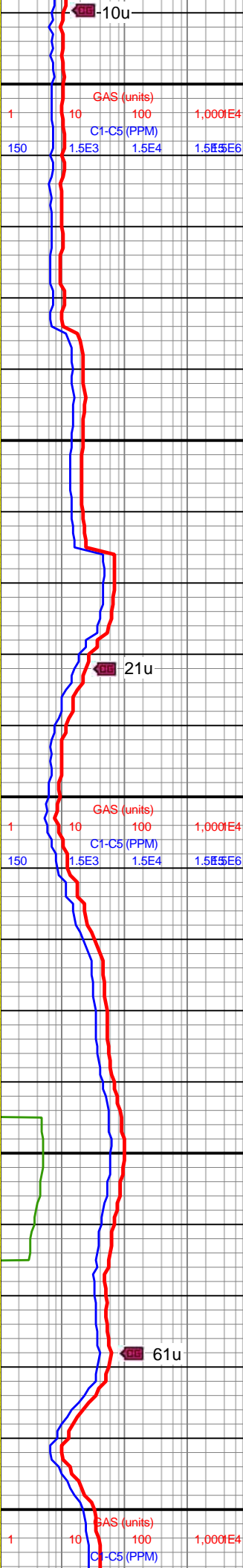
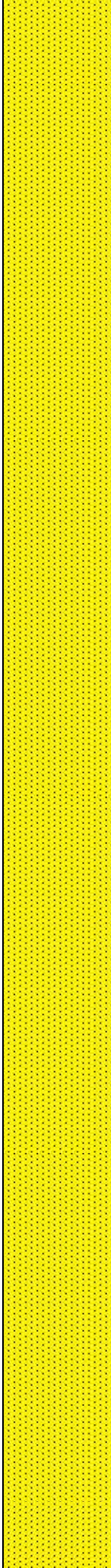
✱ Isotube - 11u

WOB: 6.2klbs
RPM: 40
SPM: 218
SPP: 1,287psi

MD: 821'
INC: 5.85°
AZM: 300.24°
TVD: 819.44'
VS: -30.72'

MW IN: 8.6
VIS IN: 29
MW OUT: 9.0
VIS OUT: 30

✱ Isotube - 6u



wh-lt gy, sme lt brn, w
srted f sb rd-rd cons sd
grs, sb ang ip, cal cmt, sl
calc ip, tr COAL

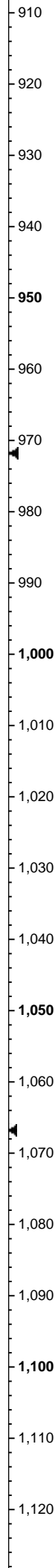
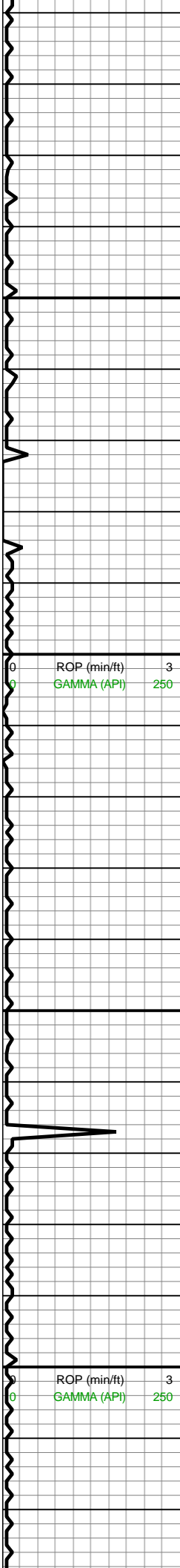
700-750 SST (100%):
wh-lt gy, sme lt brn, w
srted f sb rd-rd cons sd
grs, sb ang ip, cal cmt, sl
calc ip, tr COAL

750-800 SST (100%):
wh-lt gy, w srted f sb rd-rd
cons sd grs, sb ang ip,
cal cmt, sl calc ip, rr
COAL

800-850 SST (100%):
wh-lt gy, w srted f sb rd-rd
cons sd grs, sb ang ip,
cal cmt, sl calc ip, rr
COAL

850-900 SST (100%):
wh-lt gy, w srted f sb rd-rd
cons sd grs, sb ang ip,
cal cmt, sl calc ip, rr
COAL



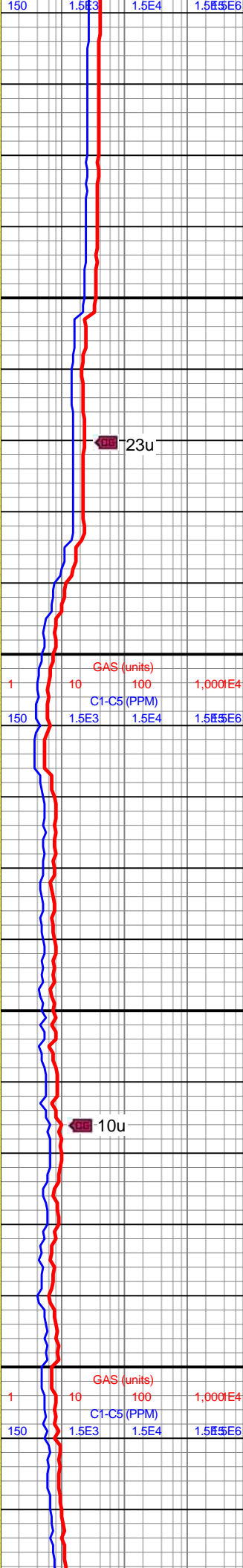
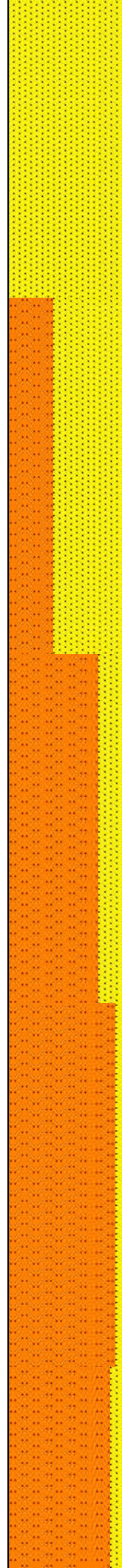


MD: 915'
INC: 4.42°
AZM: 303.41°
TVD: 913.06'
VS: -37.88'

✱ Isotube - 7u
WOB: 9.3klbs
RPM: 40
SPM: 218
SPP: 1,535psi

MD: 1,010'
INC: 4.11°
AZM: 298.35°
TVD: 1,007.8'
VS: -43.93'

✱ Isotube - 7u
MD: 1,104'
INC: 4.13°
AZM: 299.6°
TVD: 1,101.55'
VS: -49.84'

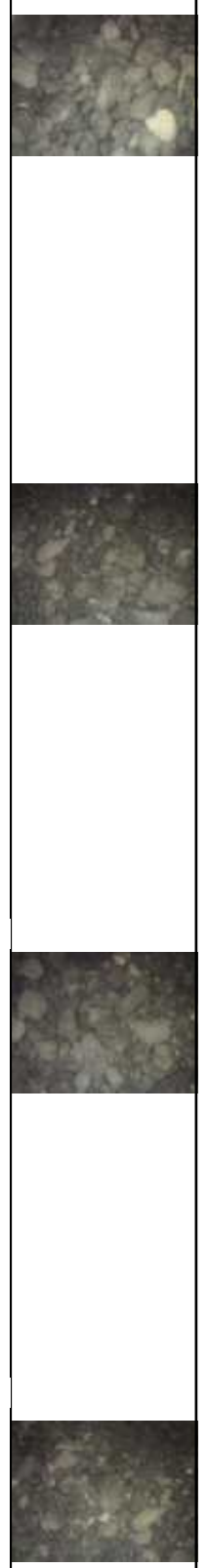


900-950 SST (100%):
wh-lt gy, w srted f sb rd-rd
cons sd grs, sb ang ip,
cal cmt, sl calc ip, rr
COAL

950-1000 SST (60%):
wh-lt gy, w srted f sb rd-rd
cons sd grs, sb ang ip,
cal cmt, sl calc ip; SLTST
(40%): pred med gy-sl dk
gy, sft-sl frm, blkly, sl calc

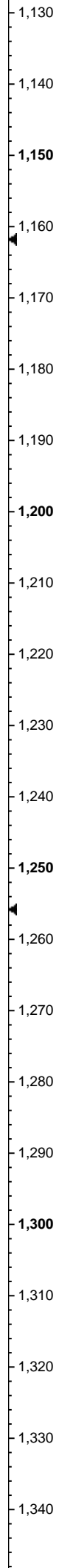
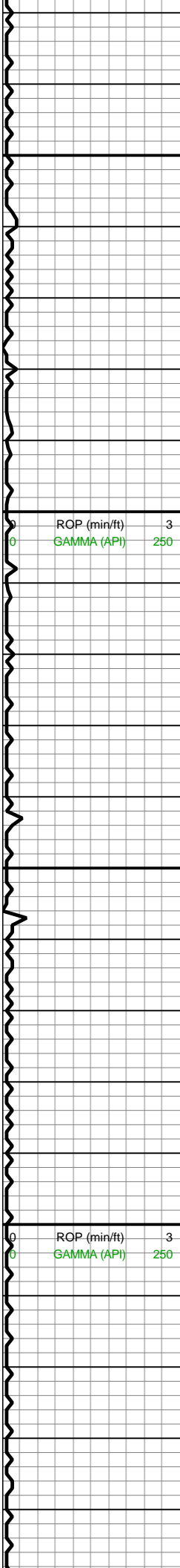
1000-1050 SLTST (80%):
pred med gy-sl dk gy,
sft-sl frm, blkly, sl calc;
SST (20%): lt gy, w srted f
sb rd-rd cons sd grs, sb
ang ip, cal cmt, sl calc ip

1050-1100 SLTST (95%):
pred med gy-sl dk gy,
sft-sl frm, blkly, sl calc;
SST (5%): lt gy, w srted f
sb rd-rd cons sd grs, sb
ang ip, cal cmt, sl calc ip



23u

10u



MD: 1,198'
INC: 4.29°
AZM: 300.82°
TVD: 1,195.3'
VS: -55.81'

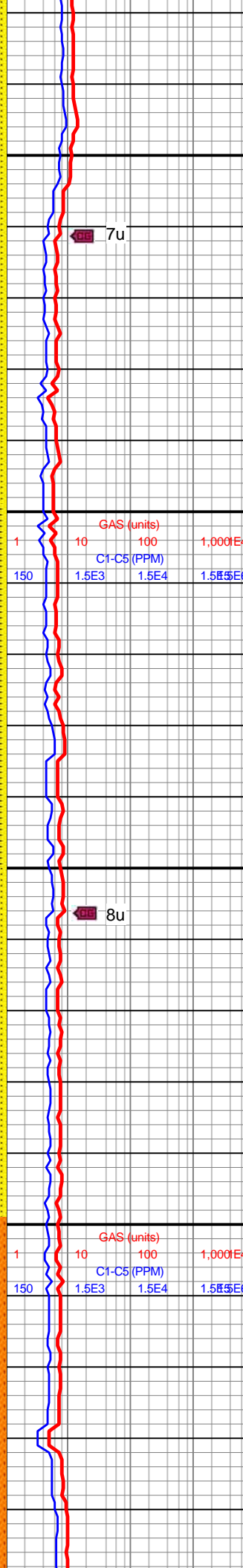
Isotube - 6u

WOB: 12.8klbs
RPM: 40
SPM: 218
SPP: 1,718psi

MD: 1,293'
INC: 4.68°
AZM: 298.35°
TVD: 1,290.01'
VS: -62.27'

Isotube - 6u

MW IN: 8.5+
VIS IN: 30
MW OUT: 9.3
VIS OUT: 31



1100-1150 SLTST (90%):
pred med gy-sl dk gy,
sft-sl frm, blkyl, sl calc,
tr-sme pyr; SST (10%): lt
gy, sme wh, w srtd f sb
rd-rd cons sd grs, sb ang
ip, cal cmt, sl calc ip

7u

1150-1200 SLTST (85%):
pred med gy-sl dk gy,
sft-sl frm, blkyl, sl calc,
tr-sme pyr; SST (15%): lt
gy, sme wh, w srtd f sb
rd-rd cons sd grs, sb ang
ip, cal cmt, sl calc ip

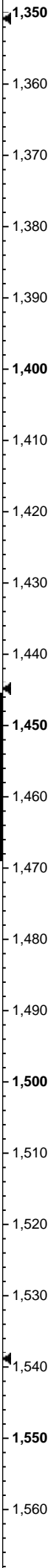
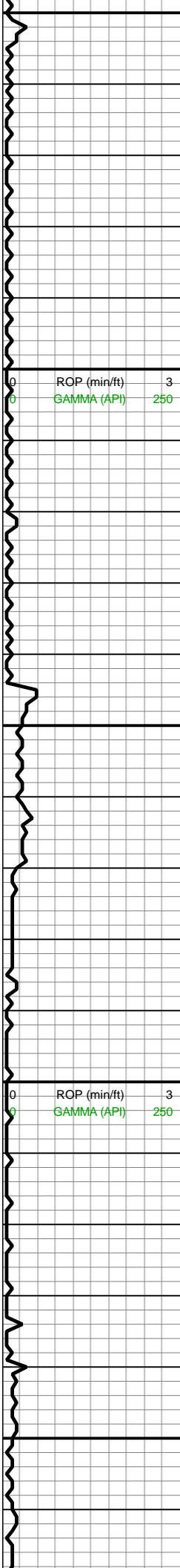
1200-1250 SLTST (95%):
pred med gy-sl dk gy,
sft-sl frm, blkyl, sl calc,
tr-sme pyr; SST (5%): lt
gy, sme wh, w srtd f sb
rd-rd cons sd grs, sb ang
ip, cal cmt, sl calc ip

8u

1250-1300 SLTST (90%):
pred med gy-sl dk gy,
sft-sl frm, blkyl, sl calc,
tr-sme pyr; SST (10%): lt
gy, sme wh, w srtd f sb
rd-rd cons sd grs, sb ang
ip, cal cmt, sl calc ip

1350-1400 (100%)
SLTST: pred med gy wi v
l dk gy,sl sm, pred rnd wi
sl sub ang, rr-occ pyr, tr
micmica sme calc:





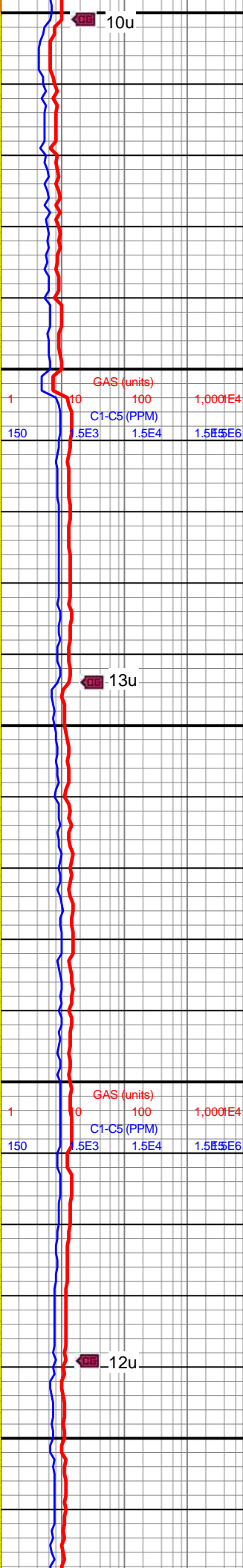
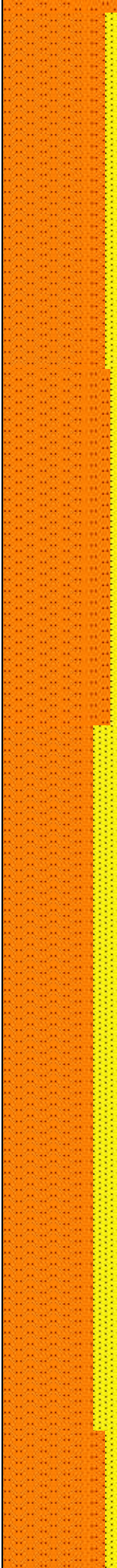
MD: 1,387'
INC: 5.47°
AZM: 293.06°
TVD: 1,383.64'
VS: -69.77'

✱ Isotube - 7u
WOB: 11.8klbs
RPM: 40
SPM: 216
SPP: 1,740psi

MD: 1,481'
INC: 4.79°
AZM: 302.71°
TVD: 1,477.26'
VS: -77.19'

✱ Isotube - 13u

MW IN: 8.9
VIS IN: 30
MW OUT: 9.2
VIS OUT: 30

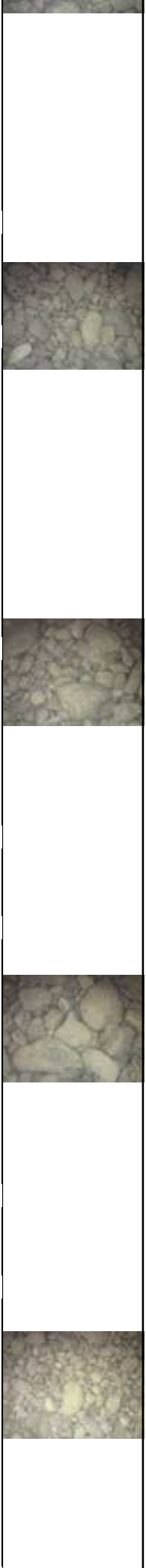


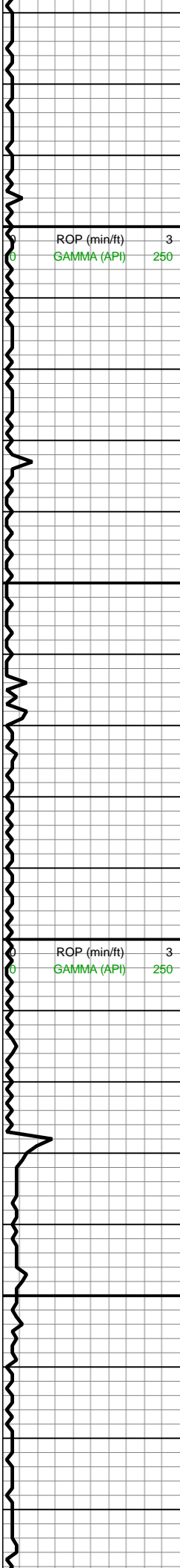
1350-1400 SLTST (90%):
pred med gy-sl dk gy,
sft-sl frm, blk, sl calc,
tr-sme pyr; SST (10%): lt
gy, sme wh, w srted f sb
rd-rd cons sd grs, sb ang
ip, cal cmt, sl calc ip

1400-1450 SLTST (95%)
v med gy, frm-sl brit,
blk-sub blk, sl sm tex
wi sme tr pp pyr, v hi calc;
SST(5%) pred lt gy wi
offwht cmt, frm,c-f, v hi
calc

1450-1500 SLTST (80%):
pred med gy-gyshbn,
sme lt gy, frm, sme v frm,
blk-plty, pred calc, sme
non calc, tr micmica, tr pp
pyr; SS (20%): pred
offwht-wht-lt gy, sme tn,
hrd, pred w cons cls
cons wi silc cmt, vf-f sb
ang-sb rd mod-w srted
grns, arg ip

1450-1500 SLTST (80%):
pred med gy-gyshbn,
sme lt gy, frm, sme v frm,
blk-plty, pred calc, sme
non calc, tr micmica, tr pp
pyr; SS (20%): pred
offwht-wht-lt gy, sme tn,
hrd, pred w cons cls
cons wi silc cmt, vf-f sb
ang-sb rd mod-w srted
grns, arg ip



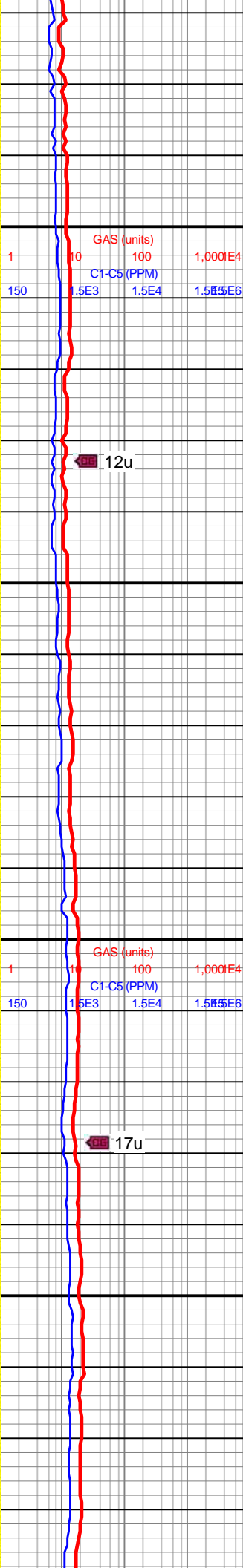
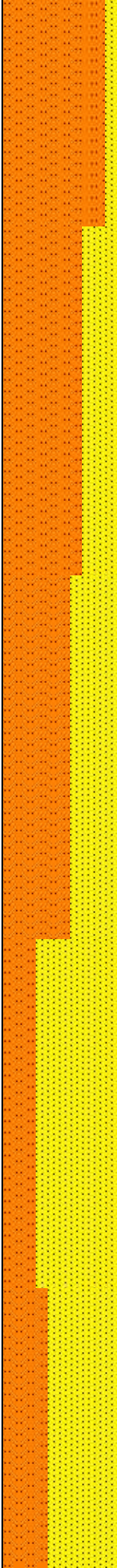


MD: 1,576'
INC: 5.09°
AZM: 306.34°
TVD: 1,571.91'
VS: -83.92'

WOB: 5.1klbs
RPM: 40
SPM: 216
SPP: 1,654psi

MD: 1,670'
INC: 6.27°
AZM: 306.59°
TVD: 1,665.45'
VS: -91.4'

MD: 1,765'
INC: 6.03°
AZM: 302.63°
TVD: 1,759.9'
VS: -99.77'



1550-1600 SLTST (90%):
pred med gy-gyshbn,
sme brn, frm, sft ip, blkly,
sme plty, non-sl calc,
com micmica; SST
(10%): pred lt gy-offwht,
sme wht, pred w cons cls
cons wi calc cmt, pred f-vf
grdg to slt mod-w srtd sb
ang-sb rd grns, arg ip

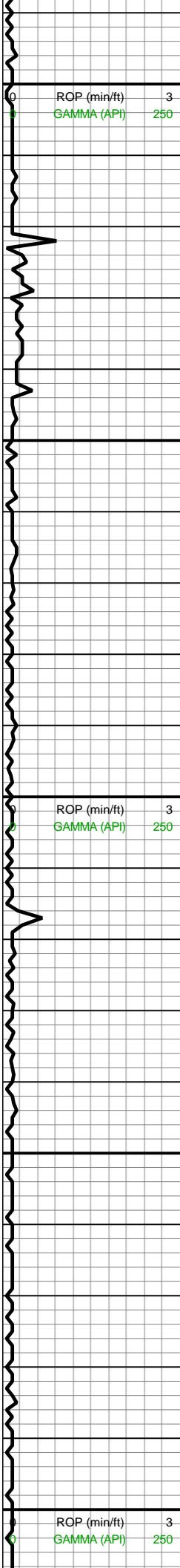
1600-1650 SLTST (70%):
pred med gy-gyshbn,
sme brn, frm, sft ip, blkly,
sme plty, non-sl calc,
com micmica; SS (30%):
pred lt gy-offwht, sme
wht, pred w cons cls
cons wi calc cmt, pred f-vf
grdg to slt mod-w srtd sb
ang-sb rd grns, arg ip

1650-1700 SLTST (60%):
pred med gy-gyshbn,
sme brn, frm, sft ip, blkly,
sme plty, non-sl calc,
com micmica; SS (40%):
pred lt gy-offwht, sme
wht, pred w cons cls
cons wi calc cmt, pred f-vf
grdg to slt mod-w srtd sb
ang-sb rd grns, arg ip

1700-1750 SS (70%):
pred lt gy-offwht, sme
wht, pred w cons cls
cons wi calc cmt, pred f-vf
grdg to slt mod-w srtd sb
ang-sb rd grns, arg ip;
SLTST (30%): pred med
gy-gyshbn, sme brn, frm,
sft ip, blkly, sme plty,
non-sl calc, com
micmica

1750-1800 SS (60%):
pred lt gy-offwht, sme
wht, pred w cons cls
cons wi calc cmt, pred f-vf
grdg to slt mod-w srtd sb
ang-sb rd grns, arg ip;
SLTST (40%): pred med





WOB: 22.1klbs
RPM: 40
SPM: 216
SPP: 1,632psi

✱ Isotube - 13u

MW IN: 8.9
VIS IN: 30
MW OUT: 9.1
VIS OUT: 30

MD: 1,860'
INC: 4.48°
AZM: 298.28°
TVD: 1,854.5'
VS: -107.24'

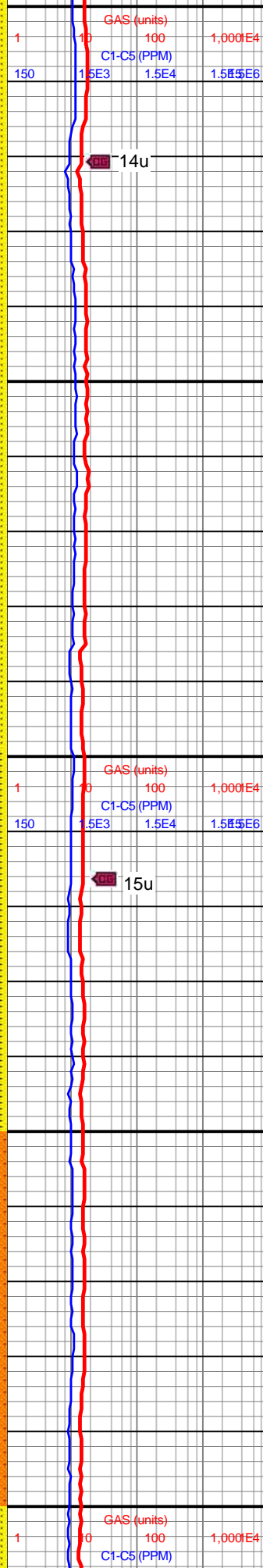
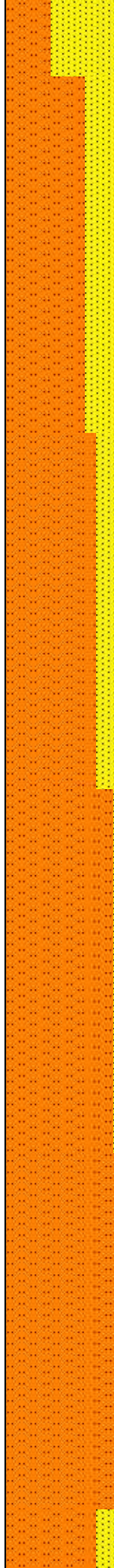
✱ Isotube - 14u

MD: 1,954'
INC: 4.36°
AZM: 293.68°
TVD: 1,948.22'
VS: -113.74'

WOB: 24.6klbs
RPM: 40
SPM: 215
SPP: 1,812psi

✱ Isotube - 14u

MW IN: 8.7



gy-gyshbn, sme brn, frm,
sft ip, blk, sme plty,
non-sl calc, com
micmica

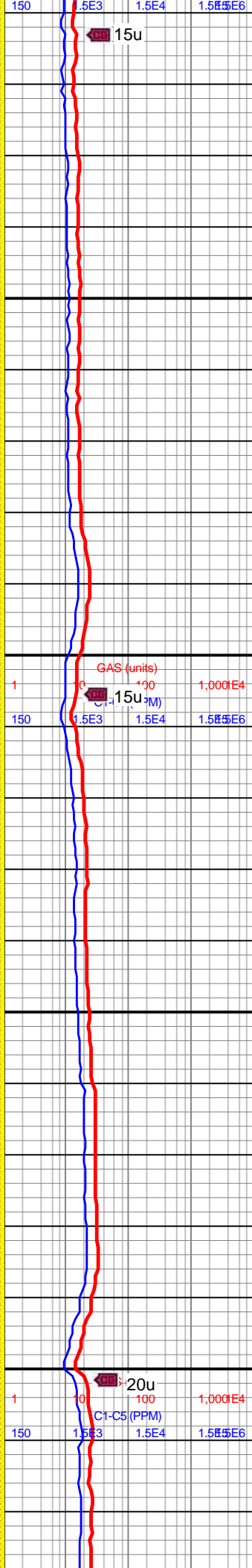
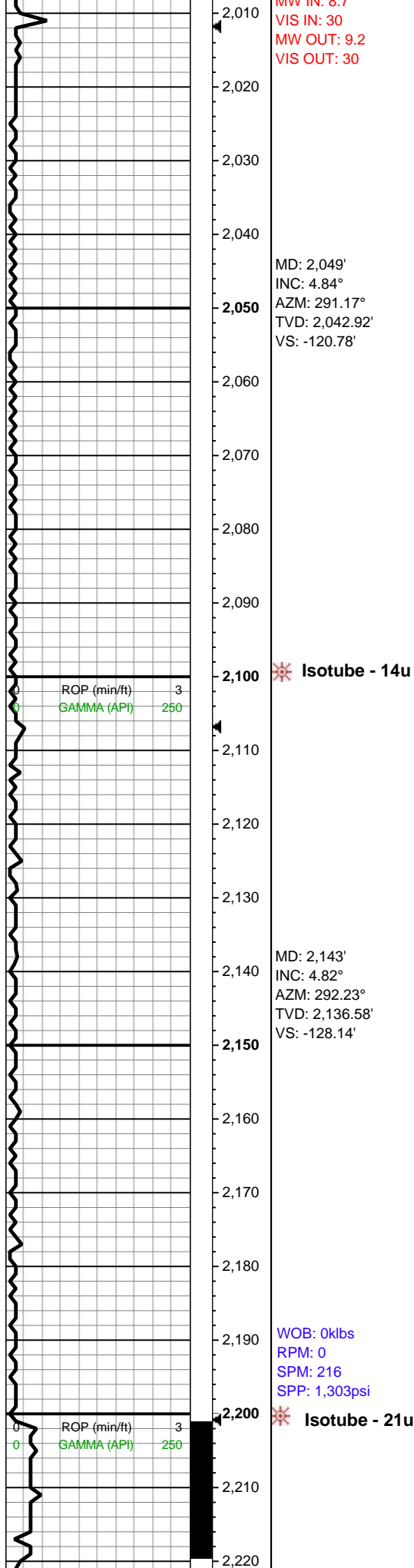
1800-1850 SLTST
(70%): pred dk gy-sk
gyshbn, frm, sme sft,
blk, non-sl calc, intbdd
wi ss; SS (30%): med gy,
sme lt gy, frm-hrd w cons
cls cons wi cal cmt, vf
grnd grdg to slt, sb
ang-ang mod-w srtd, tr
pp pyr

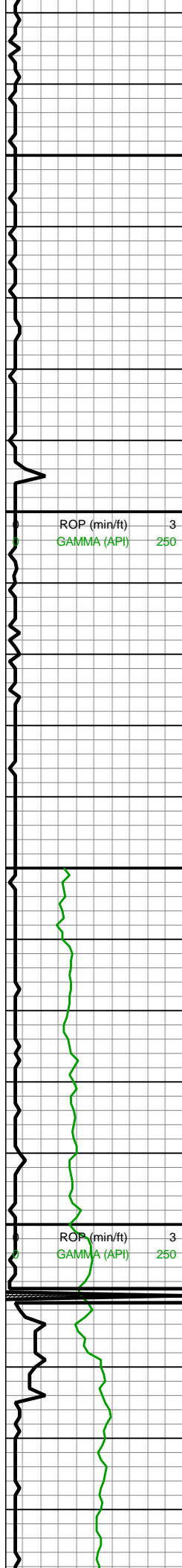
1850-1900 SLTST
(80%): pred dk gy-sk
gyshbn, frm, sme sft,
blk, non-sl calc, intbdd
wi ss; SS (20%): med gy,
sme lt gy, frm-hrd w cons
cls cons wi cal cmt, vf
grnd grdg to slt, sb
ang-ang mod-w srtd, tr
pp pyr

1900-1950 SLTST (95%):
pred dk gy-sk gyshbn,
frm, sme sft, blk, non-sl
calc, intbdd wi ss; SS
(5%): med gy, sme lt gy,
frm-hrd w cons cls cons
wi cal cmt, vf grnd grdg to
slt, sb ang-ang mod-w
srtd, tr pp pyr

1950-2000 SLTST
(100%): pred dk gy-sk
gyshbn, frm, sme sft,
blk, non-sl calc, intbdd
wi ss







MD: 2,238'
INC: 4.63°
AZM: 303.41°
TVD: 2,231.26'
VS: -135.04'

MW IN: 8.7
VIS IN: 29
MW OUT: 9.2
VIS OUT: 31

ROP (min/ft) 3
GAMMA (API) 250

Isotube - 28u

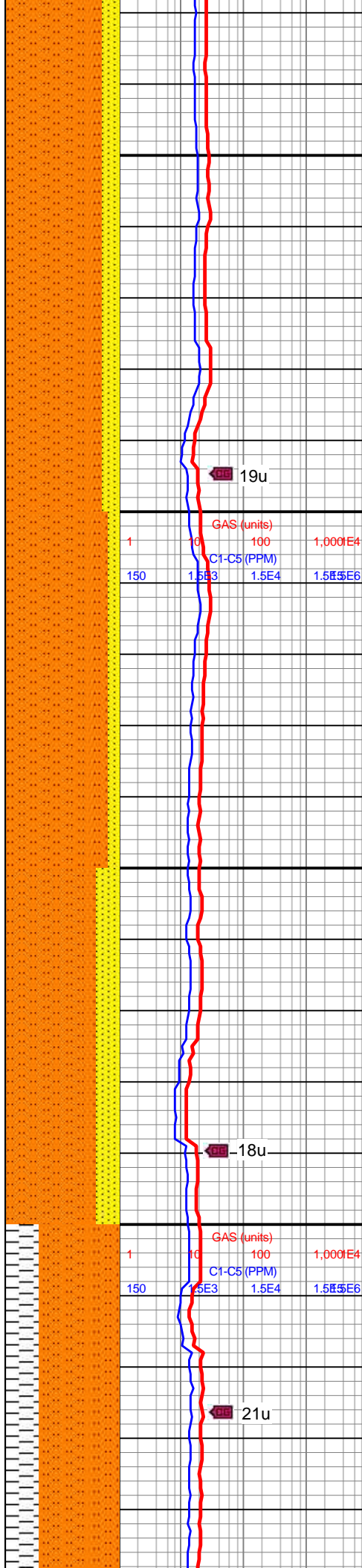
MD: 2,332'
INC: 4.47°
AZM: 307.68°
TVD: 2,324.97'
VS: -141.1'

WOB: 14.3klbs
RPM: 40
SPM: 216
SPP: 1,970psi

Isotube - 19u

Surface Total
Depth of 2,410'
reached
@10:31 on
09/18/2018

Bit #: 1
Type: U516M
Size: 8 1/2
Depth In: 2,410'
Depth Out: 7,160'
Hours: 19 hrs
Jets: 6x13
S/N: 43955



bi-ky, non-sl calc, intbdd
wi ss; SS (15%): med gy,
sme lt gy, frm-hrd w cons
cls cons wi cal cmt, vf
grnd grdg to slt, sb
ang-ang mod-w srted, tr
pp pyr

2250-2300 SLTST
(85%): pred dk gy-sk
gyshbn, frm, sme sft,
blky, non-sl calc, intbdd
wi ss; SS (15%): med gy,
sme lt gy, frm-hrd w cons
cls cons wi cal cmt, vf
grnd grdg to slt, sb
ang-ang mod-w srted, tr
pp pyr

19u

GAS (units)			
1	10	100	1,000E4
150	1.5E3	1.5E4	1.5E5E6

2300-2350 SLTST
(90%): pred dk gy-sk
gyshbn, frm, sme sft,
blky, non-sl calc, intbdd
wi ss; SS (10%): med gy,
sme lt gy, frm-hrd w cons
cls cons wi cal cmt, vf
grnd grdg to slt, sb
ang-ang mod-w srted, tr
pp pyr

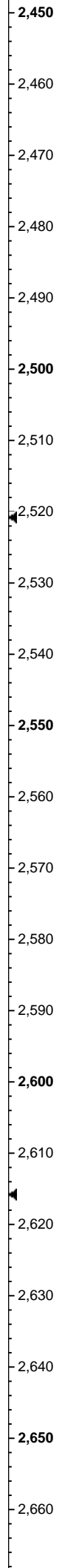
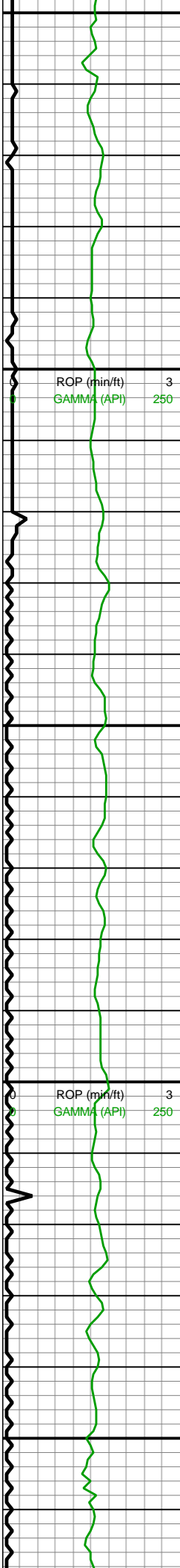
2350-2400 SLTST
(80%): pred dk gy-sk
gyshbn, frm, sme sft,
blky, non-sl calc, intbdd
wi ss; SS (20%): med gy,
sme lt gy, frm-hrd w cons
cls cons wi cal cmt, vf
grnd grdg to slt, sb
ang-ang mod-w srted, tr
pp pyr

18u

GAS (units)			
1	10	100	1,000E4
150	1.5E3	1.5E4	1.5E5E6

21u



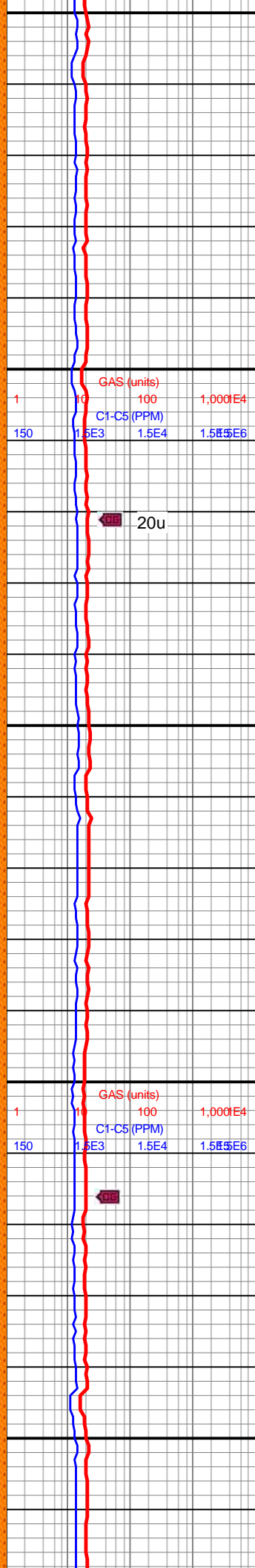
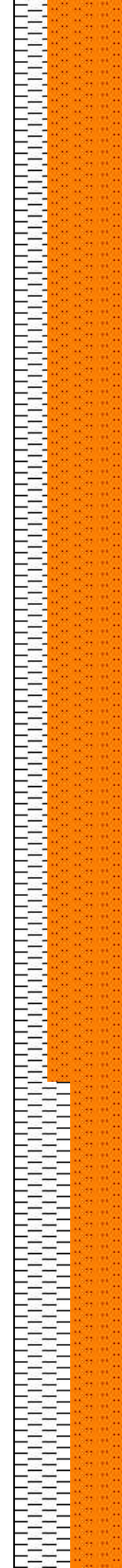


MD: 2,451'
INC: 4.31°
AZM: 316.11°
TVD: 2,443.62'
VS: -141.26'

MD: 2,545'
INC: 4.04°
AZM: 313.12°
TVD: 2,537.37'
VS: -145.79'

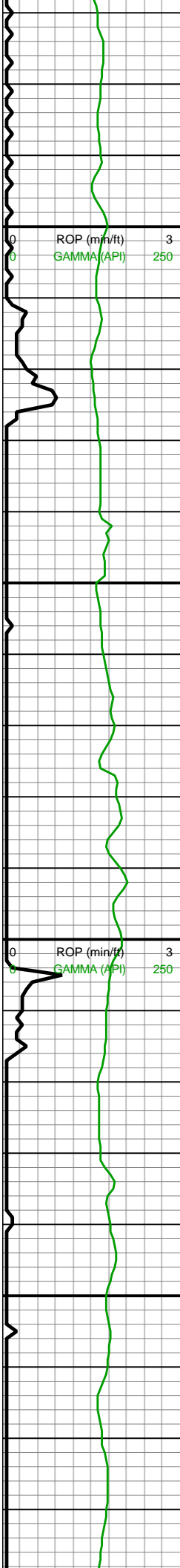
WOB: 34.8klbs
RPM: 50
SPM: 172
SPP: 2,507psi

MD: 2,639'
INC: 3.47°
AZM: 309.61°
TVD: 2,631.17'
VS: -150.11'



2400-2600 SLTST (70%):
pred dk gy-sk gyshbn,
frm, sme sft, blk, non-sl
calc, intbdd wi ss; SH
(30%): lt gy-med gy, mot
gyshbn, ang-sb blk,
sm-sl slty tex, sl frm-sft,
mod cly content, non
calc, tr SS





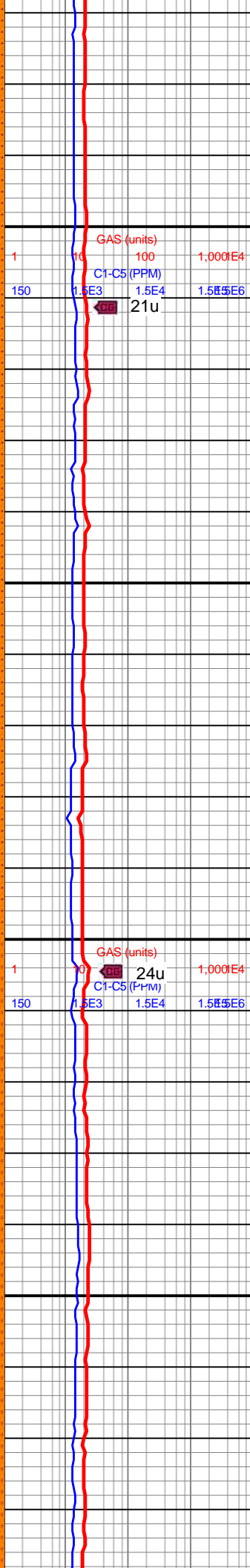
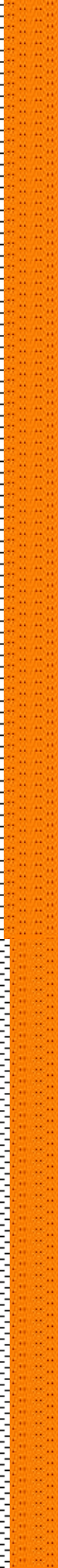
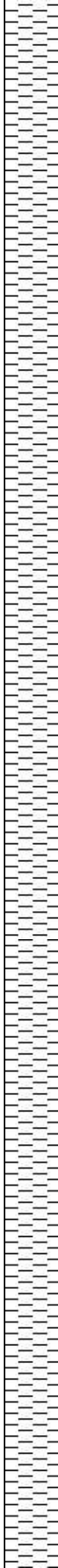
2,670
2,680
2,690
2,700
2,710
2,720
2,730
2,740
2,750
2,760
2,770
2,780
2,790
2,800
2,810
2,820
2,830
2,840
2,850
2,860
2,870
2,880

MD: 2,734'
INC: 3.87°
AZM: 322.26°
TVD: 2,725.97'
VS: -153.99'

WOB: 34.2klbs
RPM: 60
SPM: 200
SPP: 3,248psi

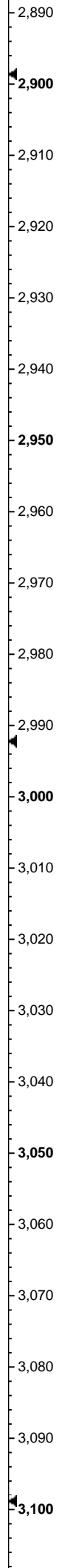
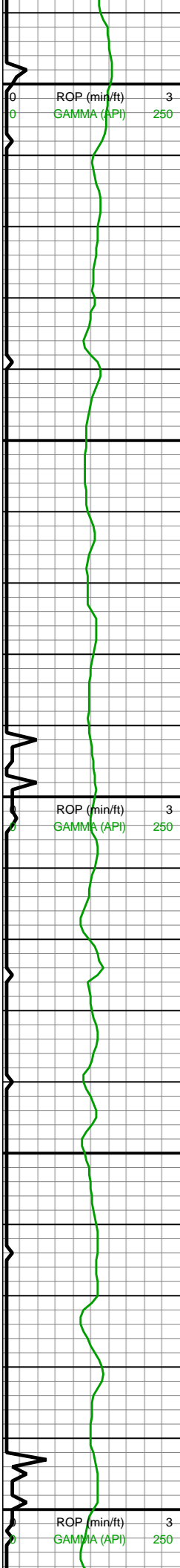
MW IN: 9.7
VIS IN: 55
MW OUT: 9.7
VIS OUT: 56

MD: 2,829'
INC: 4.4°
AZM: 309.17°
TVD: 2,820.73'
VS: -158.44'



2600-2800 SLTST (50%):
pred dk gy-sk gyshbn,
frm, sme sft, blk, non-sl
calc, intbdd wi ss; SH
(50%): lt gy-med gy, mot
gyshbn, ang-sb blk,
sm-sl slty tex, sl frm-sft,
mod cly content, non
calc, tr SS



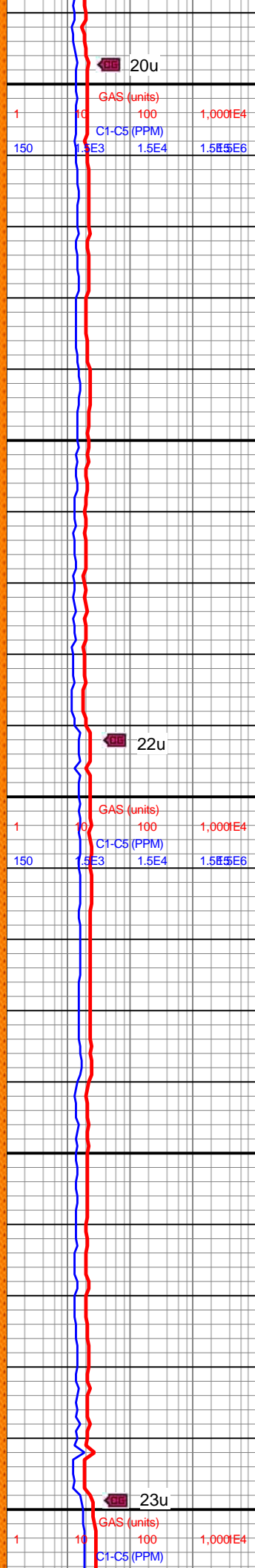
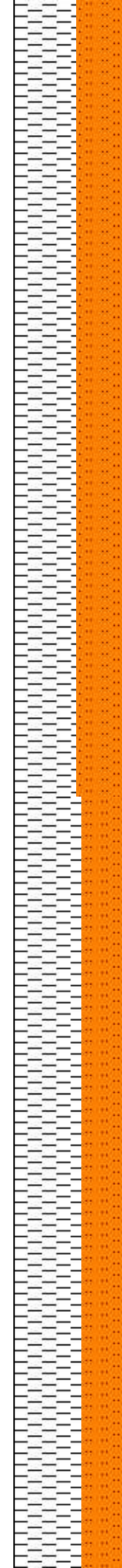


MD: 2,923'
INC: 4.26°
AZM: 308.9°
TVD: 2,914.46'
VS: -163.64'

WOB: 5.8klbs
RPM: 60
SPM: 202
SPP: 3,020psi

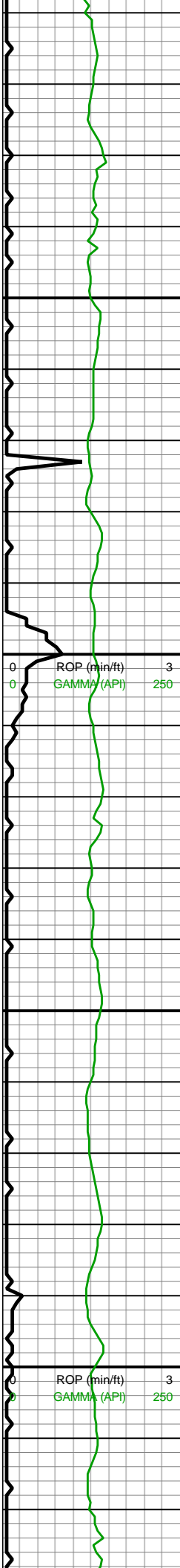
MD: 3,028'
INC: 3.91°
AZM: 306.97°
TVD: 3,019.19'
VS: -169.21'

MW IN: 9.7
VIS IN: 55
MW OUT: 9.6+
VIS OUT: 55



2800-3000 SH (55%): lt gy-med gy, mot gyshbn, ang-sb blkly, sl sm-sltly tex, sl frm-sft, mod cly content, non calc; SLTST (45%): pred dk gy-sk gyshbn, frm, sme sft, blkly, non-sl calc





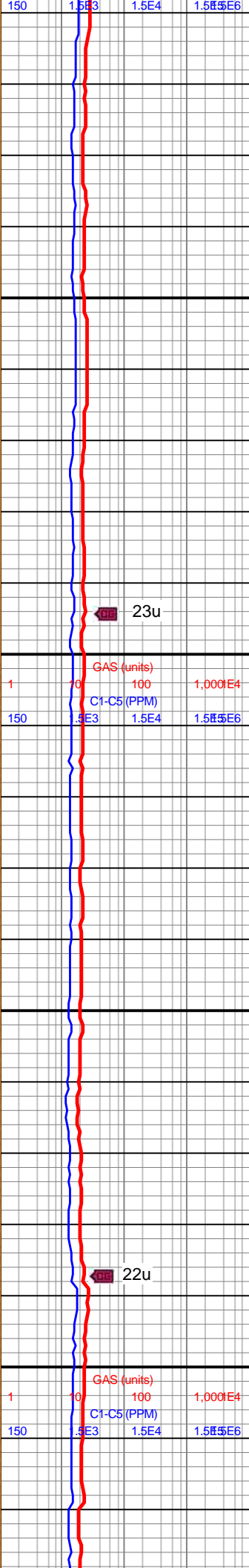
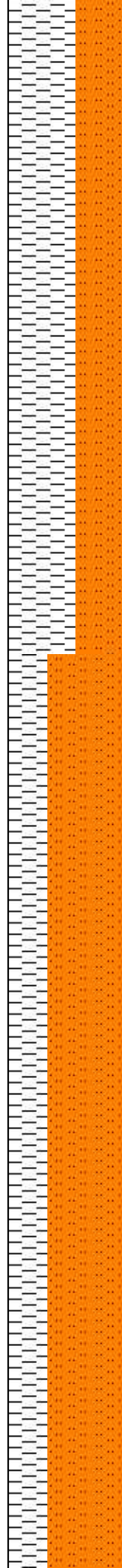
3,110
3,120
3,130
3,140
3,150
3,160
3,170
3,180
3,190
3,200
3,210
3,220
3,230
3,240
3,250
3,260
3,270
3,280
3,290
3,300
3,310
3,320

MD: 3,123'
INC: 3.43°
AZM: 304.77°
TVD: 3,114'
VS: -173.88'

WOB: 4.7klbs
RPM: 0
SPM: 170
SPP: 2,427psi

MD: 3,217'
INC: 3.96°
AZM: 325.95°
TVD: 3,207.81'
VS: -177.71'

MD: 3,312'
INC: 3.56°
AZM: 326.74°
TVD: 3,302.6'
VS: -180.81'

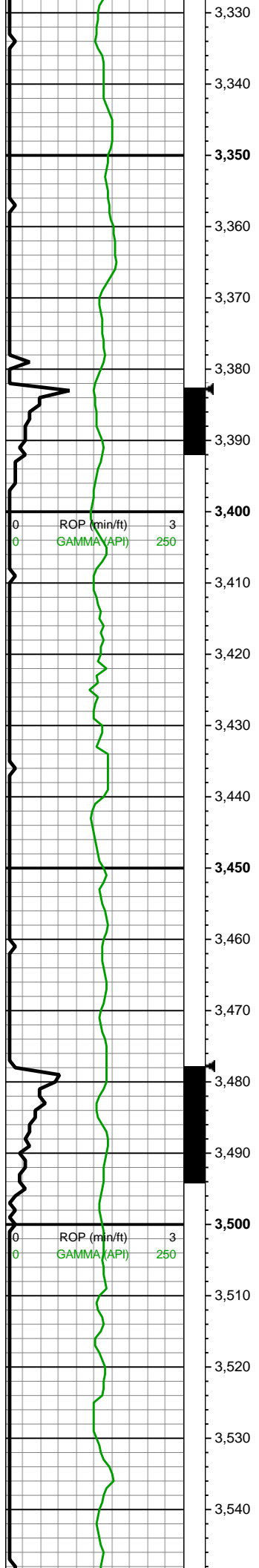


23u

22u

3000-3200 SH (60%): lt
gy-med gy, mot gyshbn,
ang-sb blk, sl sm-slt
tex, sl frm-sft, mod cly
content, non calc; SLTST
(40%): pred dk gy-sk
gyshbn, frm, sme sft,
blk, non-sl calc

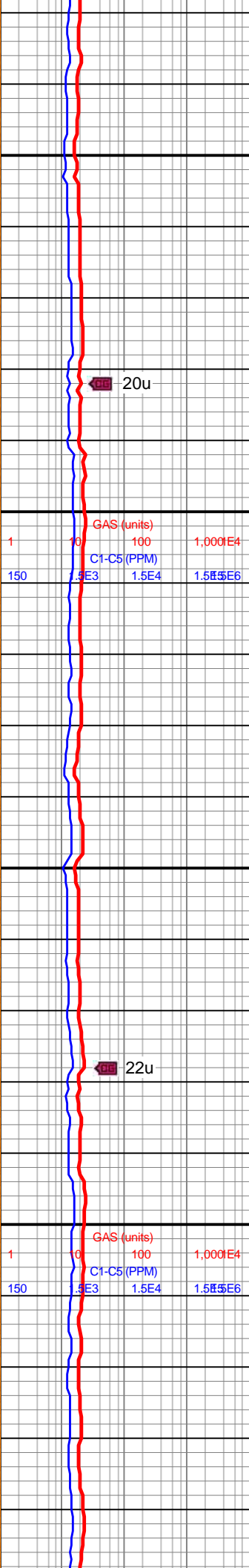
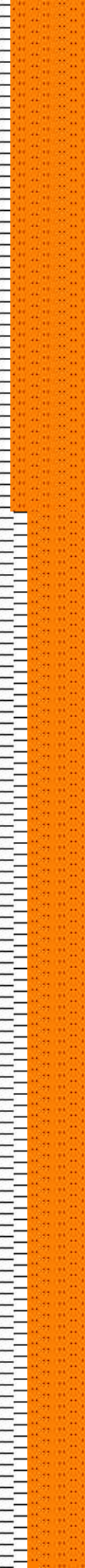




WOB: 33.4klbs
RPM: 60
SPM: 200
SPP: 3,738psi

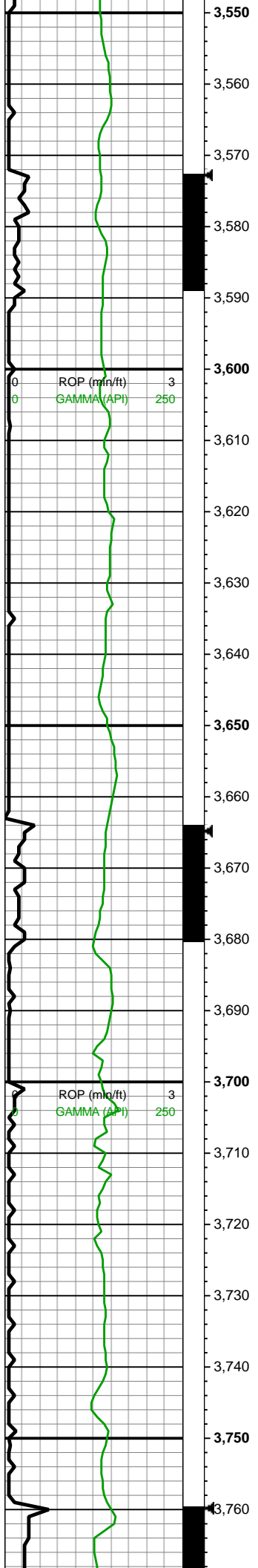
MD: 3,406'
INC: 2.81°
AZM: 302.49°
TVD: 3,396.46'
VS: -184.09'

MD: 3,501'
INC: 3.87°
AZM: 299.06°
TVD: 3,491.3'
VS: -188.66'



3200-3400 SLTST (65%):
pred dk gy-sk gyshbn,
frm, sme sft, blk, non-sl
calc; SH (45%): lt gy-med
gy, mot gyshbn, ang-sb
blk, sl sm-slt, tex, sl
frm-sft, mod cly content,
non calc



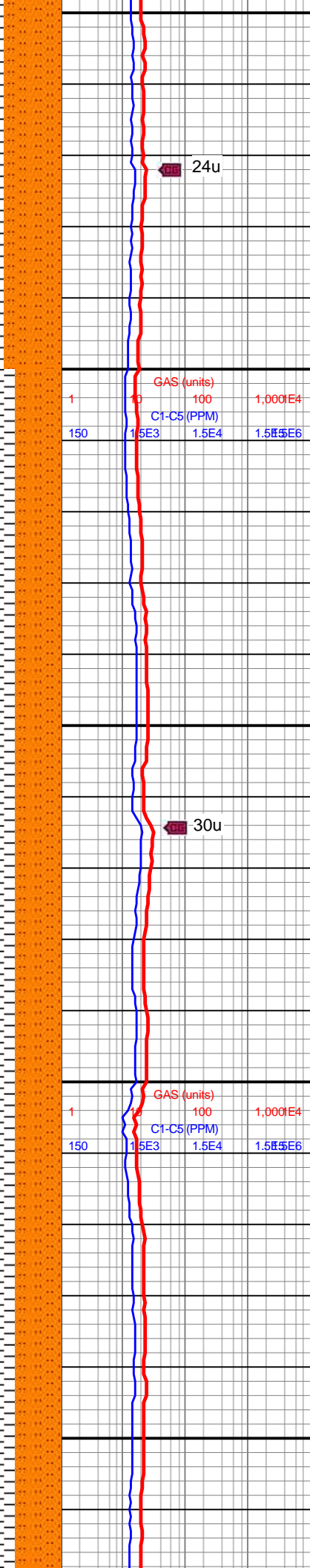


MD: 3,595'
INC: 4.48°
AZM: 303.89°
TVD: 3,585.05'
VS: -194.23'

WOB: 28klbs
RPM: 60
SPM: 202
SPP: 3,848psi

MD: 3,690'
INC: 4.66°
AZM: 310.57°
TVD: 3,679.75'
VS: -199.92'

MW IN: 9.7
VIS IN: 53
MW OUT: 9.7
VIS OUT: 51

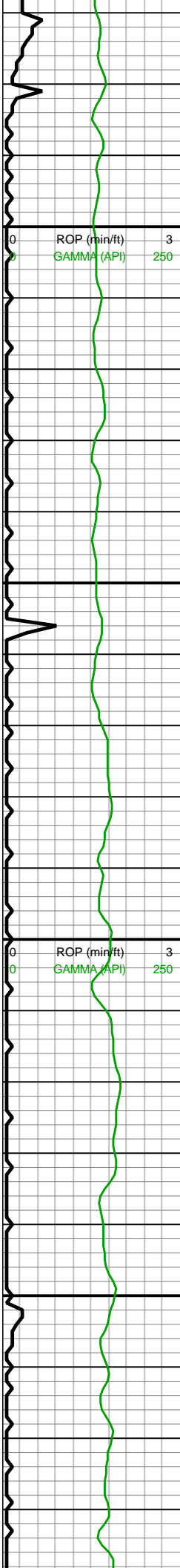


24u

30u

3400-3600 SLTST (50%):
pred dk gy-gyshbn, frm,
sme sft, blk, no calc; SH
(50%): lt gy-med gy, mot
gyshbn, ang-sb blk, sl
sm-slt, tex, sl frm-sft,
abnt cly content, sl calc



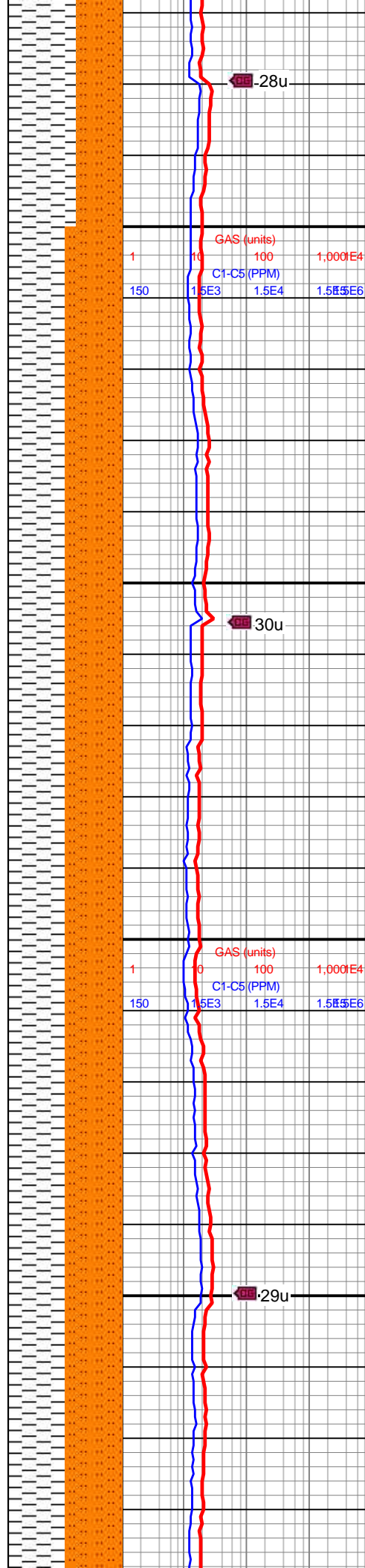


MD: 3,785'
INC: 6.24°
AZM: 303.72°
TVD: 3,774.31'
VS: -206.76'

WOB: 36.3klbs
RPM: 60
SPM: 202
SPP: 3,800psi

MD: 3,879'
INC: 6.15°
AZM: 307.85°
TVD: 3,867.77'
VS: -214.57'

MD: 3,974'
INC: 5.1°
AZM: 311.63°
TVD: 3,962.31'
VS: -221.33'



28u

30u

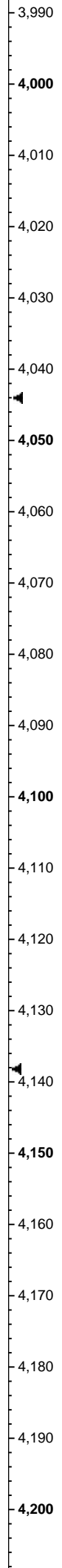
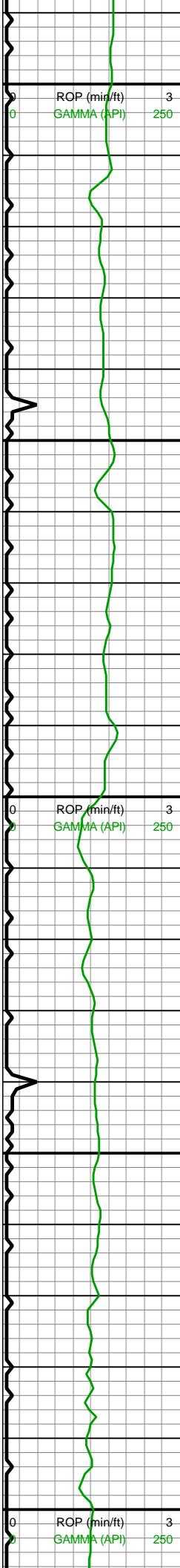
29u

3600-3800 SLTST (40%):
pred dk gy-gyshbn, frm,
sme sft, blk, no calc; SH
(60%): lt gy-med gy, occ
dk gy, ang-sb blk, sl
sm-slt, tex, sl frm-sft,
abnt cly content, sl calc



3800-4000 SLTST (50%):
pred dk gy-med gy, frm,
sme sft, blk, no calc; SH
(50%): lt gy-med gy, occ
dk gy, ang-sb blk, sl





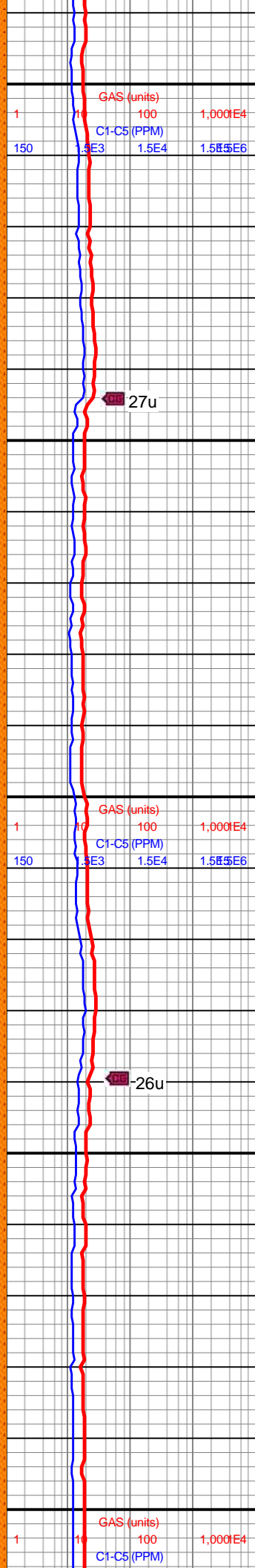
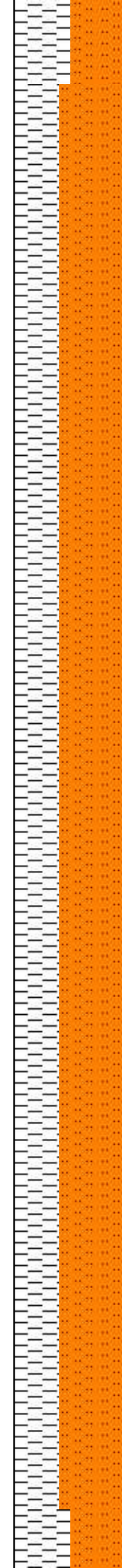
WOB: 29.8klbs
RPM: 60
SPM: 200
SPP: 3,890psi

MW IN: 9.6
VIS IN: 54
MW OUT: 9.6
VIS OUT: 50

MD: 4,068'
INC: 4.22°
AZM: 316.99°
TVD: 4,056'
VS: -226.44'

MD: 4,163'
INC: 3.91°
AZM: 319.01°
TVD: 4,150.76'
VS: -230.6'

WOB: 29.3klbs
RPM: 60
SPM: 201
SPP: 4,030psi

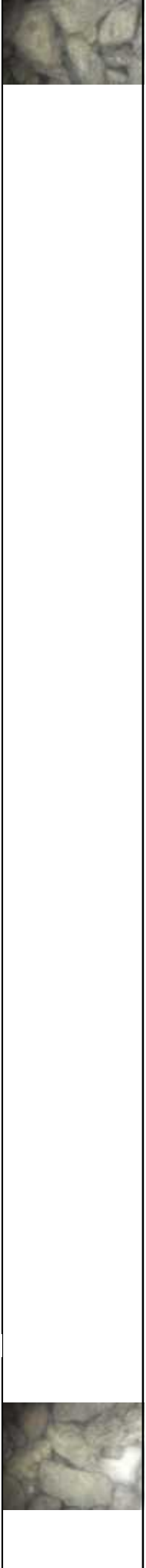


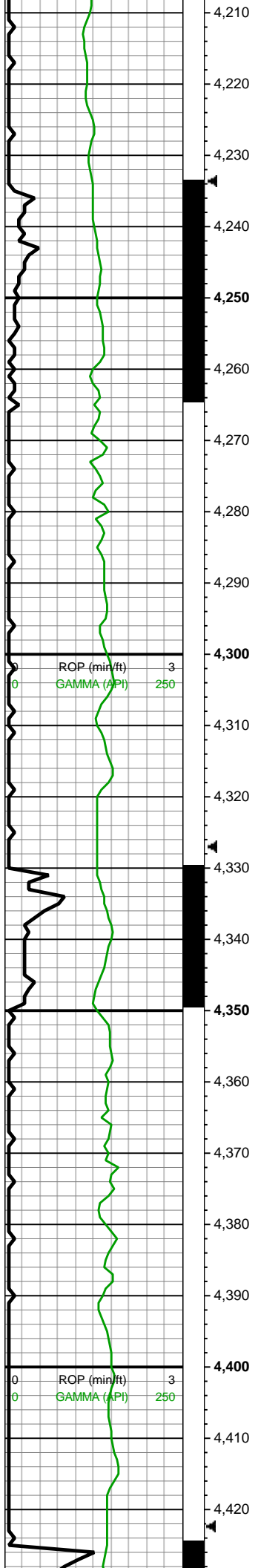
dk gy, ang-sb blk, sl sm-slt, abnt cly content, sl calc

27u

26u

4000-4200 SLTST (60%):
pred dk gy-lt gy, frm, sme sft, blk, no calc; SH (40%): lt gy-med gy, ang-sb blk, sl sm-slt, abnt cly content, sl calc



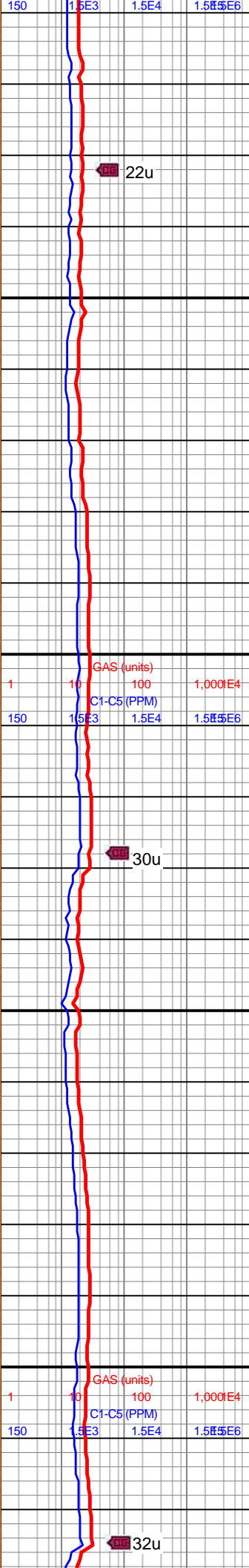
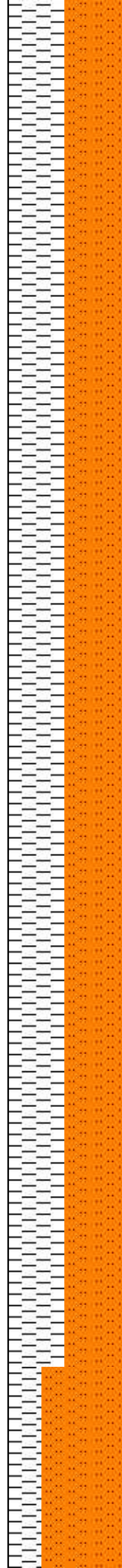


MW IN: 9.6+
VIS IN: 53
MW OUT: 9.6+
VIS OUT: 49

MD: 4,257'
INC: 4.22°
AZM: 326.48°
TVD: 4,244.52'
VS: -234.25'

MD: 4,351'
INC: 3.69°
AZM: 337.55°
TVD: 4,338.3'
VS: -236.93'

WOB: 28.4klbs
RPM: 60
SPM: 198
SPP: 4,050psi



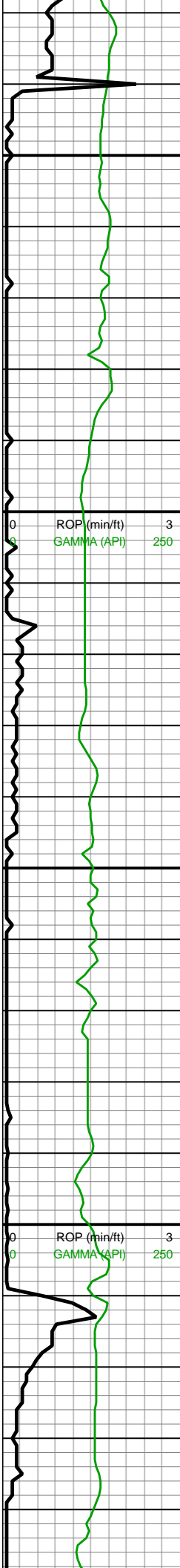
22u

30u

32u

4200-4400 SLTST (50%):
pred dk gy-lt gy, frm, sme
sft, blk, no calc; SH
(50%): lt gy-med gy,
ang-sb blk, sl sm-slt
tex, sl frm-sft, abnt cly, sl
calc





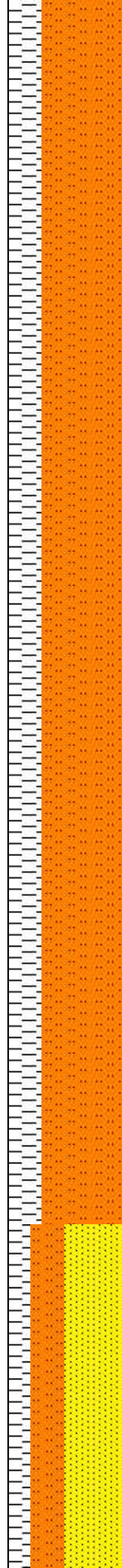
MD: 4,446'
INC: 3.21°
AZM: 352.85°
TVD: 4,433.13'
VS: -238.05'

MW IN: 9.6+
VIS IN: 52
MW OUT: 9.6+
VIS OUT: 48

MD: 4,540'
INC: 5.89°
AZM: 352.14°
TVD: 4,526.82'
VS: -238.54'

WOB: 28klbs
RPM: 60
SPM: 202
SPP: 4,210psi

MD: 4,635'
INC: 5.63°
AZM: 325.87°
TVD: 4,621.36'
VS: -241.23'



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

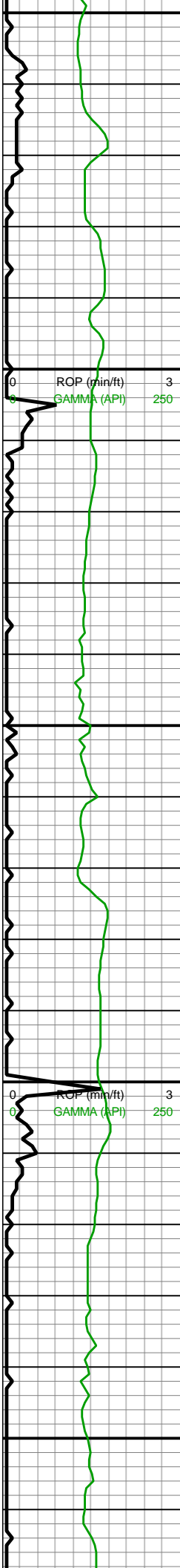
29u

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

24u

4400-4600 SLTST (70%):
pred dk gy-lt gy, frm, sme
sft, blk, no calc; SH
(30%): lt gy-med gy,
ang-sb blk, sl sm-slt
tex, sl frm-sft, abnt cly, sl
calc





4,650
4,660
4,670
4,680
4,690
4,700
4,710
4,720
4,730
4,740
4,750
4,760
4,770
4,780
4,790
4,800
4,810
4,820
4,830
4,840
4,850
4,860

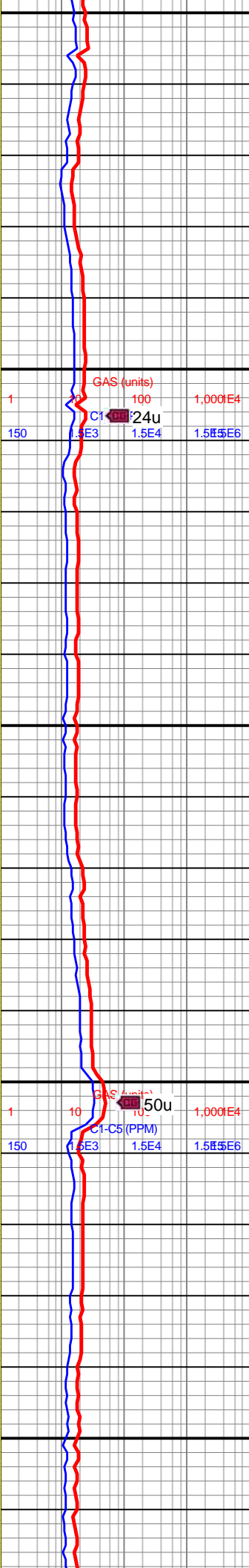
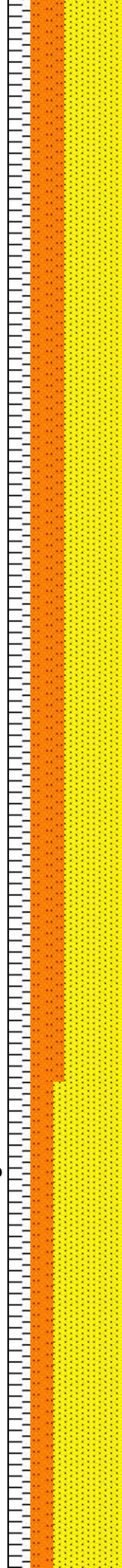
MW IN: 9.6+
VIS IN: 51
MW OUT: 9.7
VIS OUT: 47

MD: 4,729'
INC: 5.63°
AZM: 299.15°
TVD: 4,714.92'
VS: -247.42'

WOB: 35.2klbs
RPM: 60
SPM: 201
SPP: 4,310psi

Sussex
4,816'MD/4,801'TVD

MD: 4,823'
INC: 6.02°
AZM: 296.6°
TVD: 4,808.44'
VS: -255.54'

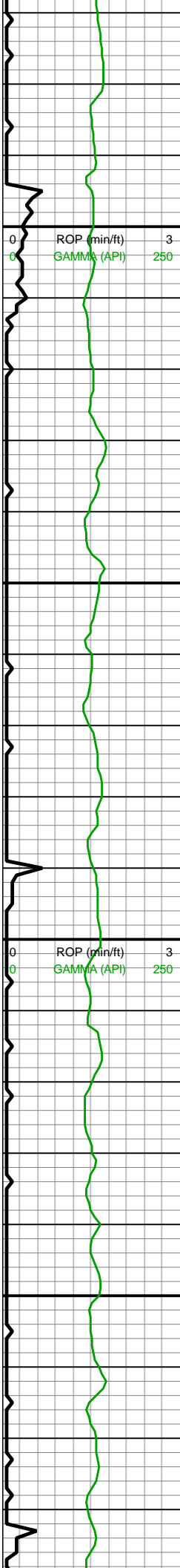


GAS (units)
1 100 1,000E4
C1-C5 (PPM)
150 1.5E3 1.5E4 1.5E6

GAS (units)
1 10 100 50u 1,000E4
C1-C5 (PPM)
150 1.5E3 1.5E4 1.5E6

4600-4800 SS (50%):
offwht-med gy, w srted, vf-f
gr, sft-fri, sl hd, cons wi
arg cmt, sl-mod calc;
SLTST (30%): med gy-lt
gy, slty tex, blkly-sb plty,
frm-v frm, tr micmica, non
calc; SH (20%): med
gy-dk gy, sl frm-sft, sl sm
tex, blkly-sb plty, micmica,
non calc





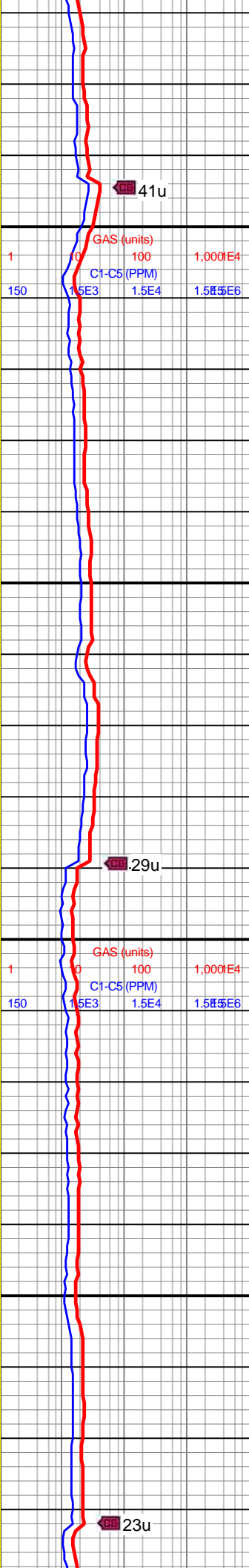
MW IN: 9.7+
VIS IN: 51
MW OUT: 9.8
VIS OUT: 47

MD: 4,917'
INC: 5.1°
AZM: 280.16°
TVD: 4,902'
VS: -263.84'

WOB: 33.5klbs
RPM: 60
SPM: 201
SPP: 4,430psi

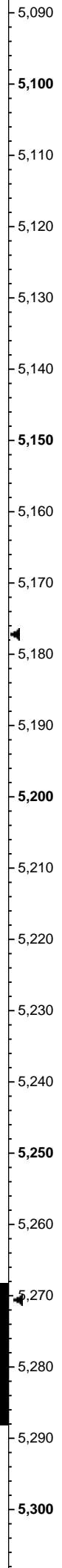
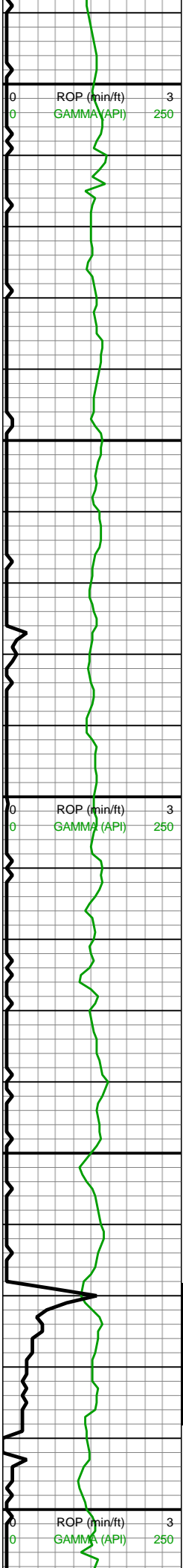
MD: 5,012'
INC: 4.04°
AZM: 288.78°
TVD: 4,996.7'
VS: -271.03'

Shannon
5,081'MD/5,066'TVD



4800-5000 SS (60%):
offwht-med gy, w srted, vf-f
gr, sft-fri, sl hd, cons wi
arg cmt, sl-mod calc;
SLTST (20%): med gy-lt
gy, slty tex, blk-y-sb plty,
frm-v frm, tr micmica, non
calc; SH (20%): med
gy-dk gy, sl frm-sft, sl sm
tex, blk-y-sb plty, micmica,
non calc





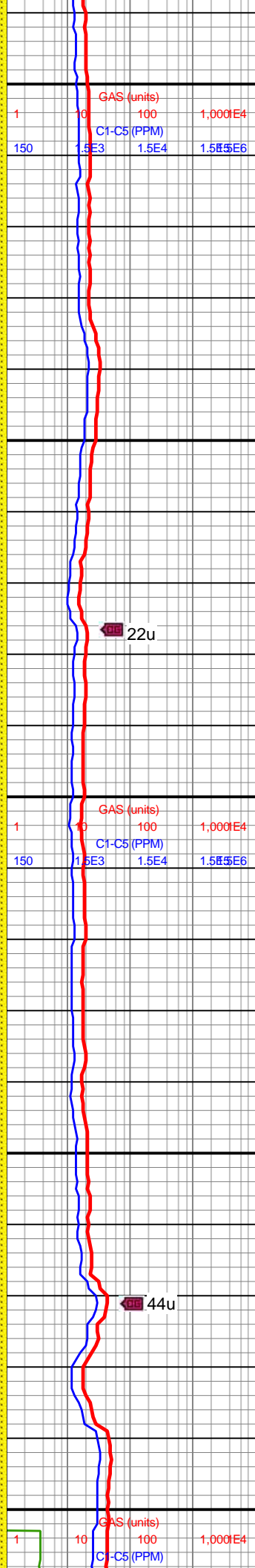
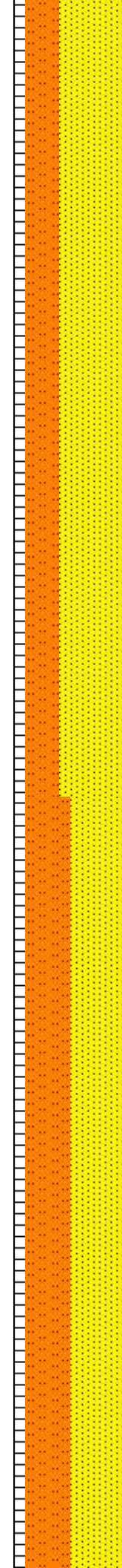
MD: 5,107'
INC: 3.47°
AZM: 282.18°
TVD: 5,091.49'
VS: -276.88'

MD: 5,202'
INC: 2.81°
AZM: 258.98°
TVD: 5,186.35'
VS: -281.95'

WOB: 30.6klbs
RPM: 60
SPM: 200
SPP: 4,470psi

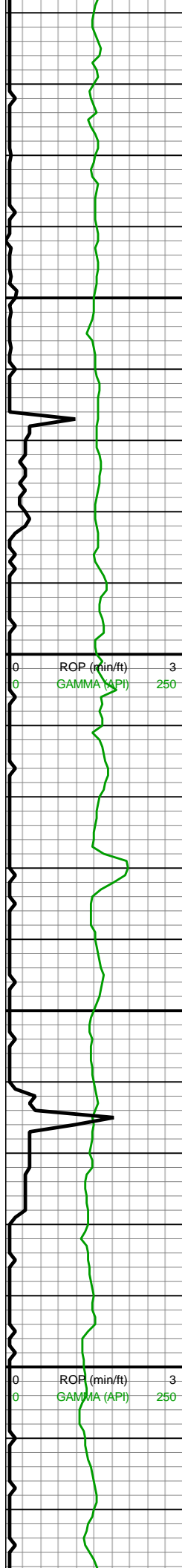
MW IN: 9.7+
VIS IN: 50
MW OUT: 9.7+
VIS OUT: 47

MD: 5,296'
INC: 4.66°
AZM: 273.66°
TVD: 5,280.15'
VS: -288.02'



5000-5200 SS (60%):
offwht-med gy, w srted, vf-f
gr, sft-fri, sl hd, cons wi
arg cmt, sl-mod calc;
SLTST (30%): med gy-lt
gy, slty tex, blk-y-sb plty,
frm-v frm, tr micmica, non
calc; SH (10%): med
gy-dk gy, sl frm-sft, sl sm
tex, blk-y-sb plty, micmica,
non calc



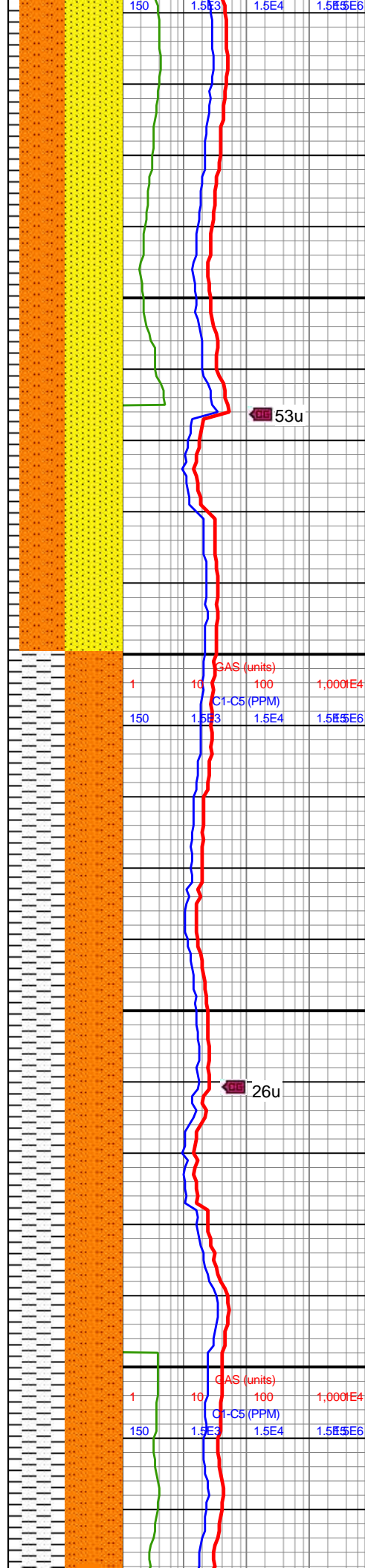


MD: 5,390'
INC: 4.61°
AZM: 288.69°
TVD: 5,373.85'
VS: -295.3'

WOB: 28.5klbs
RPM: 60
SPM: 200
SPP: 4,480psi

MD: 5,484'
INC: 5.49°
AZM: 297.39°
TVD: 5,467.48'
VS: -302.63'

MIN DEPT 10/17/2018

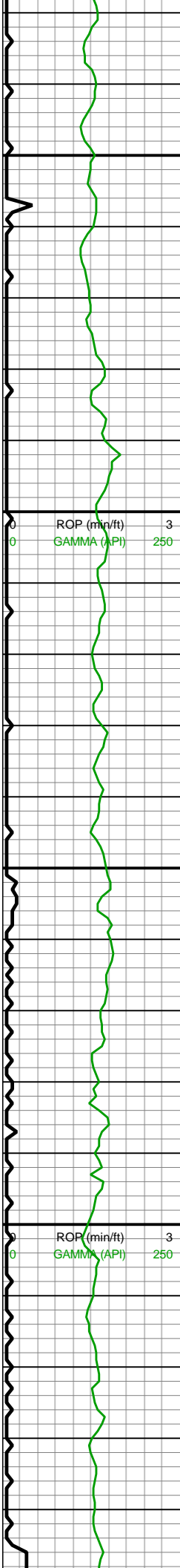


53u

26u

5000-5200 SS (50%):
offwht-med gy, w srtd, vf-f
gr, sft-fri, sl hd, cons wi
arg cmt, sl-mod calc;
SLTST (40%): med gy-lt
gy, slty tex, blk-y-sb plty,
frm-v frm, non calc; SH
(10%): med gy-dk gy, sl
frm-sft, sl sm tex, blk-y-sb
plty, micmica, non calc





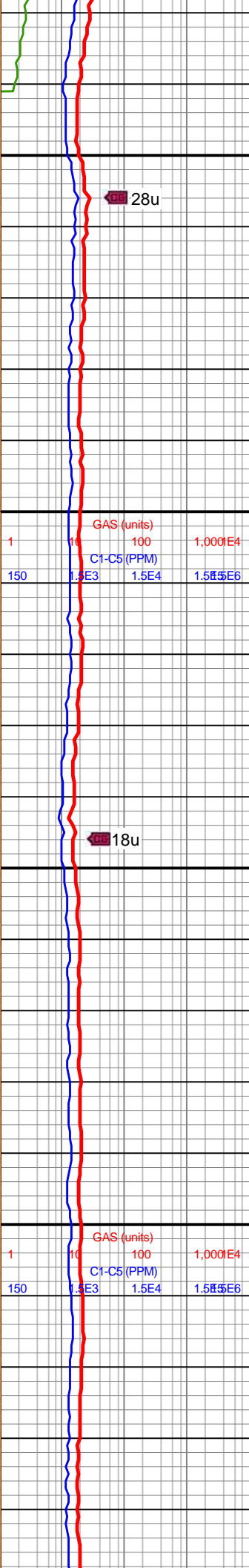
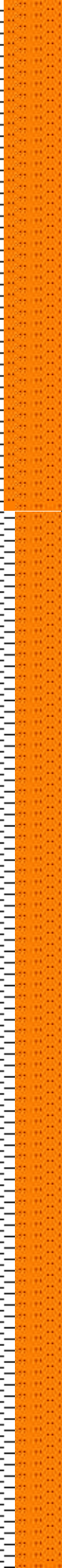
5,530
5,540
5,550
5,560
5,570
5,580
5,590
5,600
5,610
5,620
5,630
5,640
5,650
5,660
5,670
5,680
5,690
5,700
5,710
5,720
5,730
5,740

MD: 5,578'
INC: 5.1°
AZM: 294.58°
TVD: 5,561.08'
VS: -310.15'

WOB: 27.8klbs
RPM: 60
SPM: 200
SPP: 4,545psi

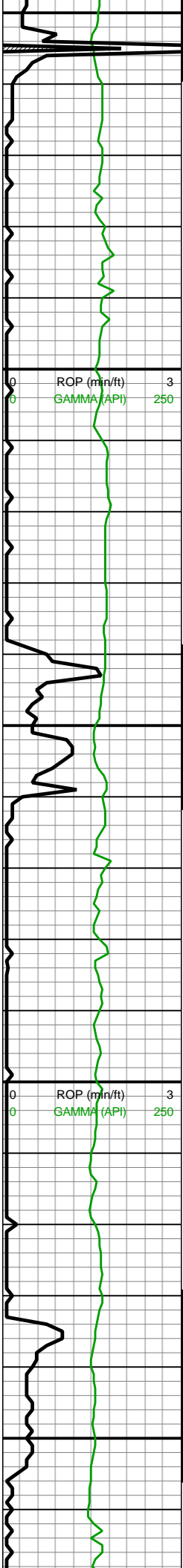
MW IN: 9.7
VIS IN: 50
MW OUT: 9.8
VIS OUT: 47

MD: 5,673'
INC: 4.44°
AZM: 293.35°
TVD: 5,655.75'
VS: -317.13'



5400-5600 SLTY SH
(50%): gyshbn-med gy,
mot lt gy, frm-v frm, sb
blky-tab, slty-rgh tex,
micmica; SLTST (50%):
dk gy-med gy, tab-blky,
frm-sl hrd, rgh-slt tex, v
wk calc





MD: 5,767'
INC: 3.47°
AZM: 290.27°
TVD: 5,749.53'
VS: -322.97'

WOB: 32.2klbs
RPM: 60
SPM: 201
SPP: 4,445psi

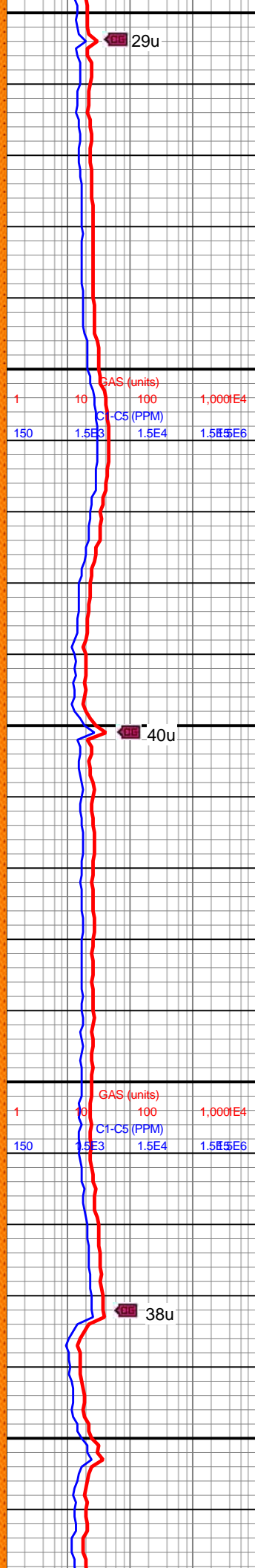
MW IN: 9.7
VIS IN: 51
MW OUT: 9.7
VIS OUT: 47

MD: 5,862'
INC: 3.34°
AZM: 305.12°
TVD: 5,844.36'
VS: -327.74'

MD: 5,956'
INC: 5.01°
AZM: 327.62°
TVD: 5,938.12'
VS: -331.83'

ROP (min/ft) 3
GAMMA (API) 250

ROP (min/ft) 3
GAMMA (API) 250



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

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

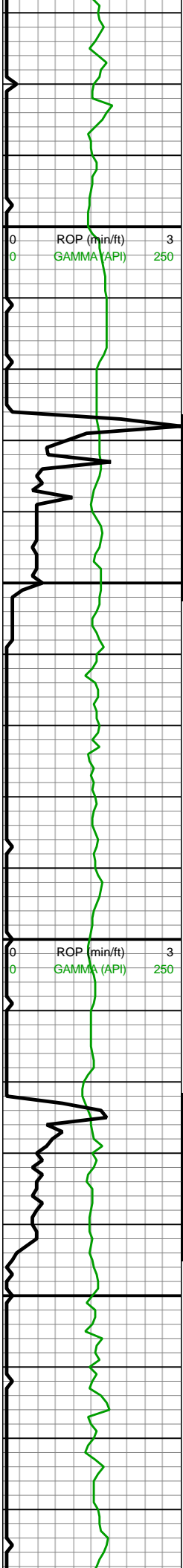
5600-5800 SLTY SH
(60%): gyshbn-med gy,
mot lt gy, frm-v frm, sb
blky-tab, slty-rgh tex,
micmica; SLTST (40%):
dk gy-med gy, tab-blky,
frm-sl hrd, rgh-slty tex, v
wk calc



29u

40u

38u

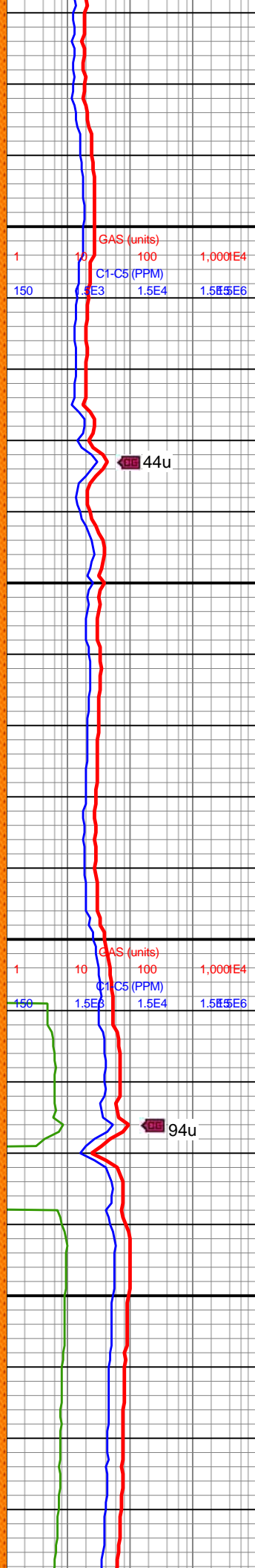


WOB: 31.5klbs
RPM: 60
SPM: 201
SPP: 4,520psi

MW IN: 9.7
VIS IN: 50
MW OUT: 9.7+
VIS OUT: 47

MD: 6,050'
INC: 6.5°
AZM: 325.16°
TVD: 6,031.64'
VS: -336.53'

MD: 6,145'
INC: 7.43°
AZM: 315.85°
TVD: 6,125.94'
VS: -343.27'

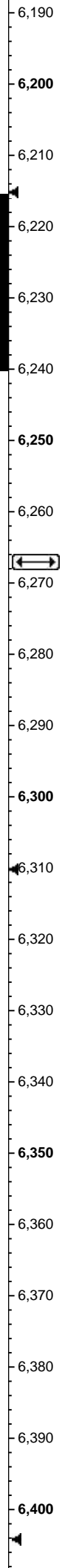
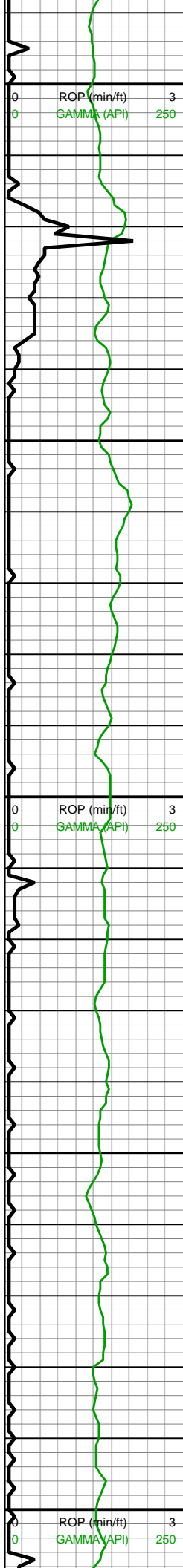


5800-6000 SLTY SH
(50%): lt gy-med gy-dk gy,
frm-v frm, sb blk-ly-tab,
sly-rgh tex, micmica;
SLTST (50%): dk gy-med
gy, tab-blky, frm-sl hrd,
rgh-sly tex, v wk calc



6000-6200 SLTY SH
(50%): lt gy-med gy-dk gy,
frm-v frm, sb blk-ly-tab,
sly-rgh tex, micmica,





WOB: 29.7klbs
RPM: 60
SPM: 201
SPP: 4,675psi

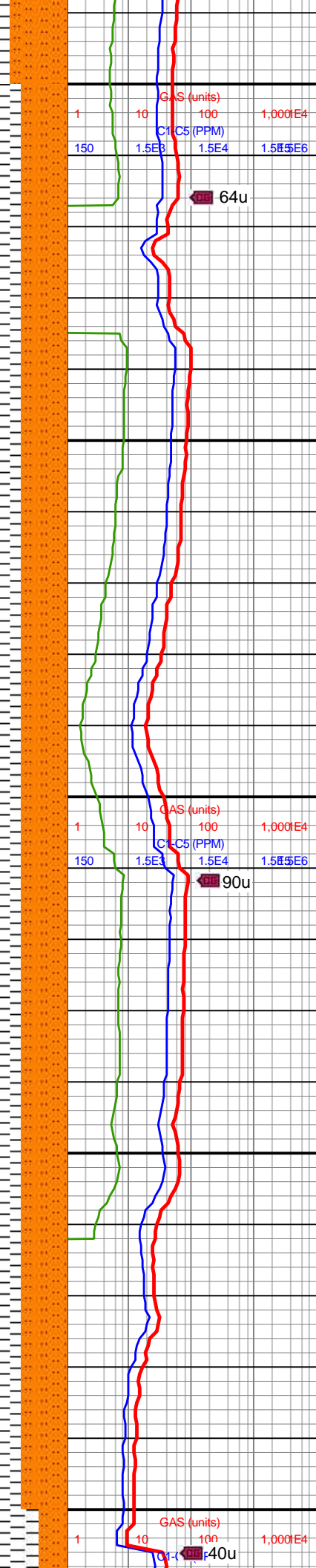
MW IN: 9.8+
VIS IN: 51
MW OUT: 9.8+
VIS OUT: 48

MD: 6,240'
INC: 6.9°
AZM: 296.07°
TVD: 6,220.21'
VS: -352.19'

Tepee Buttes
6,267'MD/6,247'TVD

MD: 6,334'
INC: 5.27°
AZM: 293.87°
TVD: 6,313.68'
VS: -360.9'

WOB: 22.3klbs
RPM: 60
SPM: 202
SPP: 4,790psi



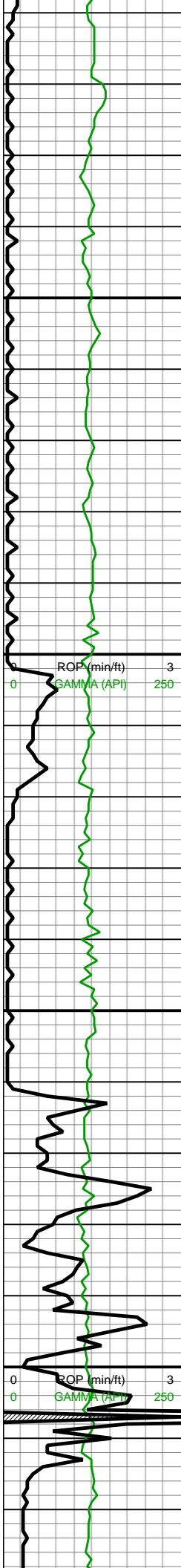
64u

90u

40u

sme calc; SLTST (50%):
dk gy-med gy, tab-blky,
frm-sl hrd, rgh-sltly tex,
calc

6200-6400 SLTY SH
(60%): gyshbn-med gy,
mot lt gy, frm-v frm, sb
blky-tab, slty-sl sm tex,
micmica; SLTST (40%):
dk gy-med gy, tab-blky,
frm-sl hrd, rgh-sltly tex, v
wk calc



MD: 6,429'
INC: 3.69°
AZM: 293.08°
TVD: 6,408.39'
VS: -367.49'

MD: 6,523'
INC: 3.03°
AZM: 321.12°
TVD: 6,502.23'
VS: -371.61'

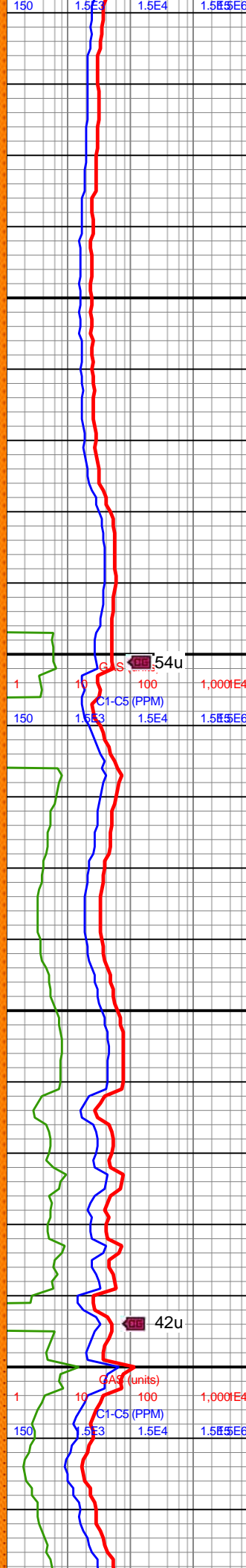
KOP @ 6,558'
MD

MD: 6,570'
INC: 4°
AZM: 330°
TVD: 6,549.14'
VS: -373.05'

MW IN: 10
VIS IN: 52
MW OUT: 10.0+
VIS OUT: 47

WOB: 7.1klbs
RPM: 0
SPM: 170
SPP: 3,058psi

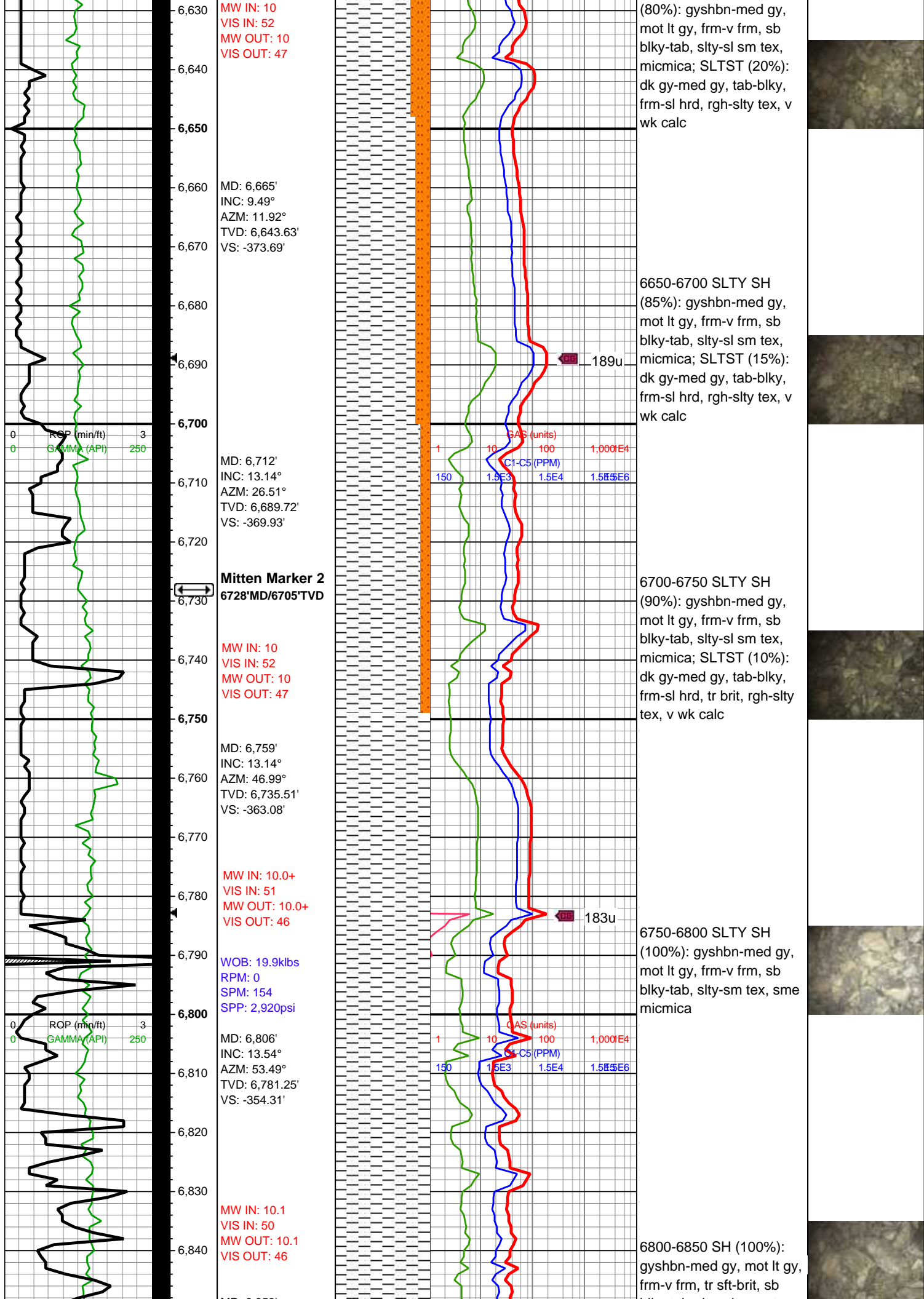
MD: 6,618'
INC: 4.88°
AZM: 342.48°
TVD: 6,597'
VS: -374.27'

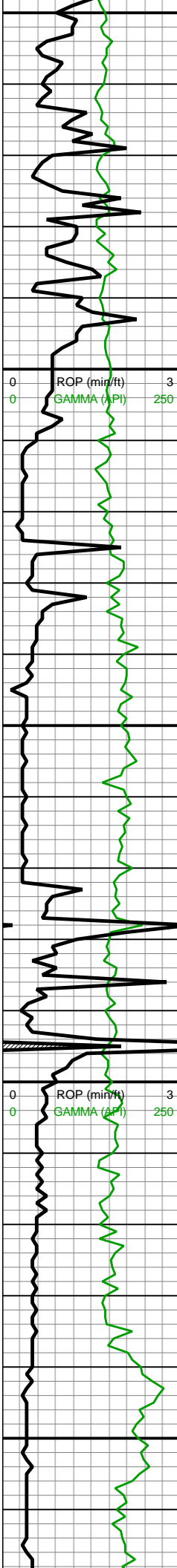


6400-6600 SLTY SH
(75%): gyshbn-med gy,
mot lt gy, frm-v frm, sb
blky-tab, slty-sl sm tex,
micmica; SLTST (25%):
dk gy-med gy, tab-blky,
frm-sl hrd, rgh-slty tex, v
wk calc



6600-6650 SLTY SH





MD: 6,853'
INC: 13.76°
AZM: 54.37°
TVD: 6,826.92'
VS: -344.92'

MW IN: 10.1
VIS IN: 49
MW OUT: 10.1
VIS OUT: 46

MD: 6,901'
INC: 12.7°
AZM: 69.66°
TVD: 6,873.66'
VS: -335.01'

MW IN: 10.1+
VIS IN: 47
MW OUT: 10.1
VIS OUT: 45

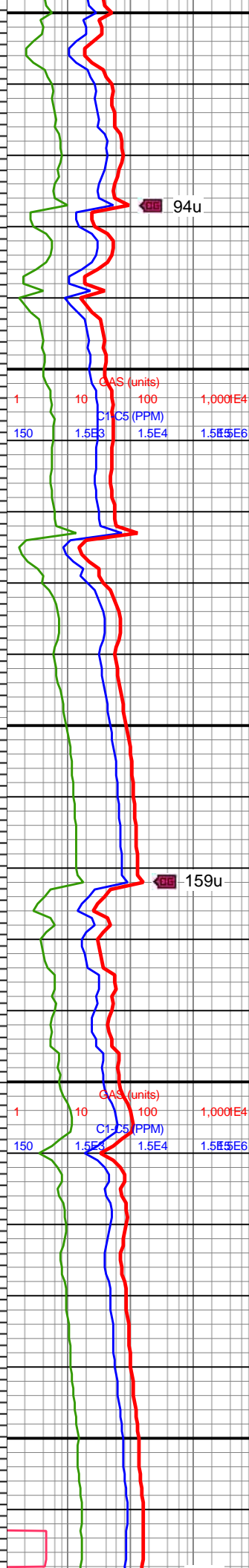
MD: 6,996'
INC: 16.48°
AZM: 96.29°
TVD: 6,965.68'
VS: -311.69'

WOB: 9.2klbs
RPM: 0
SPM: 130
SPP: 1,970psi

MD: 7,043'
INC: 21.31°
AZM: 107.11°
TVD: 7,010.15'
VS: -297.14'

Sharon Springs
7,040'MD/7,007'TVD

MW IN: 10.2
VIS IN: 48



94u

159u

blky-tab-plty, slty-sm tex

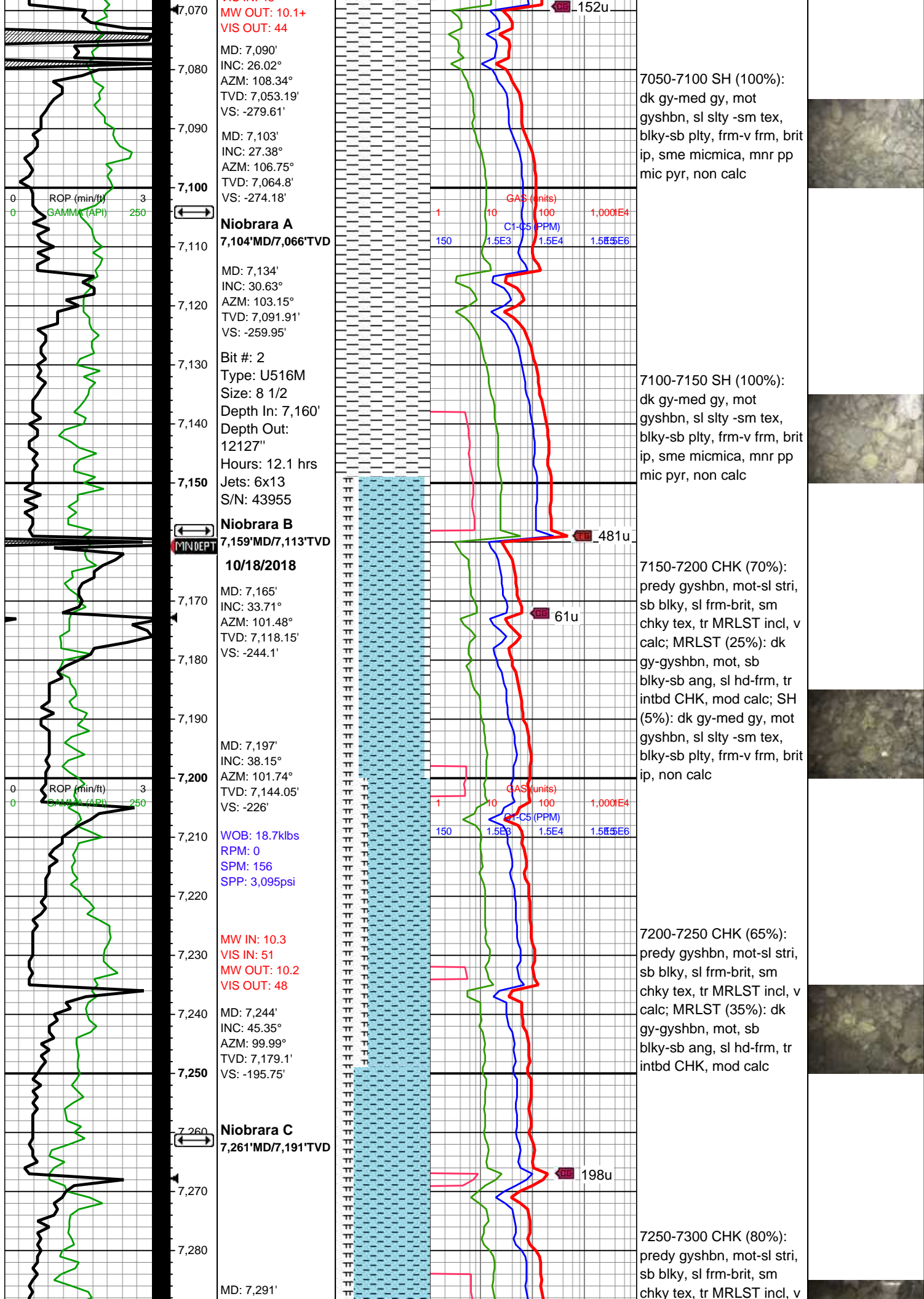
6850-6900 SH (100%):
gyshbn-med gy, mot lt gy,
frm-v frm, tr sft-brit, sb
blky-tab-plty, slty-sm tex

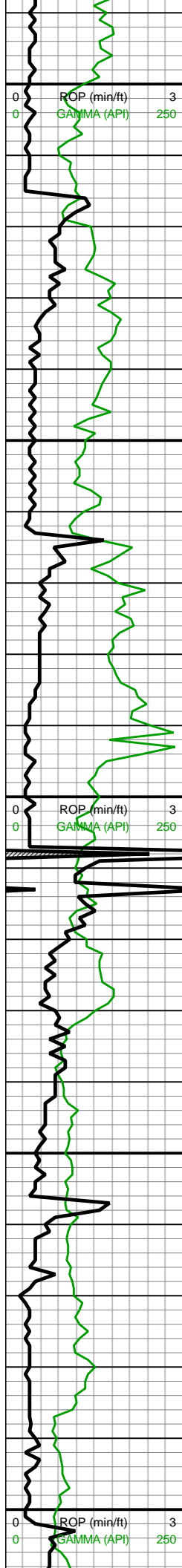
6900-6950 SH (100%):
med gy, mot lt gy, frm-v
frm, tr sft-brit, sb
blky-tab-plty, slty-sm tex

6950-7000 SH (100%):
med gy, mot lt gy, frm-v
frm, tr sft-brit, sb
blky-tab-plty, sm- sl slty
tex

7000-7050 SH (100%):
med gy, mot lt gy, frm-v
frm, tr sft-brit, sb
blky-tab-plty, sm- sl slty
tex







INC: 52.03°
AZM: 97.88°
TVD: 7,210.11'
VS: -161.34'

MW IN: 10.3
VIS IN: 51
MW OUT: 10.2
VIS OUT: 47

MD: 7,338'
INC: 58.89°
AZM: 95.24°
TVD: 7,236.74'
VS: -123.28'

Niobrara D
7,395'MD/7,263'TVD

WOB: 44.9klbs
RPM: 0
SPM: 156
SPP: 3,363psi

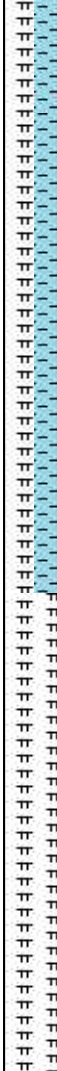
MD: 7,432'
INC: 71.76°
AZM: 90.41°
TVD: 7,275.79'
VS: -38.53'

MINDEPTH 10/19/2018

MW IN: 10.4+
VIS IN: 58
MW OUT: 10.4+
VIS OUT: 50

MD: 7,480'
INC: 77.92°
AZM: 88.03°
TVD: 7,288.34'
VS: 7.71'

MW IN: 10.3
VIS IN: 53



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

411u

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

418u

130u

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

calc; MRLST (20%): dk
gy-gyshbn, mot, sb
blky-sb ang, sl hd-frm, tr
intbd CHK, mod calc

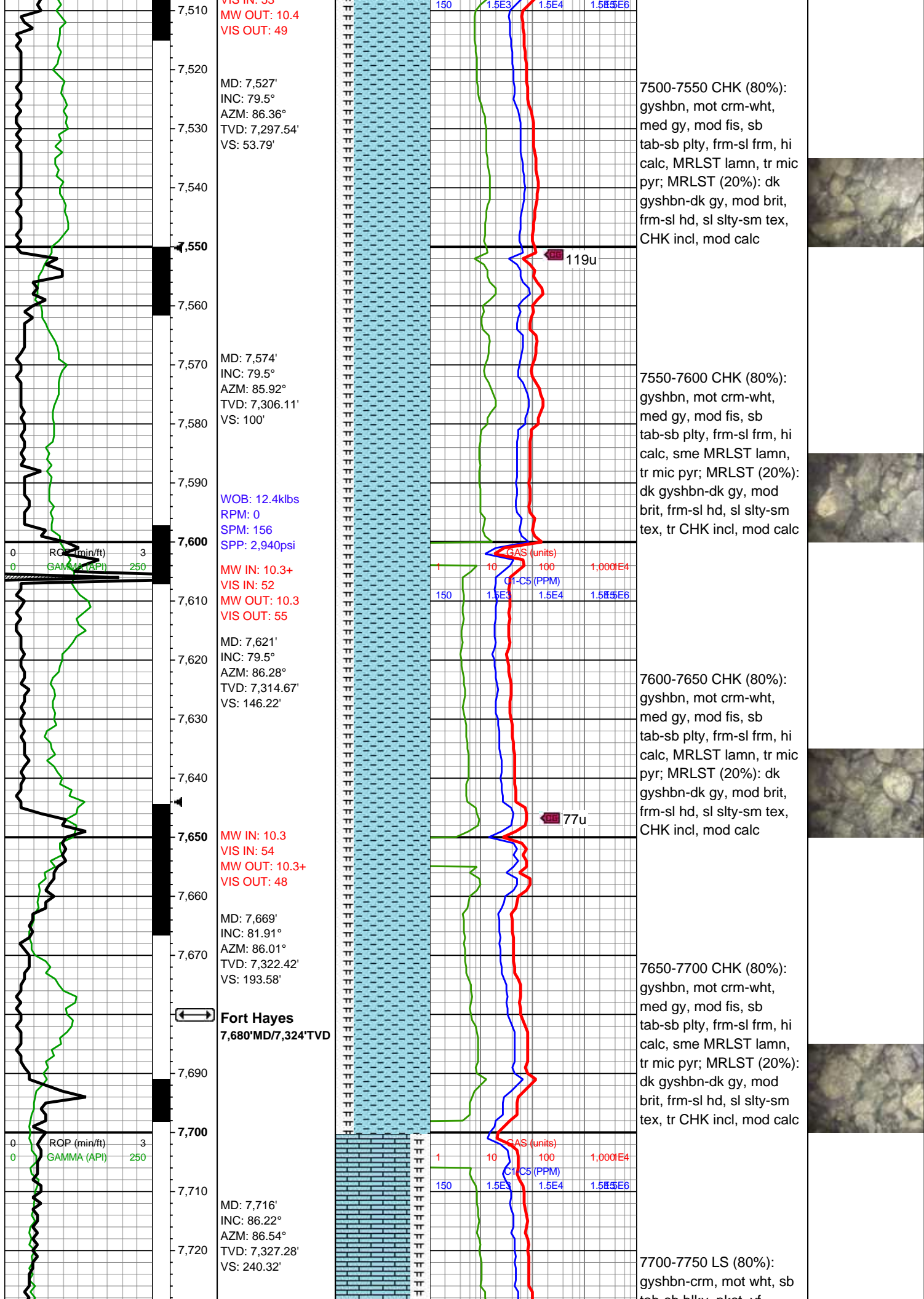
7300-7350 CHK (80%):
predy gyshbn, mot-sl stri,
sb blky, sl frm-brit, sm
chky tex, tr MRLST incl, v
calc; MRLST (20%): dk
gy-gyshbn, mot, sb
blky-sb ang, sl hd-frm, tr
intbd CHK, mod calc

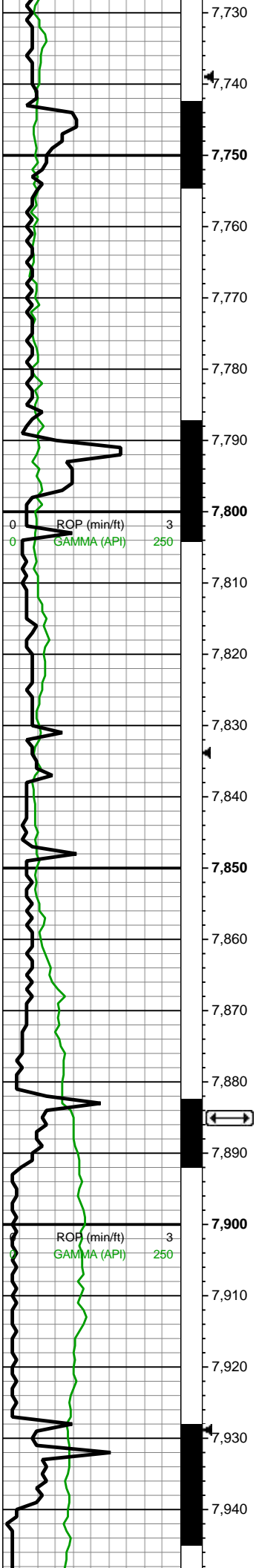
7350-7400 CHK (65%):
predy gyshbn, mot-sl stri,
sb blky, sl frm-brit, sm
chky tex, tr MRLST incl, v
calc; MRLST (35%): dk
gy-gyshbn, mot, sb
blky-sb ang, sl hd-frm, tr
intbd CHK, mod calc

7400-7450 CHK (80%):
gyshbn, mot crm-wht,
med gy, mod fis, sb
tab-sb plty, frm-sl frm, hi
calc, sme MRLST lamn,
tr mic pyr; MRLST (20%):
dk gyshbn-dk gy, mod
brit, frm-sl hd, sl slty-sm
tex, tr CHK incl, mod calc

7450-7500 CHK (80%):
gyshbn, mot crm-wht,
med gy, mod fis, sb
tab-sb plty, frm-sl frm, hi
calc, sme MRLST lamn,
tr mic pyr; MRLST (20%):
dk gyshbn-dk gy, mod
brit, frm-sl hd, sl slty-sm
tex, tr CHK incl, mod calc







MW IN: 10.3
VIS IN: 52
MW OUT: 10.3
VIS OUT: 48

MD: 7,764'
INC: 88.77°
AZM: 87.51°
TVD: 7,329.38'
VS: 288.26'

Land Curve @
7796' MD

WOB: 25.2klbs
RPM: 25
SPM: 154
SPP: 3,345psi

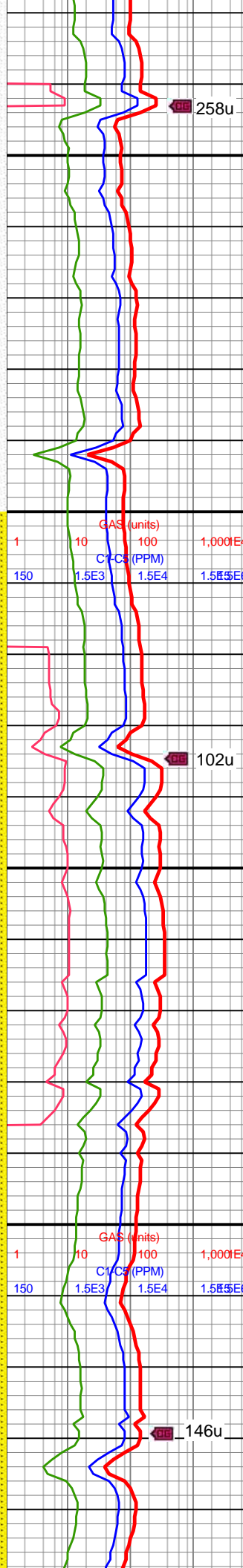
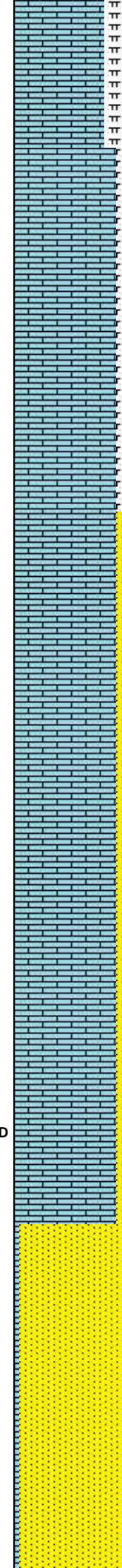
MW IN: 10.3
VIS IN: 51
MW OUT: 10.3
VIS OUT: 47

MD: 7,858'
INC: 90.7°
AZM: 88.21°
TVD: 7,329.82'
VS: 382.22'

Codell
7,885'MD/7,330'TVD

ROP (min/ft)
GAMMA (API)

MD: 7,952'



258u

102u

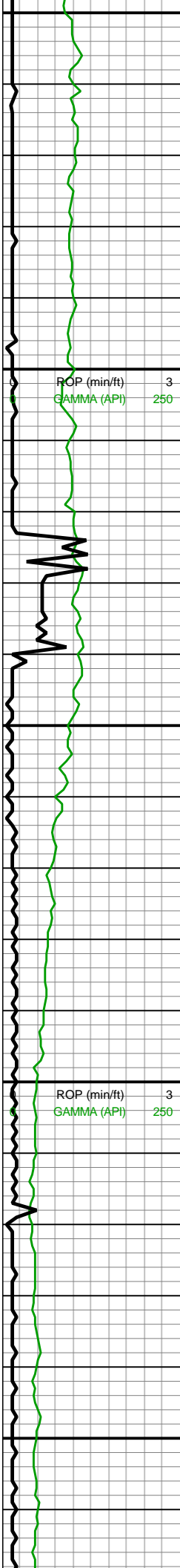
146u

tab-sb blk, pkst, vi
xln-micxln, frm-sl frm, tr
pp/imbd mic pyr cls, hi
calc; (20%): dk
gyshbn-dk gy, mod brit,
frm-sl hd, sl slty-sm tex, tr
CHK incl, mod calc

7750-7800 LS (90%):
gyshbn-crm, mot wht, sb
tab-sb blk, pkst, vf
xln-micxln, frm-sl frm, tr
pp/imbd mic pyr cls, hi
calc; (10%): dk
gyshbn-dk gy, mod brit,
frm-sl hd, sl slty-sm tex, tr
CHK incl, mod calc

7800-7900 LS (90%):
gyshbn-crm, mot wht, sb
tab-sb blk, pkst, vf
xln-micxln, frm-sl frm, tr
pp/imbd mic pyr cls, hi
calc; SS (10%): lt
brn-bnshgy, med brn, sb
rnd-sb ang, vf-f gr, slt ip,
mtx-gr sup cluss, cons wi
silc/arg cmt





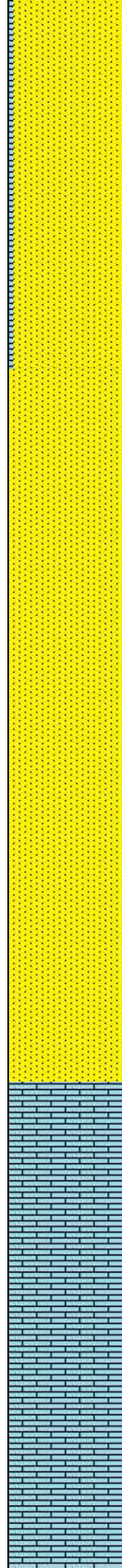
7,950
7,960
7,970
7,980
7,990
8,000
8,010
8,020
8,030
8,040
8,050
8,060
8,070
8,080
8,090
8,100
8,110
8,120
8,130
8,140
8,150
8,160

MD: 7,953
INC: 88.42°
AZM: 88.74°
TVD: 7,330.55'
VS: 477.13'

MW IN: 10.3
VIS IN: 51
MW OUT: 10.3
VIS OUT: 47

MD: 8,047'
INC: 86.48°
AZM: 90.14°
TVD: 7,334.73'
VS: 570.87'

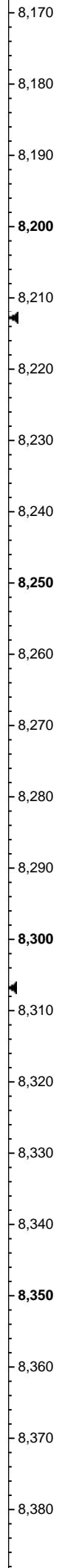
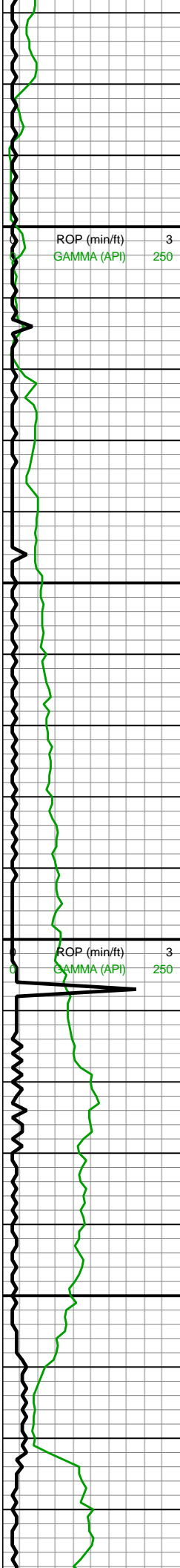
MD: 8,142'
INC: 87.1°
AZM: 90.49°
TVD: 7,340.05'
VS: 665.47'



7900-8000 SS (90%): It
brn-bnshgy, med brn, sb
rnd-sb ang, vf-f gr, slt ip,
mtx-gr sup cluss, cons wi
silc/arg cmt; LS (10%):
gyshbn-crm, mot wht, sb
tab-sb blkly, pkst, vf
xln-micxln, frm-sl frm, hi
calc

8000-8100 SS (100%): It
brn-bnshgy, med brn, sb
rnd-sb ang, vf-f gr, slt ip,
mtx-gr sup cluss, cons wi
silc/arg cmt





WOB: 36.4klbs
RPM: 71
SPM: 202
SPP: 5,469psi

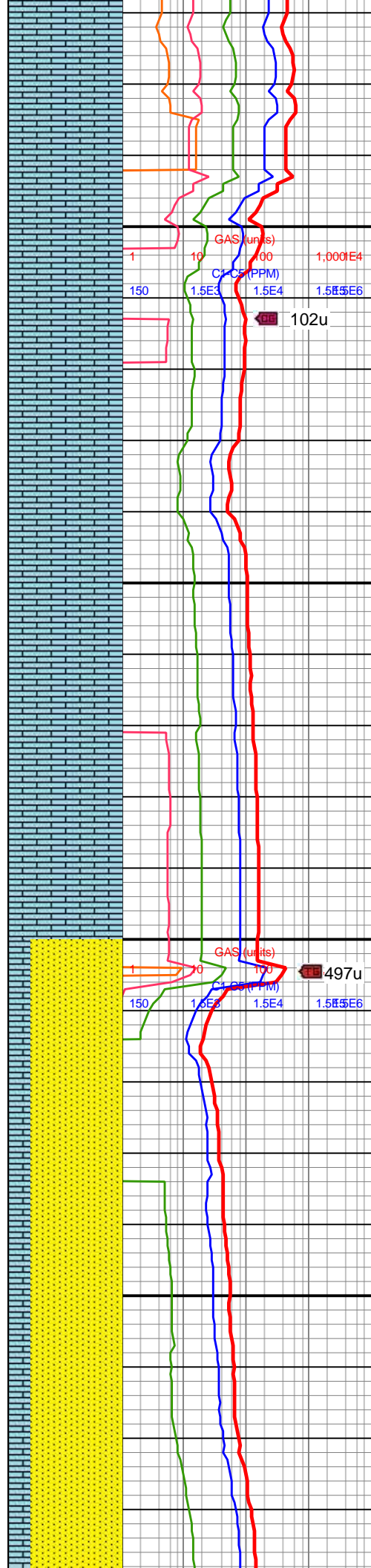
MD: 8,236'
INC: 87.8°
AZM: 89.97°
TVD: 7,344.23'
VS: 759.14'

MW IN: 10.3
VIS IN: 47
MW OUT: 10.3
VIS OUT: 45

MW IN: 10.3
VIS IN: 47
MW OUT: 10.3
VIS OUT: 45

MD: 8,330'
INC: 88.55°
AZM: 90.49°
TVD: 7,347.22'
VS: 852.85'

MW IN: 10.6
VIS IN: 56
MW OUT: 10.5
VIS OUT: 54

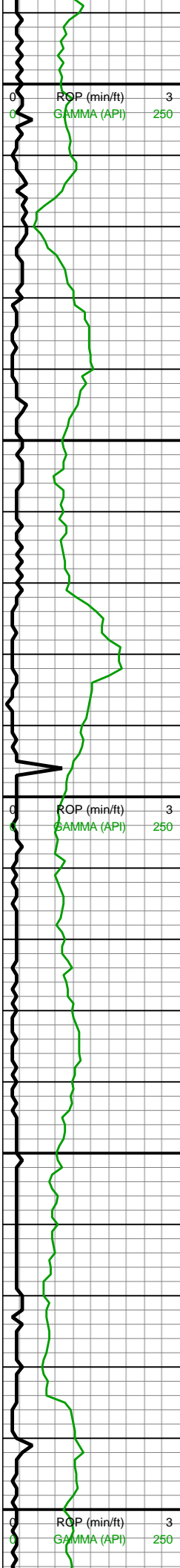


8100-8200 LS (100%):
gyshbn-crm, mot wht, sb
tab-sb blk, pkst, vf
xln-micxln, frm-sl frm, hi
calc

8200-8300 LS (100%):
gyshbn-crm, mot wht, sb
tab-sb blk, pkst, vf
xln-micxln, frm-sl frm, hi
calc

8300-8400 SS (80%): lt
brn-bnshgy, med brn, sb
rnd-sb ang, vf-f gr, slt ip,
mtx-gr sup cluss, cons wi
silc/arg cmt; LS (20%):





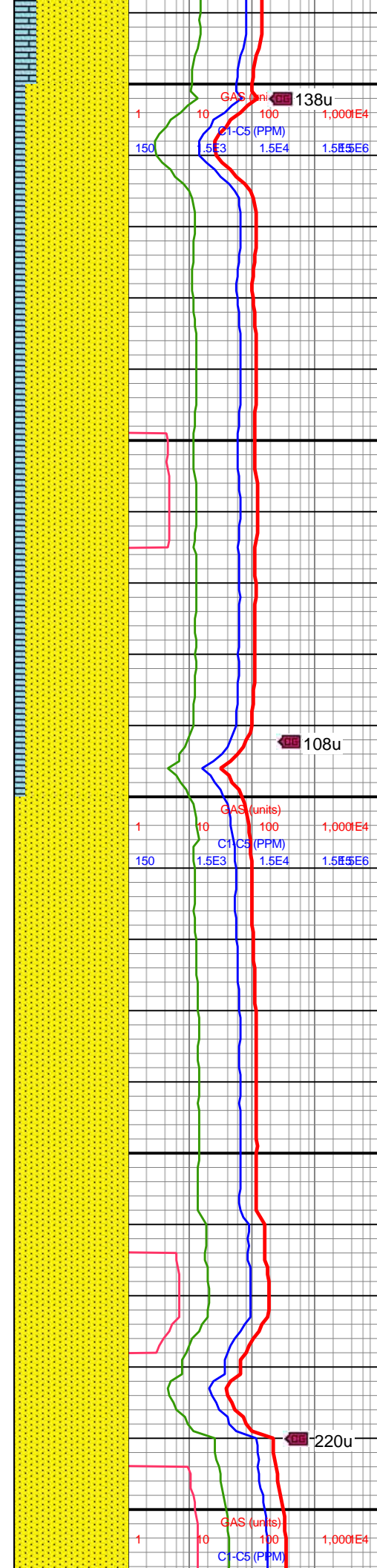
WOB: 34.4klbs
RPM: 71
SPM: 185
SPP: 4,920psi

MD: 8,425'
INC: 89.17°
AZM: 89.88°
TVD: 7,349.11'
VS: 947.59'

MW IN: 10.5
VIS IN: 56
MW OUT: 10.5+
VIS OUT: 50

MD: 8,519'
INC: 89.69°
AZM: 89.7°
TVD: 7,350.05'
VS: 1,041.4'

WOB: 35.3klbs
RPM: 71
SPM: 188
SPP: 5,010psi

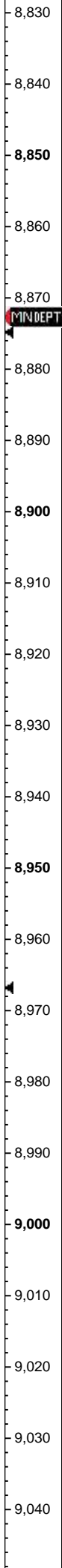
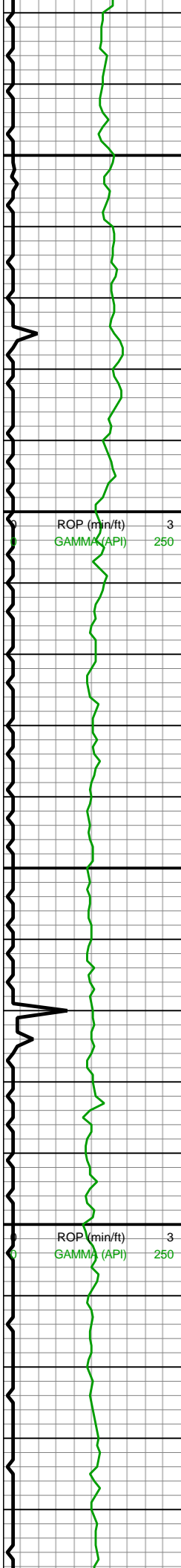


gyshbn-crm, mot wht, sb
tab-sb blk, pkst, vf
xln-micxln, frm-sl frm, hi
calc

8400-8500 SS (90%): lt
brn-bnshgy, med brn, sb
rnd-sb ang, vf-f gr, slt ip,
mtx-gr sup cluss, cons wi
silc/arg cmt; LS (10%):
gyshbn-crm, mot wht, sb
tab-sb blk, pkst, vf
xln-micxln, frm-sl frm, hi
calc

8500-8600 SS (100%): lt
brn-bnshgy, med brn, sb
rnd-sb ang, vf-f gr, slt ip,
mtx-gr sup cluss, cons wi
silc/arg cmt





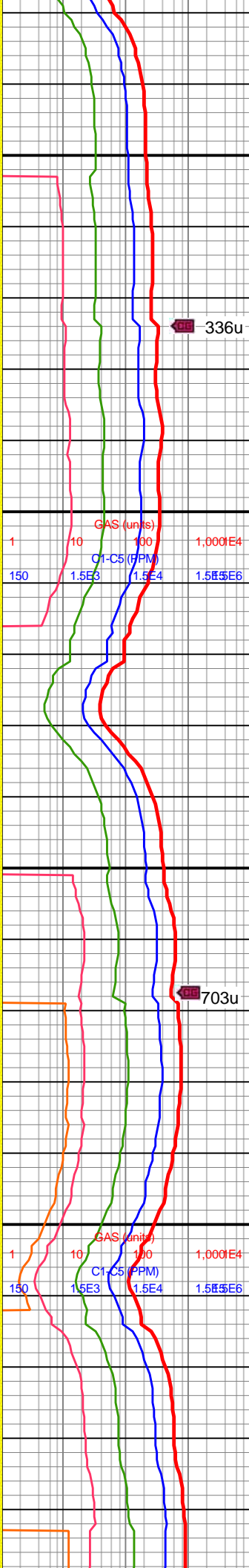
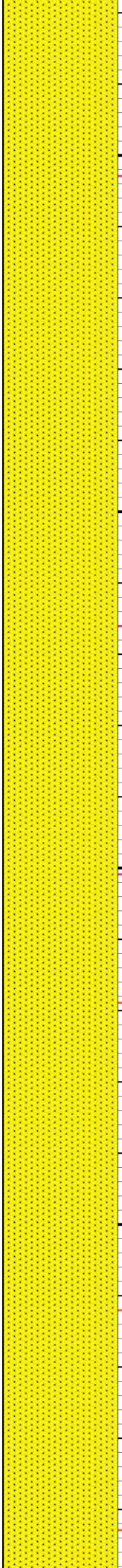
MW IN: 10.4+
VIS IN: 52
MW OUT: 10.5
VIS OUT: 49

10/20/2018

MD: 8,897'
INC: 91.32°
AZM: 89.35°
TVD: 7,346.76'
VS: 1,418.82'

MD: 8,991'
INC: 91.54°
AZM: 89.35°
TVD: 7,344.42'
VS: 1,512.65'

WOB: 33.2klbs
RPM: 71
SPM: 188
SPP: 5,160psi



336u

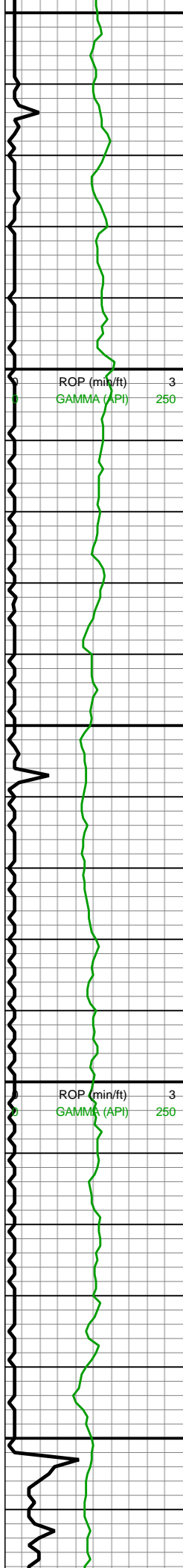
8800-8900 SS (100%):
med brn-bnshgy, lt brn,
gyshbn, sb rnd-sb ang,
vf-sltly gr, mtx-gr sup
cluss, cons wi silc/arg
cmt, tr diss/PP mic pyr,
mod-hi calc



703u

8900-9000 SS (100%):
med brn-bnshgy, lt brn,
gyshbn, sb rnd-sb ang,
vf-sltly gr, mtx-gr sup
cluss, cons wi silc/arg
cmt, tr diss/PP mic pyr,
mod-hi calc





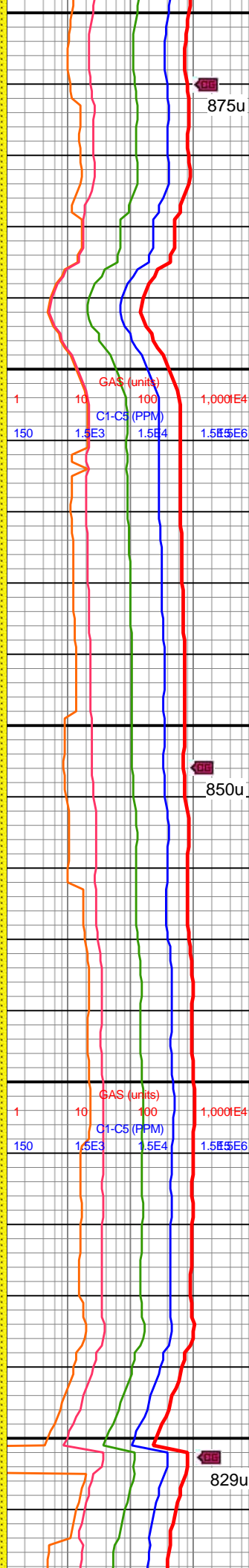
MD: 9,086'
INC: 91.71°
AZM: 88.12°
TVD: 7,341.73'
VS: 1,607.51'

MW IN: 10.4+
VIS IN: 54
MW OUT: 10.6
VIS OUT: 50

MD: 9,180'
INC: 92.2°
AZM: 87.33°
TVD: 7,338.52'
VS: 1,701.42'

WOB: 36.5klbs
RPM: 71
SPM: 187
SPP: 5,125psi

MD: 9,275'



875u

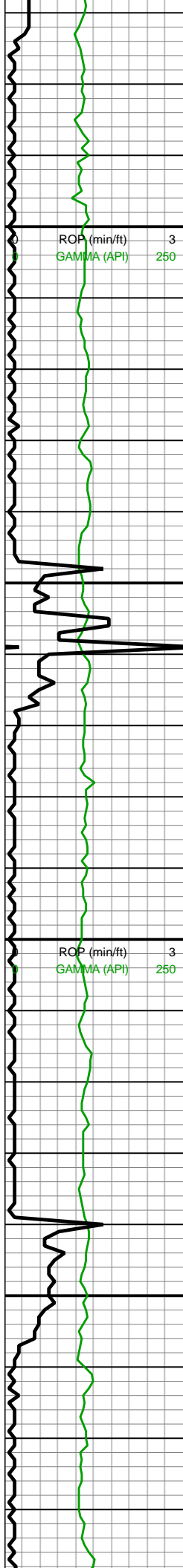
9000-9100 SS (100%):
pred med gyshbn, occ lt
gy-lt brn, sme red-brn,
frm-v frm, blk, pred
mod-w cons gr sup cls
cons wi silc cmt, non
calc, vf-f grnd, occ grdg to
slt

850u

9100-9200 SS (100%):
med brn-bnshgy, lt brn,
gyshbn, sb rnd-sb ang,
vf-slt gr, mtx-gr sup
cluss, cons wi silc/arg
cmt, tr diss/pp mic pyr,
mod-hi calc

829u





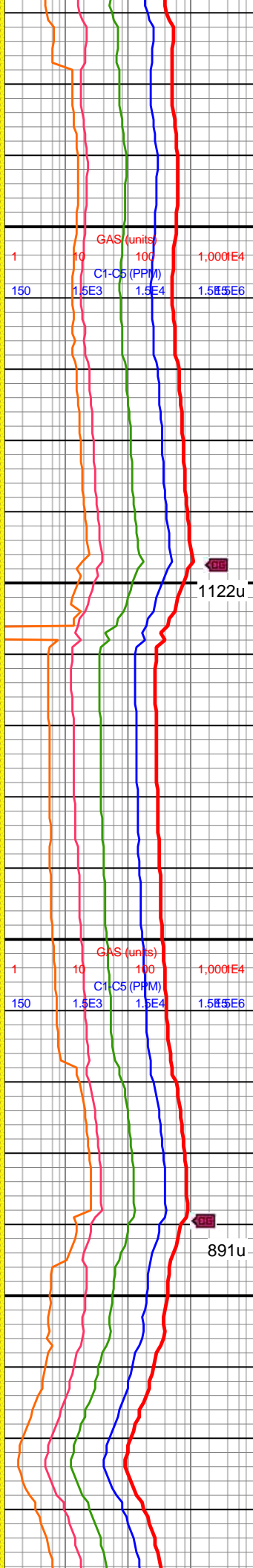
MD: 9,273'
INC: 91.1°
AZM: 89.35°
TVD: 7,335.78'
VS: 1,796.3'

MD: 9,369'
INC: 90.7°
AZM: 90.58°
TVD: 7,334.31'
VS: 1,890.08'

WOB: 30.6klbs
RPM: 71
SPM: 188
SPP: 5,145psi

MW IN: 10.4
VIS IN: 52
MW OUT: 10.5
VIS OUT: 48

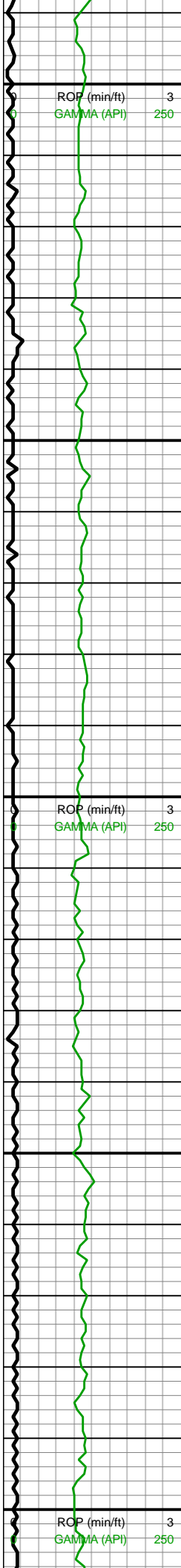
MD: 9,464'
INC: 91.14°
AZM: 92.6°
TVD: 7,332.78'
VS: 1,984.63'



9200-9300 SS (100%):
med brn-bnshgy, lt brn,
gyshbn, sb rnd-sb ang,
vf-sltgy gr, mtx-gr sup
cluss, cons wi silc/arg
cmt, tr dissim/pp mic pyr,
mod-hi calc

9300-9400 SS (100%):
med brn-bnshgy, lt brn,
gyshbn, sb rnd-sb ang,
vf-sltgy gr, mtx-gr sup
cluss, cons wi silc/arg
cmt, tr dissim/pp mic pyr,
mod calc

9400-9500 SS (100%):
med brn-bnshgy, lt brn,
gyshbn, sb rnd-sb ang,

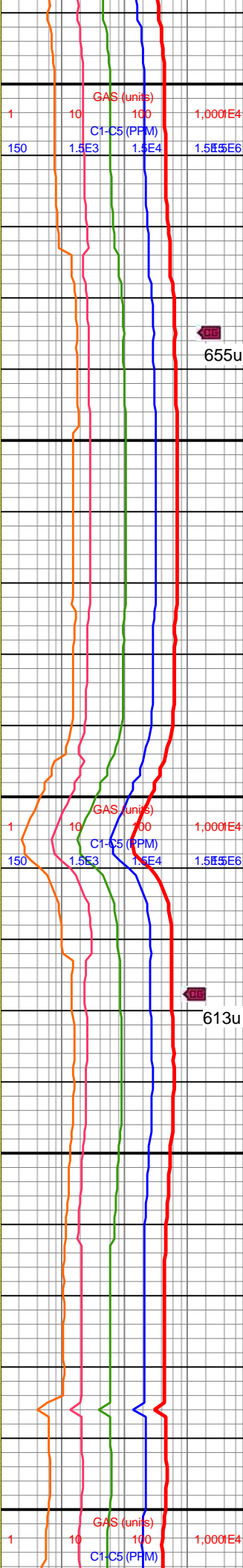
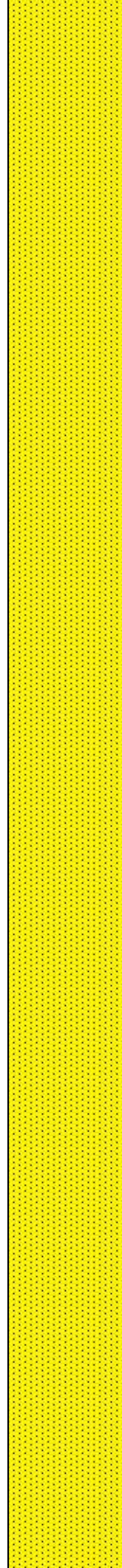


9,490
9,500
9,510
9,520
9,530
9,540
9,550
9,560
9,570
9,580
9,590
9,600
9,610
9,620
9,630
9,640
9,650
9,660
9,670
9,680
9,690
9,700

MD: 9,558'
INC: 91.36°
AZM: 92.43°
TVD: 7,330.73'
VS: 2,078.03'

WOB: 2.8klbs
RPM: 71
SPM: 188
SPP: 5,220psi

MD: 9,653'
INC: 91.01°
AZM: 89.79°
TVD: 7,328.76'
VS: 2,172.64'

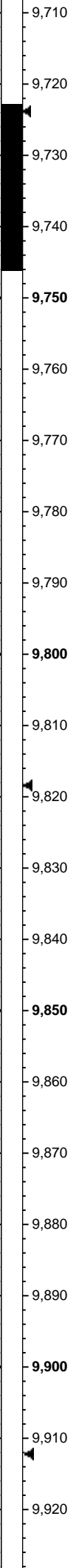
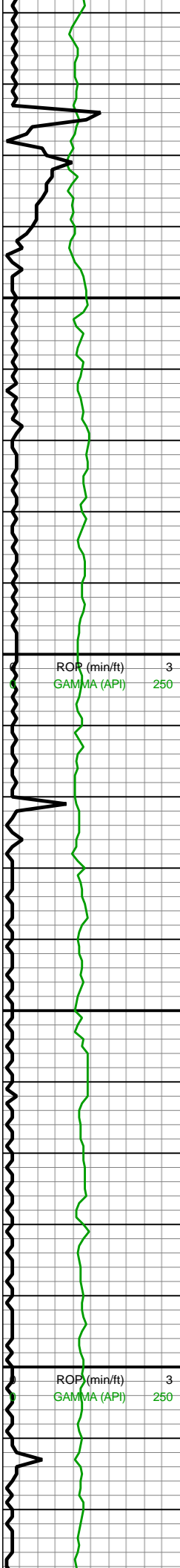


vf-slty gr, mtx-gr sup
cluss, cons wi silc/arg
cmt, tr dissim/pp mic pyr,
mod calc

9500-9600 SS (100%):
med brn-bnshgy, lt brn,
gyshbn, sb rnd-sb ang,
vf-slty gr, mtx-gr sup
cluss, cons wi silc/arg
cmt, tr dissim/pp mic pyr,
mod calc

9600-9700 SS (100%):
med brn-bnshgy, lt brn,
gyshbn, sb rnd-sb ang,
vf-slty gr, mtx-gr sup
cluss, cons wi silc / arg
cmt, dissim mic pyr, mod
calc



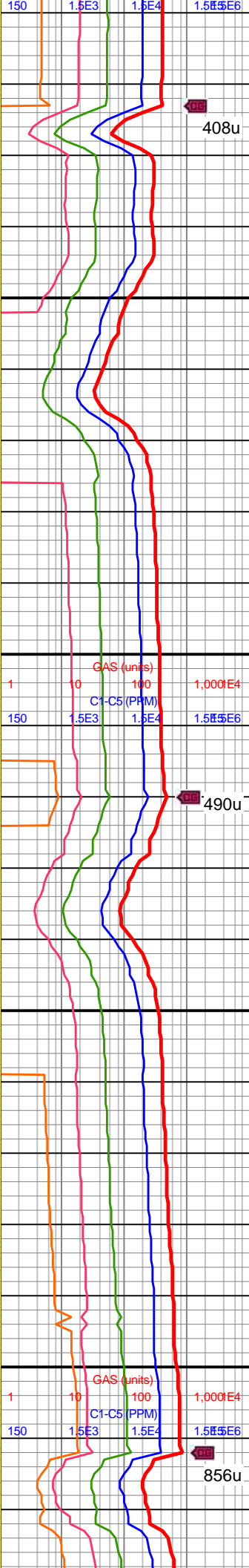
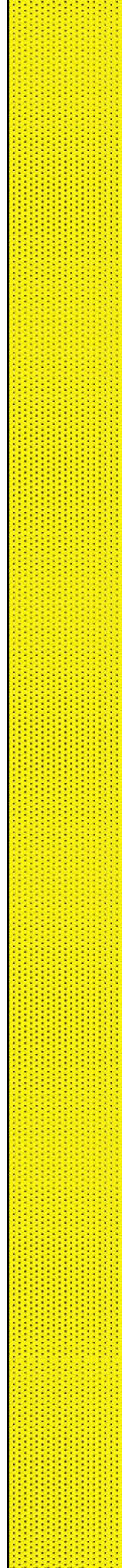


MW IN: 10.4
VIS IN: 54
MW OUT: 10.5
VIS OUT: 49

MD: 9,748'
INC: 90°
AZM: 91.72°
TVD: 7,327.93'
VS: 2,267.32'

WOB: 35.5klbs
RPM: 71
SPM: 186
SPP: 5,100psi

MD: 9,842'
INC: 89.78°
AZM: 90.14°
TVD: 7,328.11'
VS: 2,360.99'



408u

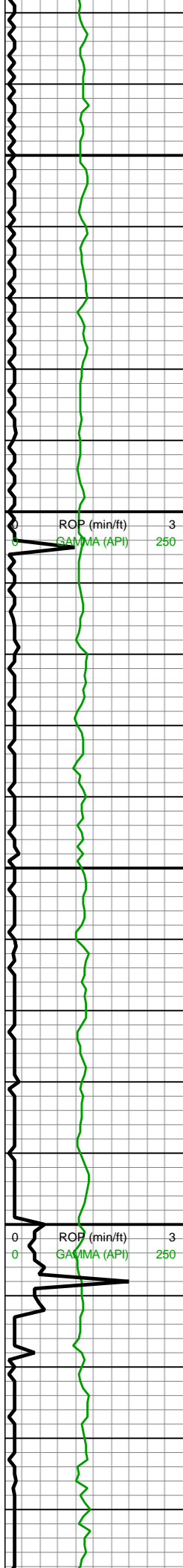
490u

856u

9700-9800 SS (100%):
med brn-bnshgy, lt brn,
gyshbn, sb rnd-sb ang,
vf-slty gr, mtx-gr sup
cluss, cons wi silc / arg
cmt, diss mic pyr, mod
calc

9800-9900 SS (100%):
med brn-bnshgy, lt brn,
gyshbn, sb rnd-sb ang,
vf-slty gr, mtx-gr sup
cluss, cons wi silc / arg
cmt, diss mic pyr, mod
calc





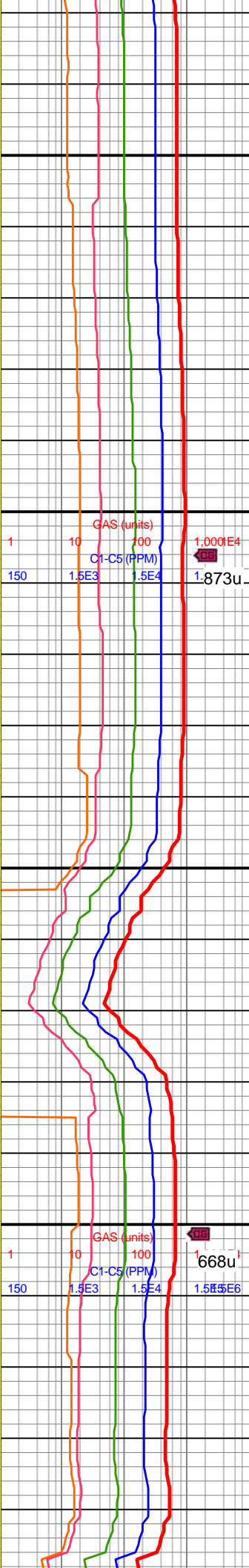
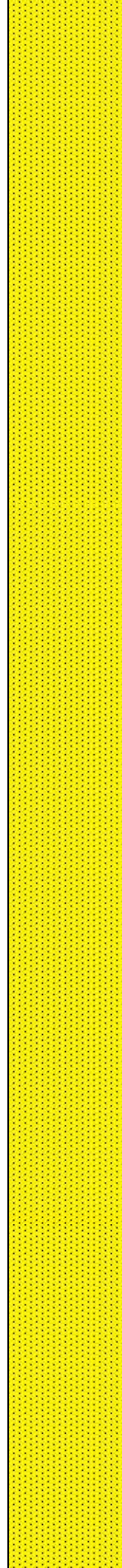
MD: 9,936'
INC: 90.4°
AZM: 90.14°
TVD: 7,327.96'
VS: 2,454.74'

WOB: 37.2klbs
RPM: 71
SPM: 186
SPP: 5,225psi

MW IN: 10.4
VIS IN: 56
MW OUT: 10.5
VIS OUT: 49

MD: 10,031'
INC: 91.36°
AZM: 89.7°
TVD: 7,326.5'
VS: 2,549.52'

MD: 10,125'
INC: 91.19°
AZM: 90.41°
TVD: 7,324.41'
VS: 2,643.27'

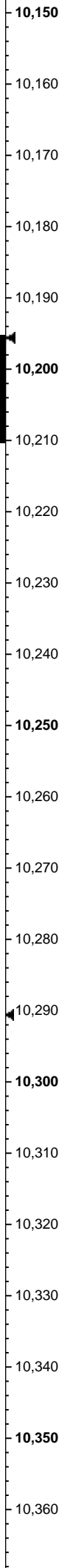
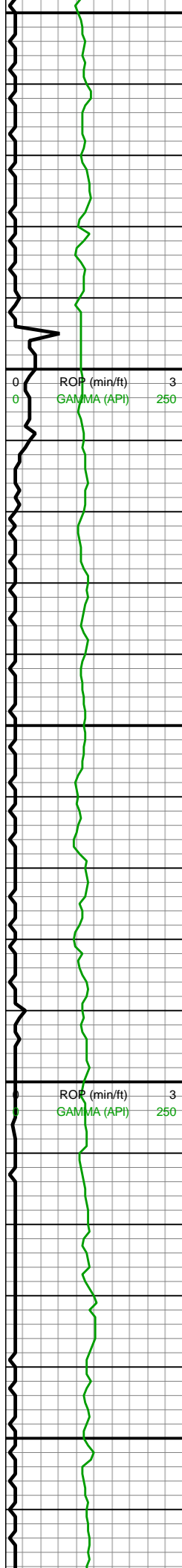


9900-10000 SS (100%):
med brn-bnshgy, lt brn,
gyshbn, sb rnd-sb ang,
vf-slty gr, mtx-gr sup
cluss, cons wi silc / arg
cmt, mod calc



10000-10100 SS (100%):
med brn-bnshgy, lt brn,
gyshbn, sb rnd-sb ang,
vf-slty gr, mtx-gr sup
cluss, cons wi silc / arg
cmt, mod calc



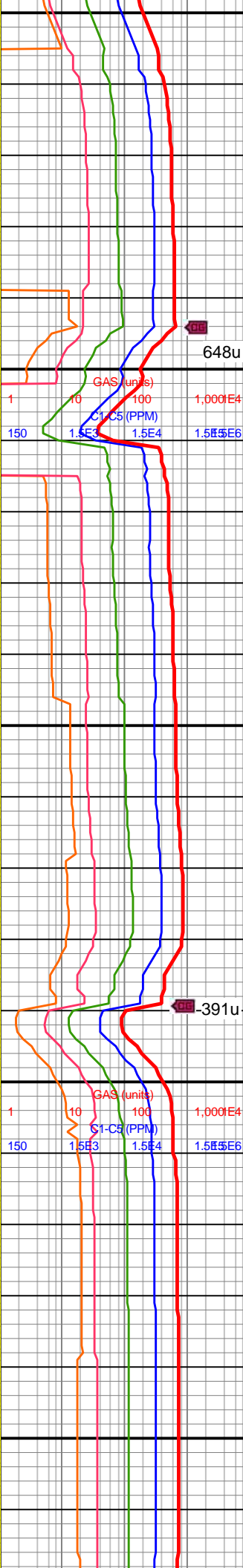
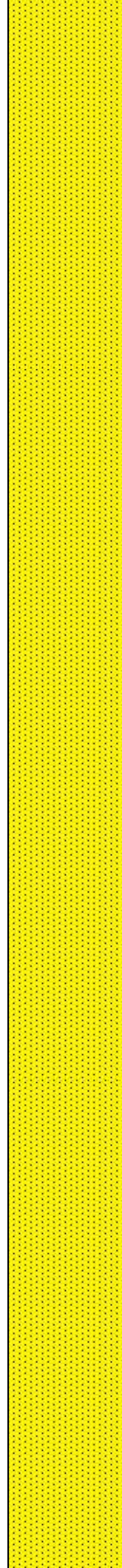


WOB: 47.4klbs
RPM: 13
SPM: 188
SPP: 5,000psi

MD: 10,219'
INC: 89.69°
AZM: 89.97°
TVD: 7,323.69'
VS: 2,737.03'

MD: 10,313'
INC: 90.13°
AZM: 90.32°
TVD: 7,323.84'
VS: 2,830.8'

MW IN: 10.4
VIS IN: 52
MW OUT: 10.4+
VIS OUT: 48

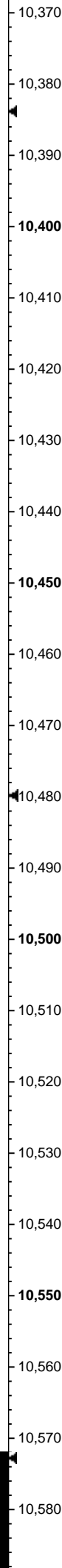
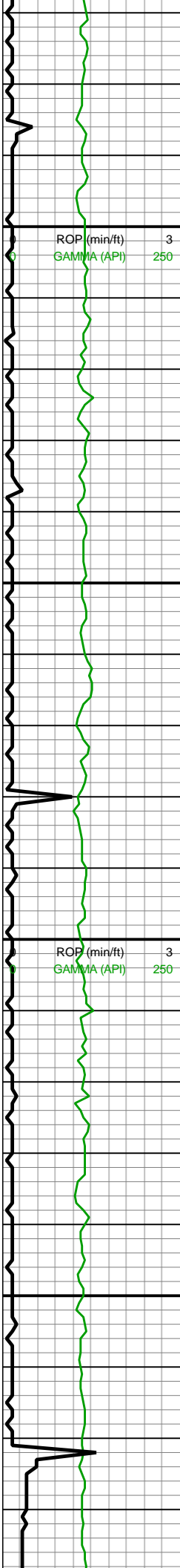


10100-10200 SS (100%):
med brn-bnshgy, lt brn,
gyshbn, sb rnd-sb ang,
vf-slty gr, mtx-gr sup
cluss, cons wi silc / arg
cmt, tr free pyr, mod calc



10200-10300 SS (100%):
med brn-bnshgy, lt brn,
gyshbn, sb rnd-sb ang,
vf-slty gr, mtx-gr sup
cluss, cons wi silc / arg
cmt, mod calc



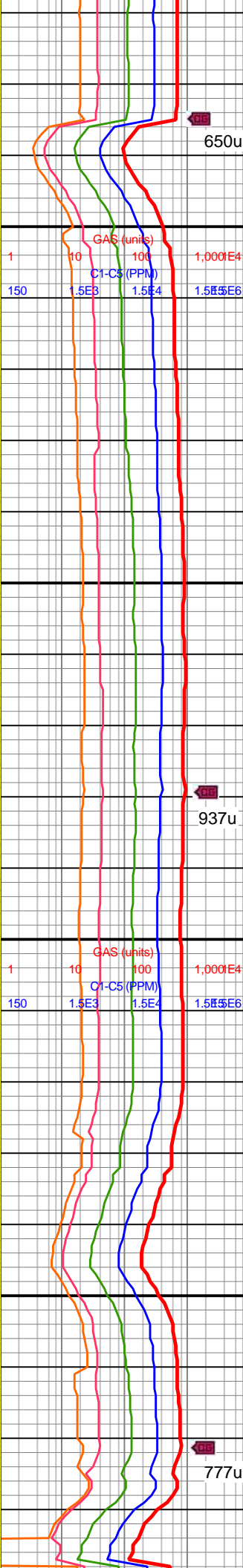
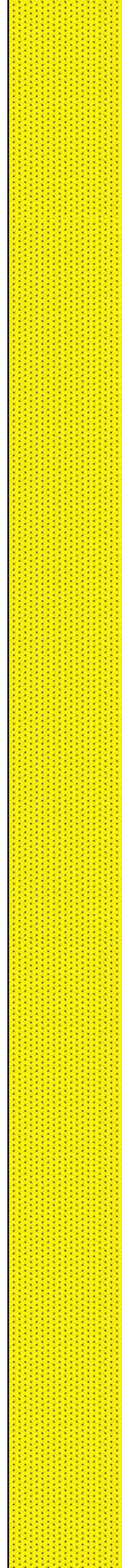


WOB: 32klbs
RPM: 71
SPM: 187
SPP: 5,272psi

MD: 10,408'
INC: 90.75°
AZM: 90.41°
TVD: 7,323.11'
VS: 2,925.54'

MD: 10,502'
INC: 91.58°
AZM: 90.32°
TVD: 7,321.19'
VS: 3,019.27'

MW IN: 10.4
VIS IN: 51
MW OUT: 10.5
VIS OUT: 48

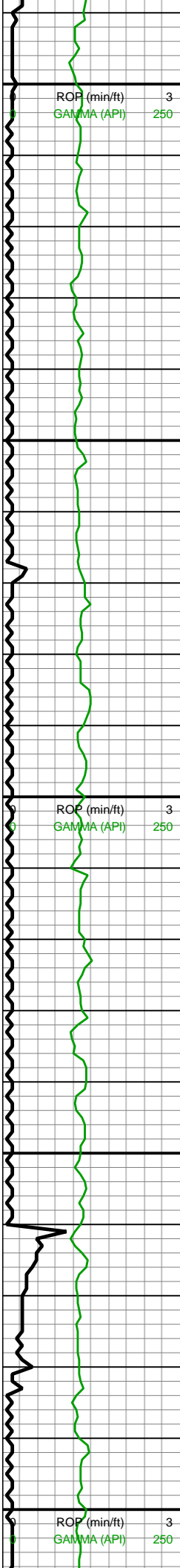


10300-10400 SS (100%):
med brn-bnshgy, lt brn,
gyshbn, sb rnd-sb ang,
vf-slty gr, mtx-gr sup
cluss, cons wi silc / arg
cmt, mod calc, scat sh
frags

10400-10500 SS (100%):
med brn-bnshgy, lt brn,
gyshbn, sb rnd-sb ang,
vf-slty gr, mtx-gr sup
cluss, cons wi silc / arg
cmt, mod calc, scat sh
frags

10500-10600 SS (100%):
med brn-bnshgy, lt brn,





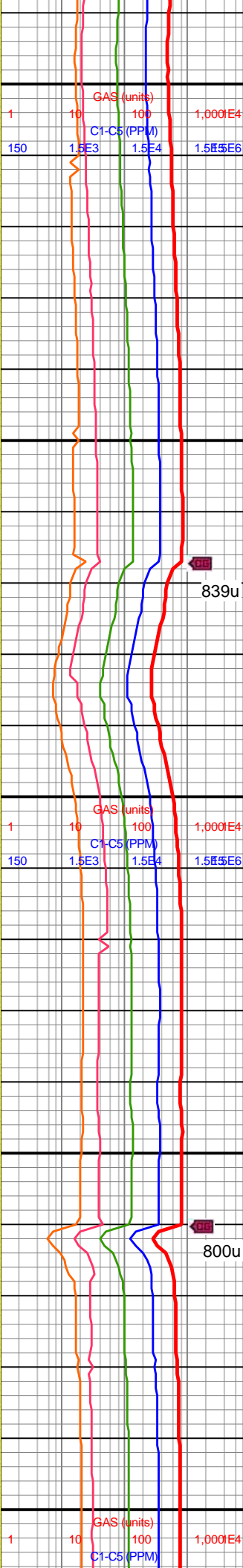
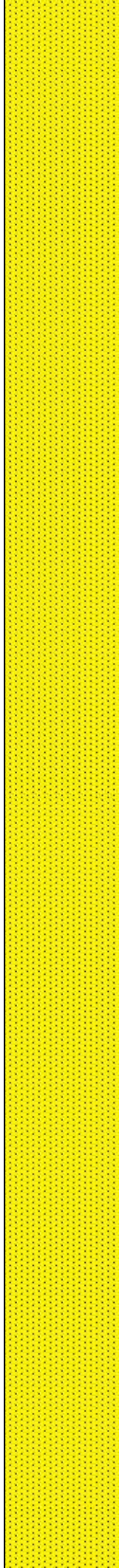
MD: 10,597'
INC: 90.79°
AZM: 89.97°
TVD: 7,319.23'
VS: 3,114.01'

WOB: 27.6klbs
RPM: 71
SPM: 185
SPP: 5,162psi

MD: 10,691'
INC: 91.36°
AZM: 90.14°
TVD: 7,317.47'
VS: 3,207.78'

MW IN: 10.4+
VIS IN: 51
MW OUT: 10.5
VIS OUT: 48

MD: 10,786'
INC: 89.03°
AZM: 88.82°
TVD: 7,317.14'
VS: 3,302.61'

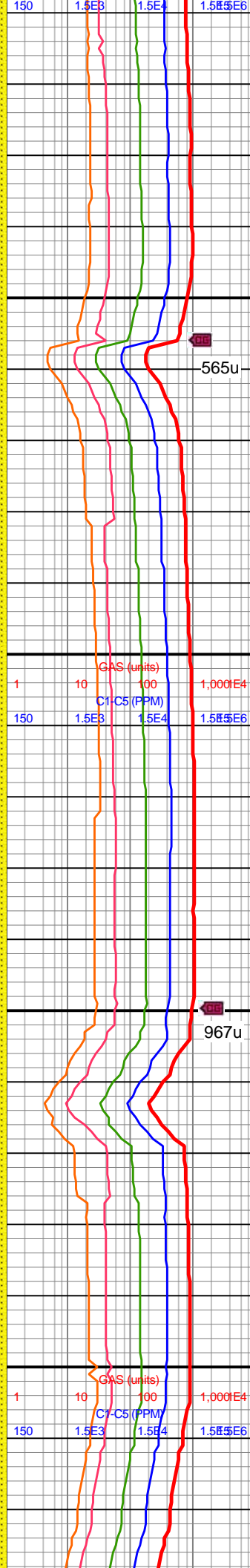
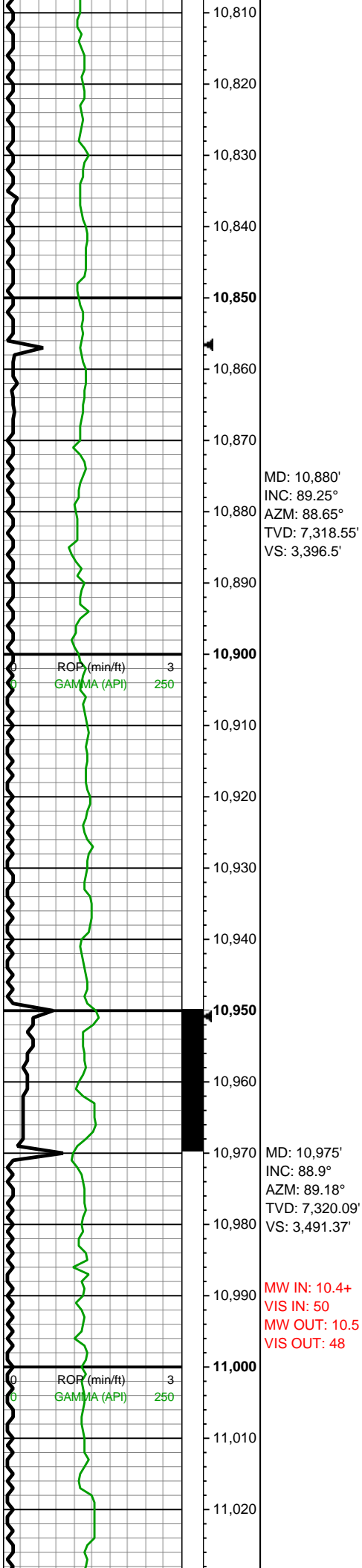


gyshbn, sb rnd-sb ang,
vf-slty gr, mtx-gr sup
cluss, cons wi silc / arg
cmt, mod calc

10600-10700 SS (100%):
med brn-bnshgy, lt brn,
gyshbn, sb rnd-sb ang,
vf-slty gr, mtx-gr sup
cluss, cons wi silc / arg
cmt, mod calc

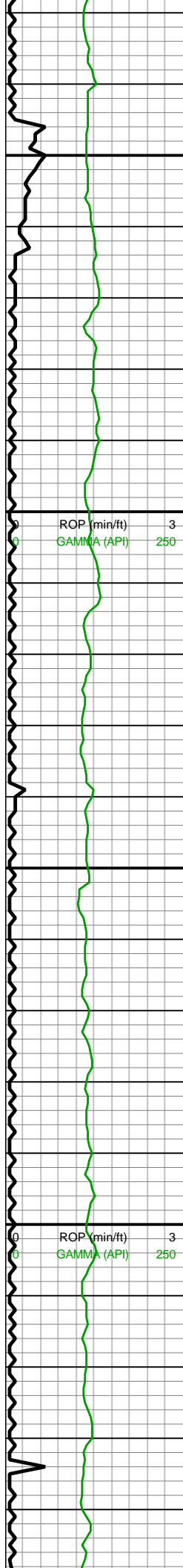
10700-10800 SS (100%):
med brn-bnshgy, lt brn,
gyshbn, sb rnd-sb ang,
vf-slty gr, mtx-gr sup
cluss, cons wi silc / arg
cmt, mod calc





10800-10900 SS (100%):
med brn-bnshgy, lt brn,
gyshbn, sb rnd-sb ang,
vf-slty gr, mtx-gr sup
cluss, cons wi silc / arg
cmt, mod calc

10900-11000 SS (100%):
med brn-bnshgy, lt brn,
gyshbn, sb rnd-sb ang,
vf-slty gr, mtx-gr sup
cluss, cons wi silc / arg
cmt, mod calc, rr free pyr

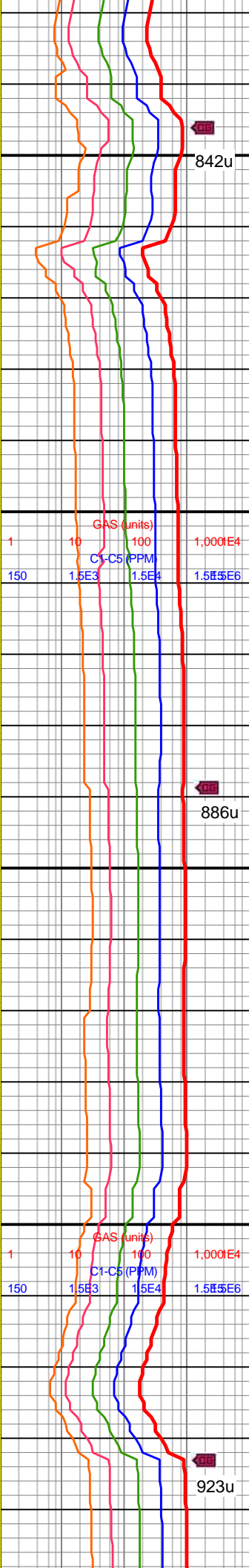
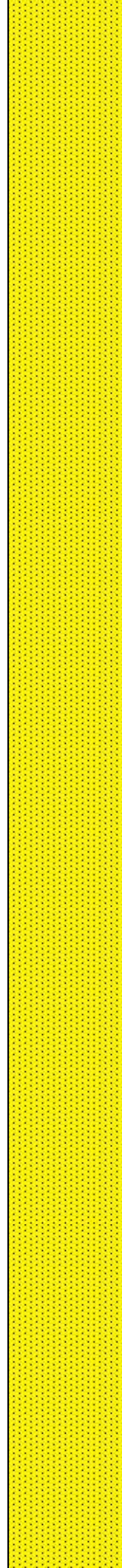


11,030
11,040
11,050
11,060
11,070
11,080
11,090
11,100
11,110
11,120
11,130
11,140
11,150
11,160
11,170
11,180
11,190
11,200
11,210
11,220
11,230
11,240

MD: 11,069'
INC: 90.26°
AZM: 91.99°
TVD: 7,320.78'
VS: 3,585.08'

MD: 11,164'
INC: 91.19°
AZM: 91.99°
TVD: 7,319.57'
VS: 3,679.57'

WOB: 36.3klbs
RPM: 70
SPM: 187
SPP: 5,610psi



11000-11100 SS (100%):
med brn-bnshgy, lt brn,
gyshbn, sb rnd-sb ang,
vf-slty gr, mtx-gr sup
cluss, cons wi silc / arg
cmt, mod calc

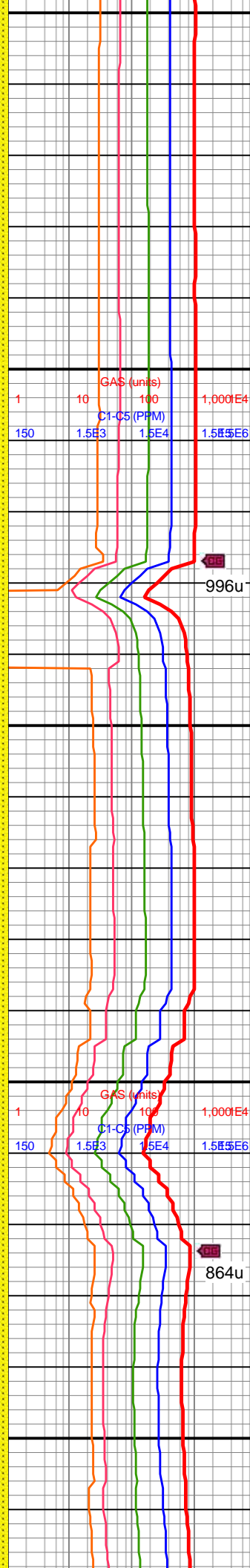
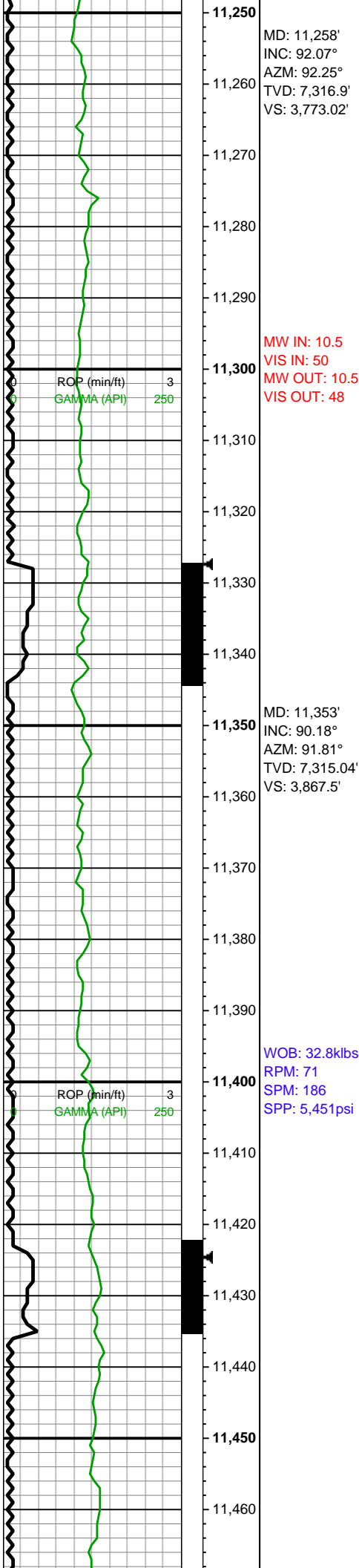
11100-11200 SS (100%):
med brn-bnshgy, lt brn,
gyshbn, sb rnd-sb ang,
vf-slty gr, mtx-gr sup
cluss, cons wi silc / arg
cmt, mod calc, tr sh frags



842u

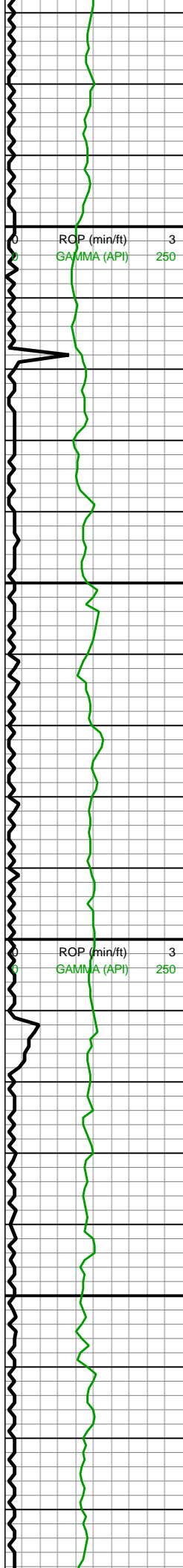
886u

923u



11200-11300 SS (100%):
med brn-bnshgy, lt brn,
gyshbn, sb rnd-sb ang,
vf-sltgy gr, mtx-gr sup
cluss, cons wi silc / arg
cmt, mod calc, tr sh frags

11300-11400 SS (100%):
med brn-bnshgy, lt brn,
gyshbn, sb rnd-sb ang,
vf-sltgy gr, mtx-gr sup
cluss, cons wi silc / arg
cmt, mod calc, rr sh frags



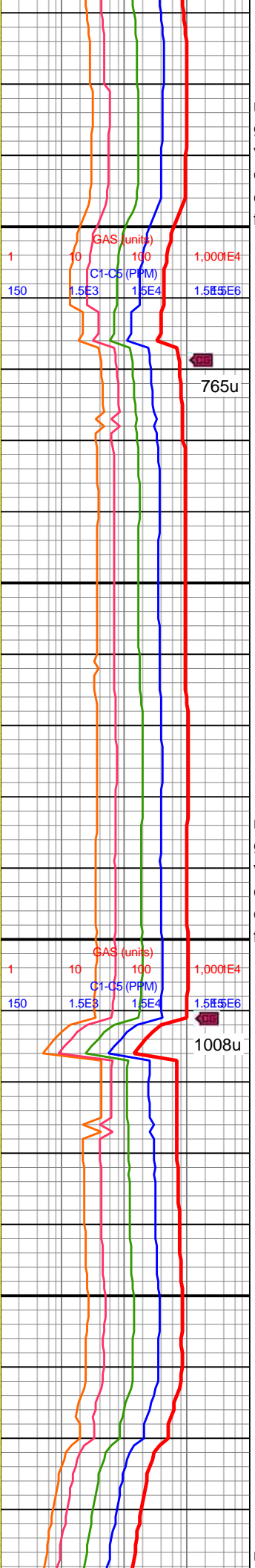
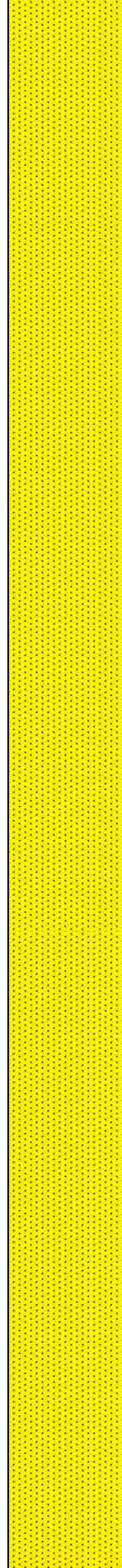
11,470
11,480
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11,500
11,510
11,520
11,530
11,540
11,550
11,560
11,570
11,580
11,590
11,600
11,610
11,620
11,630
11,640
11,650
11,660
11,670
11,680

MW IN: 10.5
VIS IN: 49
MW OUT: 10.5+
VIS OUT: 47

MD: 11,542'
INC: 90.26°
AZM: 90.41°
TVD: 7,315.61'
VS: 4,055.9'

WOB: 33.2klbs
RPM: 70
SPM: 188
SPP: 5,568psi

MD: 11,636'
INC: 91.27°
AZM: 90.41°
TVD: 7,314.36'
VS: 4,149.63'



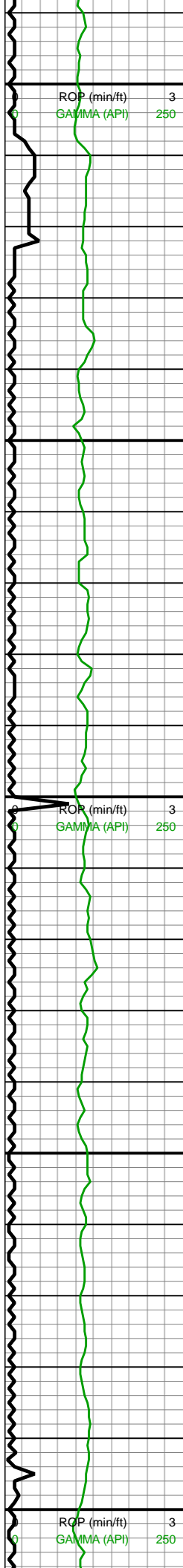
11400-11500 SS (100%):
med brn-bnshgy, lt brn,
gyshbn, sb rnd-sb ang,
vf-slty gr, mtx-gr sup
cluss, cons wi silc / arg
cmt, mod calc, scat sh
frags

765u

11500-11600 SS (100%):
med brn-bnshgy, lt brn,
gyshbn, sb rnd-sb ang,
vf-slty gr, mtx-gr sup
cluss, cons wi silc / arg
cmt, mod calc, scat sh
frags

1008u

11600-11700 SS (100%):
med brn-bnshgy, lt brn,



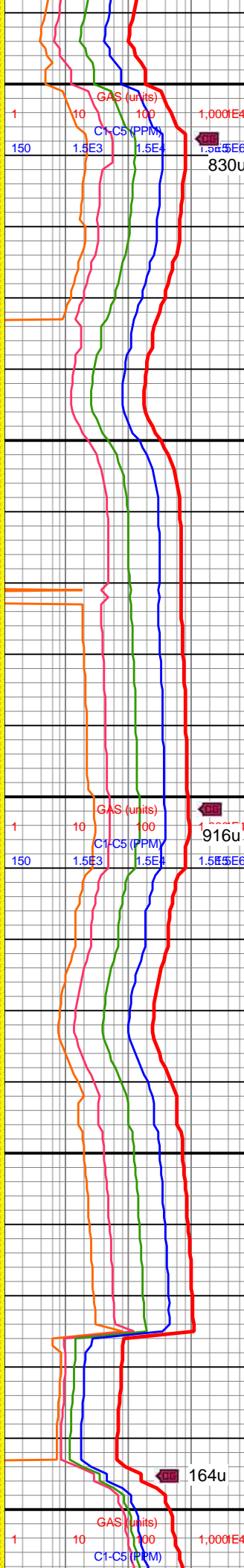
11,690
11,700
11,710
11,720
11,730
11,740
11,750
11,760
11,770
11,780
11,790
11,800
11,810
11,820
11,830
11,840
11,850
11,860
11,870
11,880
11,890
11,900

MW IN: 10.5
VIS IN: 49
MW OUT: 10.5+
VIS OUT: 47

MD: 11,731'
INC: 90.13°
AZM: 88.91°
TVD: 7,313.2'
VS: 4,244.44'

WOB: 36.8klbs
RPM: 71
SPM: 185
SPP: 5,579psi

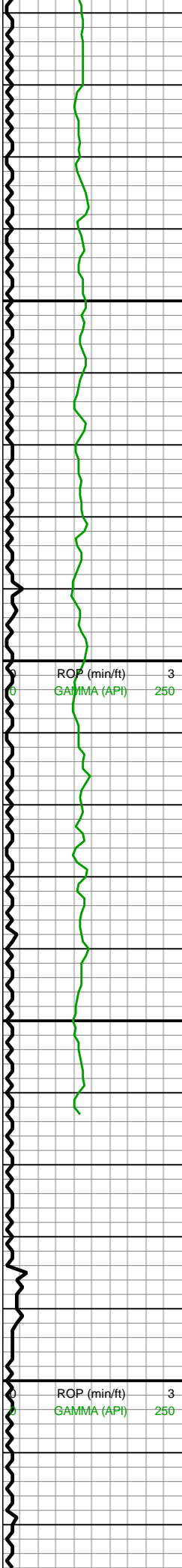
MD: 11,825'
INC: 90.75°
AZM: 88.82°
TVD: 7,312.48'
VS: 4,338.33'



gyshbn, sb rnd-sb ang,
vf-sltly gr, mtx-gr sup
cluss, cons wi silc / arg
cmt, mod calc, tr sh frags

11700-11800 SS (100%):
med brn-bnshgy, lt brn,
gyshbn, sb rnd-sb ang,
vf-sltly gr, mtx-gr sup
cluss, cons wi silc / arg
cmt, mod calc, tr sh frags

11800-11900 SS (100%):
med brn-bnshgy, lt brn,
gyshbn, sb rnd-sb ang,
vf-sltly gr, mtx-gr sup
cluss, cons wi silc / arg
cmt, mod calc, rr sh frags



11,910 MD: 11,919'
INC: 91.36°
AZM: 89.26°
TVD: 7,310.75'
VS: 4,432.19'

11,950

11,990 WOB: 37klbs
RPM: 70
SPM: 186
SPP: 5,600psi

12,010 MD: 12,014'
INC: 92.02°
AZM: 88.82°
TVD: 7,307.94'
VS: 4,527.03'

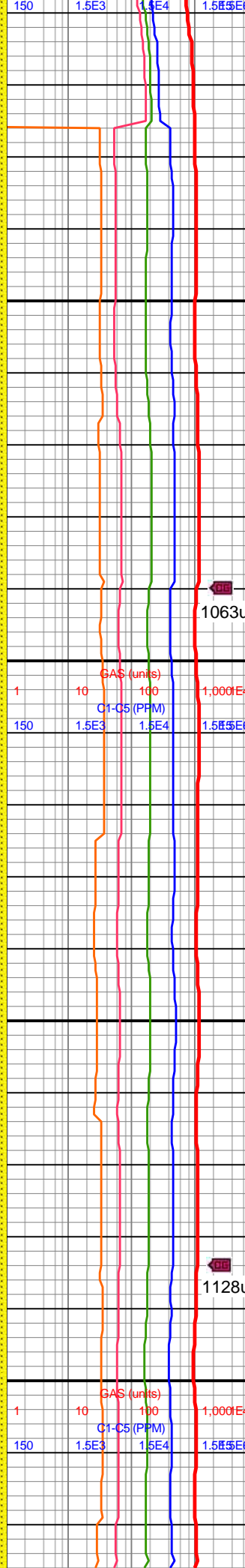
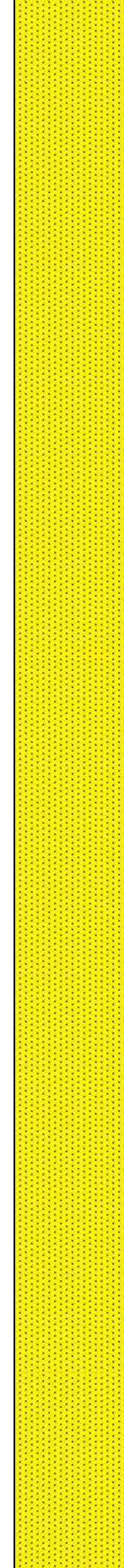
12,030 MW IN: 10.5
VIS IN: 48
MW OUT: 10.5+
VIS OUT: 46

12,050

12,060 MD: 12,057'
INC: 92.42°
AZM: 88.91°
TVD: 7,306.28'
VS: 4,569.95'

12,100

12,120 PROJECTION TO BIT
MD: 12,127'
INC: 92.42°
AZM: 88.91°



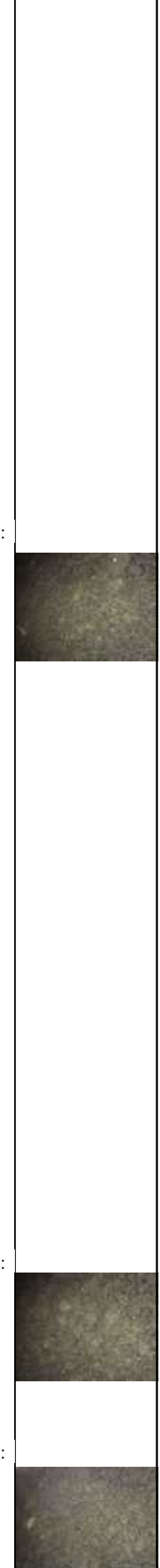
11900-12000 SS (100%):
med brn-bnshgy, lt brn,
gyshbn, sb rnd-sb ang,
vf-slty gr, mtx-gr sup
cluss, cons wi silc / arg
cmt, mod calc

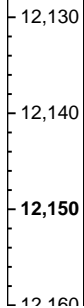
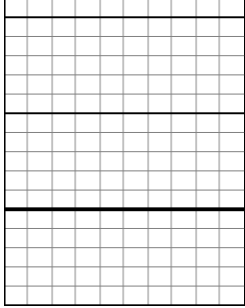
1063u

12000-12100 SS (100%):
med brn-bnshgy, lt brn,
gyshbn, sb rnd-sb ang,
vf-slty gr, mtx-gr sup
cluss, cons wi silc / arg
cmt, mod calc

1128u

12100-12127 SS (100%):
med brn-bnshgy, lt brn,
gyshbn, sb rnd-sb ang,
vf-slty gr, mtx-gr sup
cluss, cons wi silc / arg
cmt, mod calc





AZM: 88.84
TVD: 7,303.32'
VS: 4,639.8'

**Total Depth of
12,127' MD
Reached on
10/20/2018 @
13:15MST**

