



Scale: 5" / 100'
Measured Depth Log

Well Name Herren 1D-33H-H367

Location Sec. 33 T3N R67W

State Colorado

County Weld

Country USA

Rig Number Ensign 153

API Number 05-123-47730

AFE # 16191563

Geographic Region Rockies

Field Wattenberg

Spud Date 12/13/2018

Drilling Completed 12/14/2018

Surface Coordinates Latitude: 40.183261
Longitude: -104.886586

SHL: Sec: 33 Twp: 3N 67W
Footage: 2257 FNL 368 FEL

Bottom Hole Coordinates Proposed BHL: Sec: 33 Twp: 3N 67W
Footages: 105 FNL 460 FWL

Ground Elevation 4,848'

K.B. Elevation 4,871'

Logged Interval 6,500' **To** 12,050'

Total Depth 12,050'

Formation Niobrara B

Type of Drilling Fluid Synthetic Oil Based 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: Heather Davis / Shana Swirin-Miles

Services Provided: 2-Man Mudlogging / Geosteering

Equipment: ML-567

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

Start Date 12/13/2018

Release Date: 12/15/2018

Job #: 1812RK1813

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
 BRYOZOA
 CEPHALOPOD
 CORAL
 CRINOID

F FOSSIL

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

ARGILLACEOUS

ARGILLITE GRAIN
 BENTONITE
 BITUMENOUS SUBSTANCE
 BRECCIA FRAGMENTS
 CALCAREOUS
 CARBONACEOUS FLAKES
 CHTDK
 CHTLT
 COAL - THIN BEDS
 DOLOMITE

GLAUCONITE

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

Stringer

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

CRINOID
ECHINOID
FISH
FORAMINIFERA

STROMATOPOROID
Minerals
ANHYDRITIC

DOLOMITIC
FELDSPAR
FERRUGINOUS PELLET
FERRUGINOUS

SANDY
SILICEOUS
SILTY
TUFFACEOUS

SANDSTONE STRINGER
SHALE STRINGER
SILTSTONE STRINGER

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

Other Symbols

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

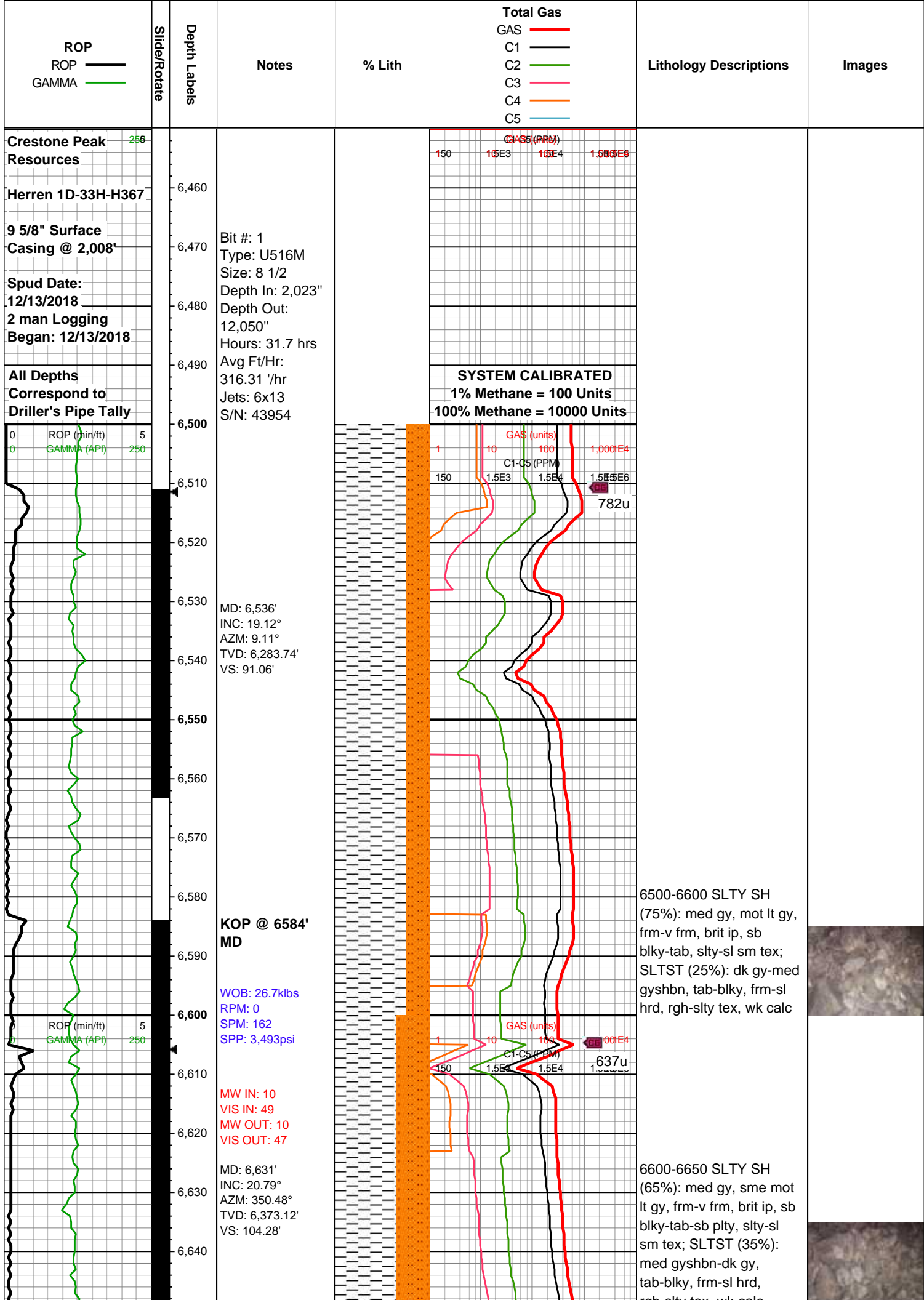
Textures

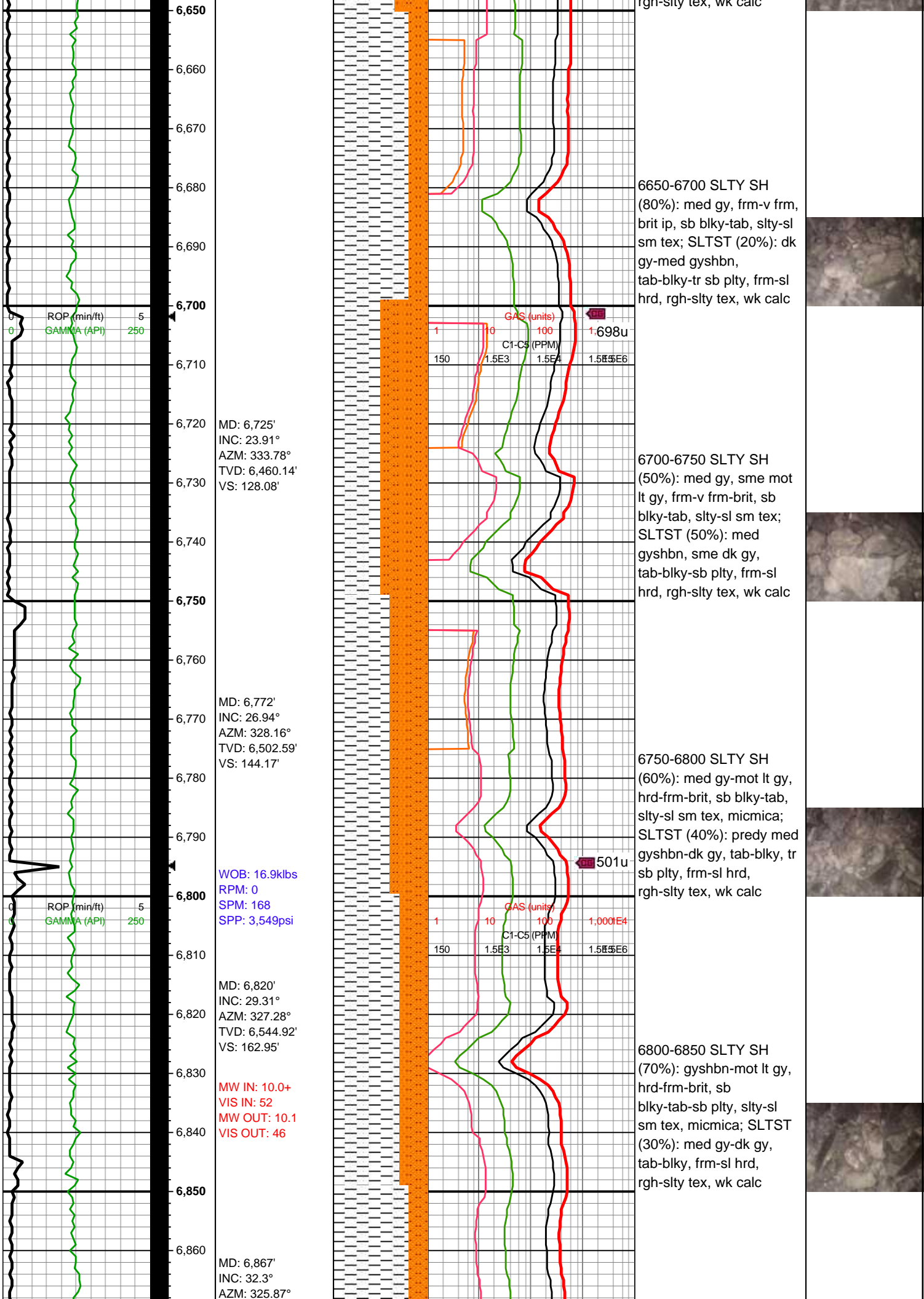
BOUNDSTONE
CHALKY
CRYPTOXLN
EARTHY
FINELYXLN
GRAINSTONE

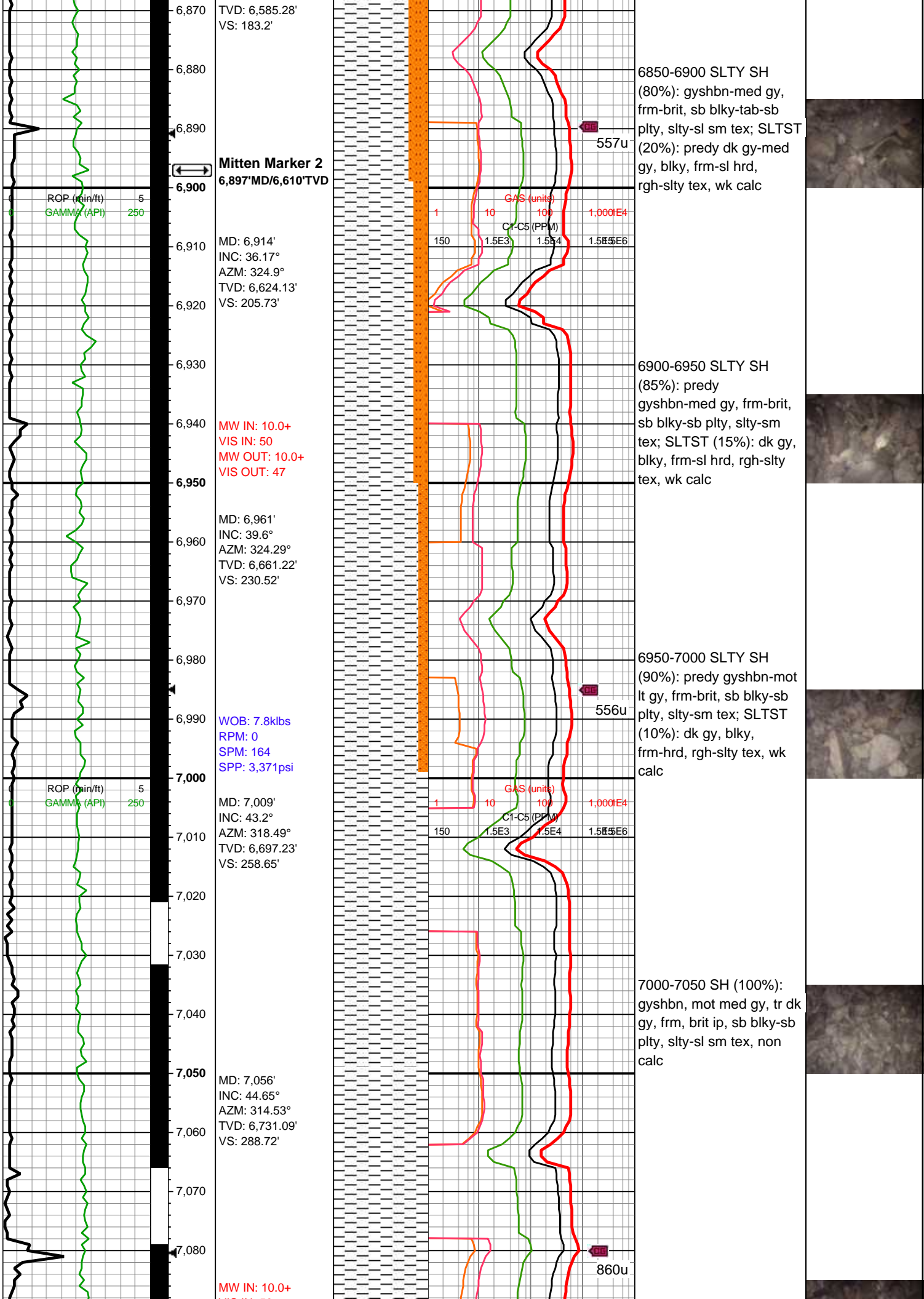
LITHOGRAPHIC
MICROXLN
MUDSTONE
PACKSTONE
WACKESTONE

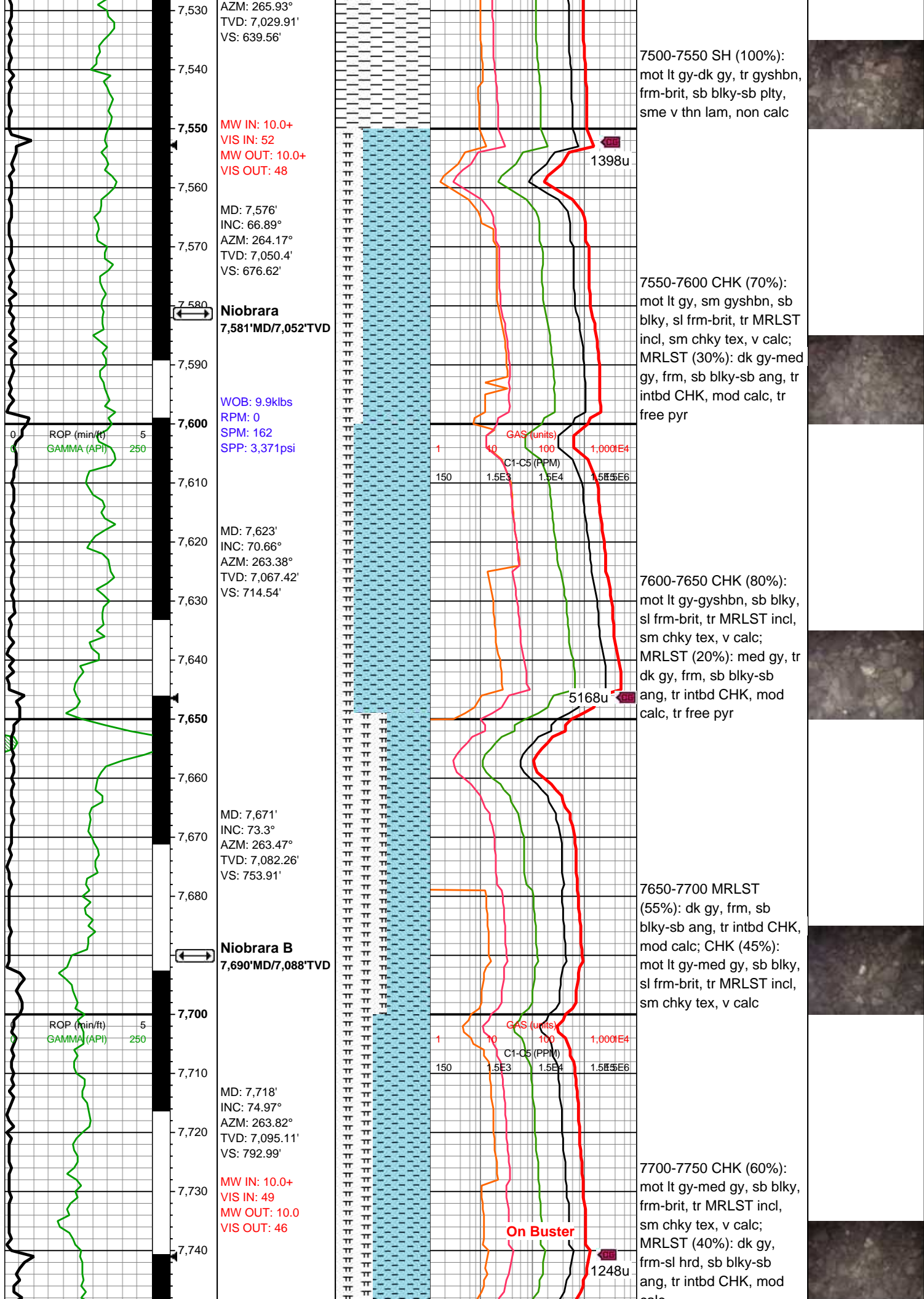
Sorting

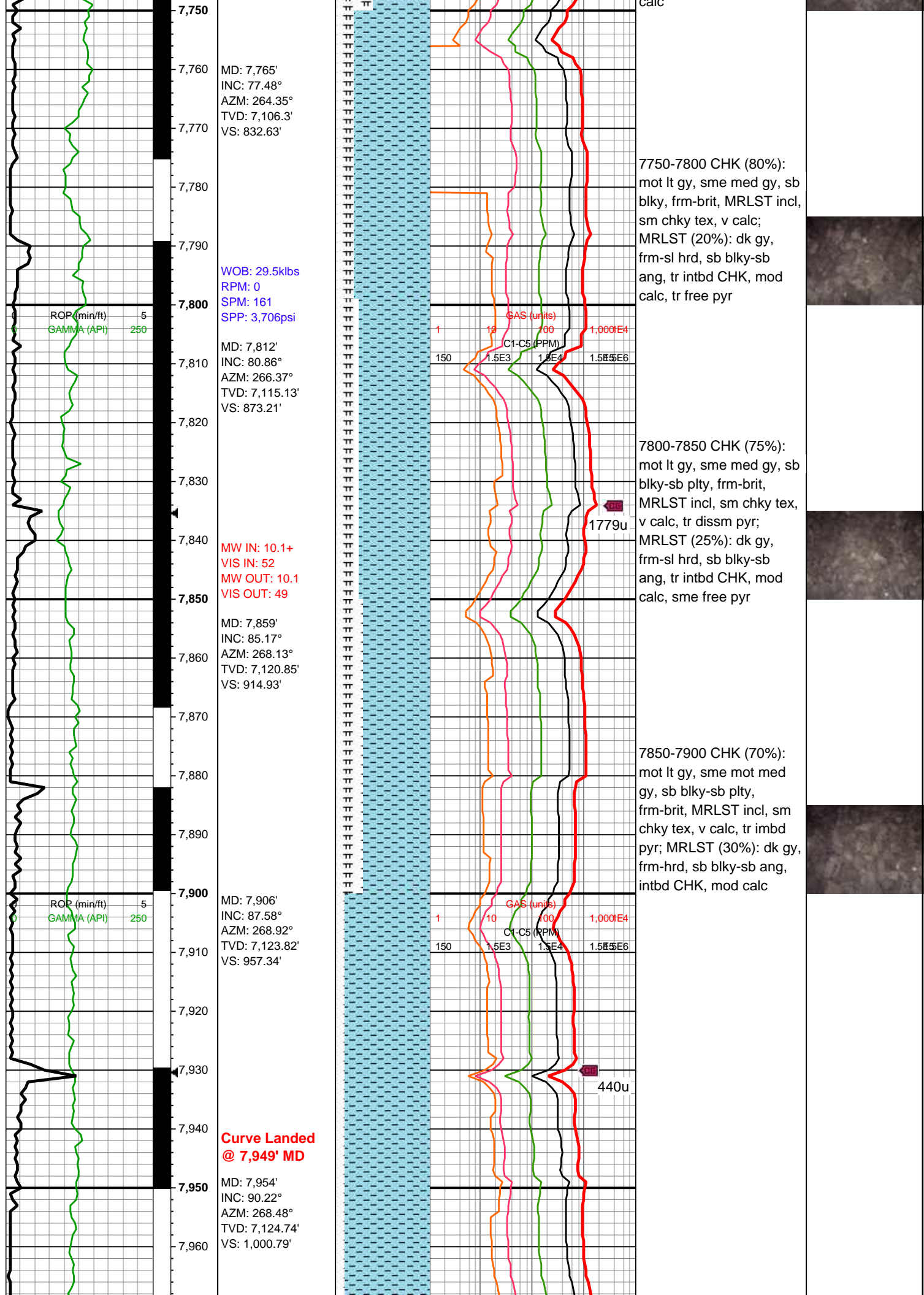
MODERATE
POOR
WELL

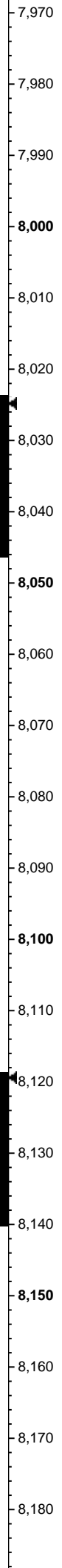
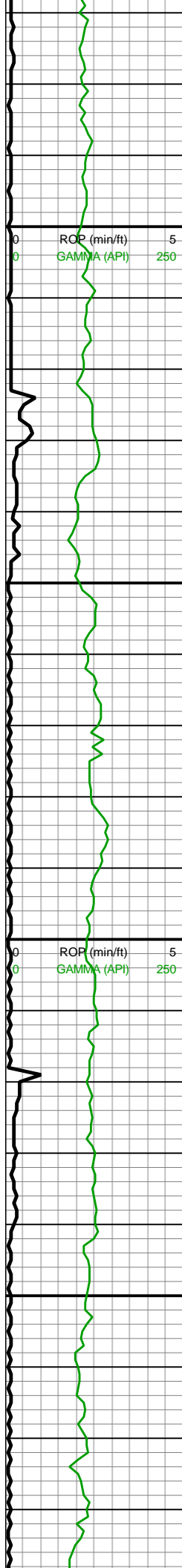










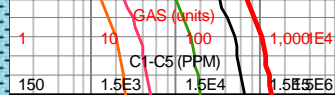
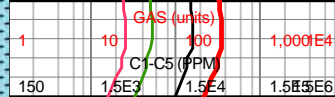


WOB: 32.4klbs
RPM: 35
SPM: 192
SPP: 5,103psi

MW IN: 10.1+
VIS IN: 53
MW OUT: 10.1+
VIS OUT: 48

MD: 8,049'
INC: 89.12°
AZM: 270.5°
TVD: 7,125.29'
VS: 1,087.36'

MD: 8,143'
INC: 88.2°
AZM: 272.08°
TVD: 7,127.49'
VS: 1,174.16'

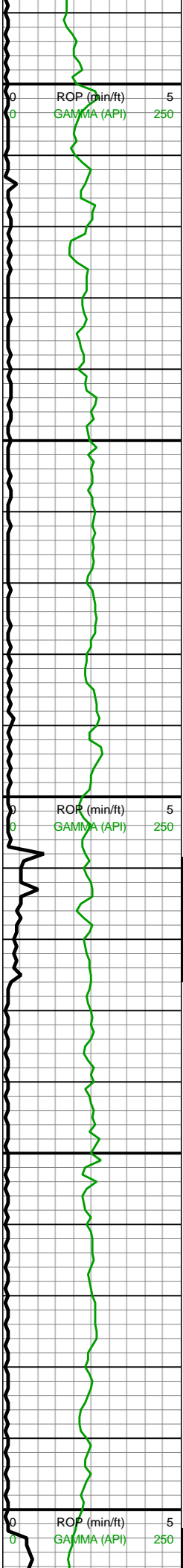


7900-8000 CHK (90%):
mot lt gy, sb blkgy-sb plty,
frm-brit, sme MRLST incl,
sm chky tex, v calc, tr
imbd pyr; MRLST (10%):
dk gy, frm-hrd, sb blkgy-sb
ang, sme intbd CHK,
mod calc

8000-8100 CHK (65%):
mot lt-med gy, sb blkgy-sb
plty, sl frm-brit, sme
MRLST incl, sm chky tex,
v calc, tr imbd pyr; MRLST
(35%): dk gy, frm-hrd, sb
blkgy-sb ang, sme intbd
CHK, mod calc

8100-8200 CHK (80%):
mot med gy, sb blkgy-sb
plty, frm-brit, sme MRLST
incl, sm chky tex, v calc, tr
imbd pyr; MRLST (20%):





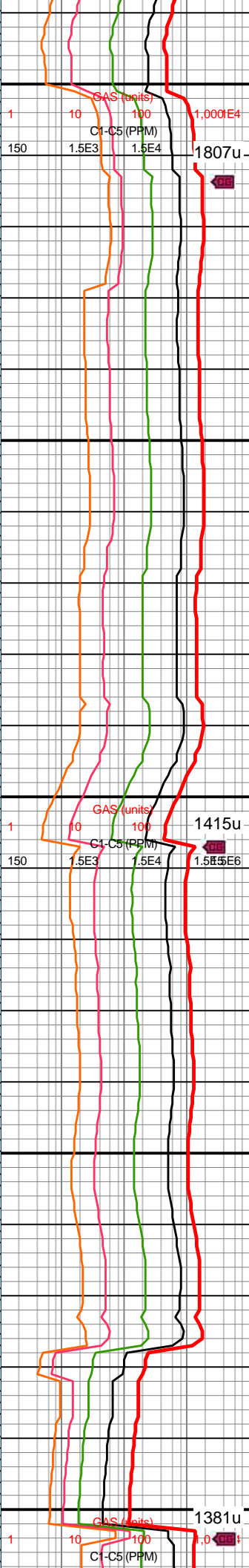
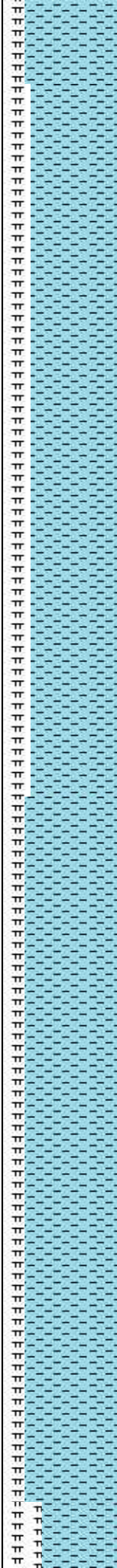
WOB: 34.8klbs
RPM: 70
SPM: 192
SPP: 5,169psi

MD: 8,238'
INC: 87.45°
AZM: 272.08°
TVD: 7,131.09'
VS: 1,262.35'

MW IN: 10.1+
VIS IN: 53
MW OUT: 10.1+
VIS OUT: 48

MD: 8,332'
INC: 88.64°
AZM: 272.7°
TVD: 7,134.3'
VS: 1,349.8'

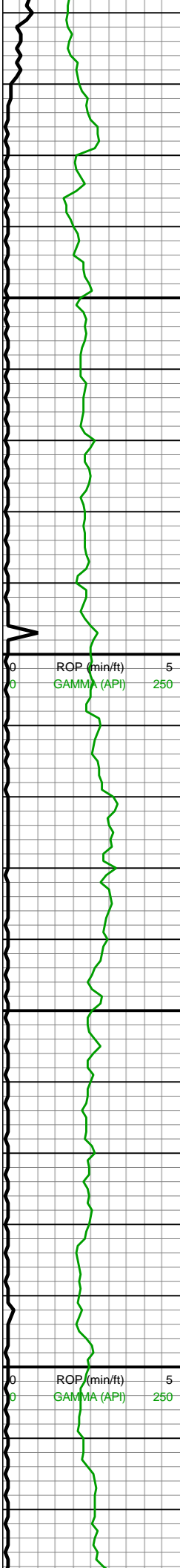
WOB: 33.1klbs
RPM: 70
SPM: 194
SPP: 5,078psi



dk gy, frm-hrd, sb blkly-sb
ang, sme intbd CHK,
mod calc

8200-8300 CHK (75%):
mot med gy, sb blkly-sb
plty, frm-brit, sme MRLST
incl, sl sm chky tex, v
calc, rr imbd pyr; MRLST
(25%): dk gy, frm-hrd, sb
blkly-sb ang, sme intbd
CHK, mod calc

8300-8400 CHK (80%):
mot med gy, sb blkly-sb
plty, frm-brit, occ MRLST
incl, sl sm chky tex, v
calc, tr imbd pyr; MRLST
(20%): dk gy, frm-hrd, sb
blkly-sb ang, occ intbd
CHK, mod calc



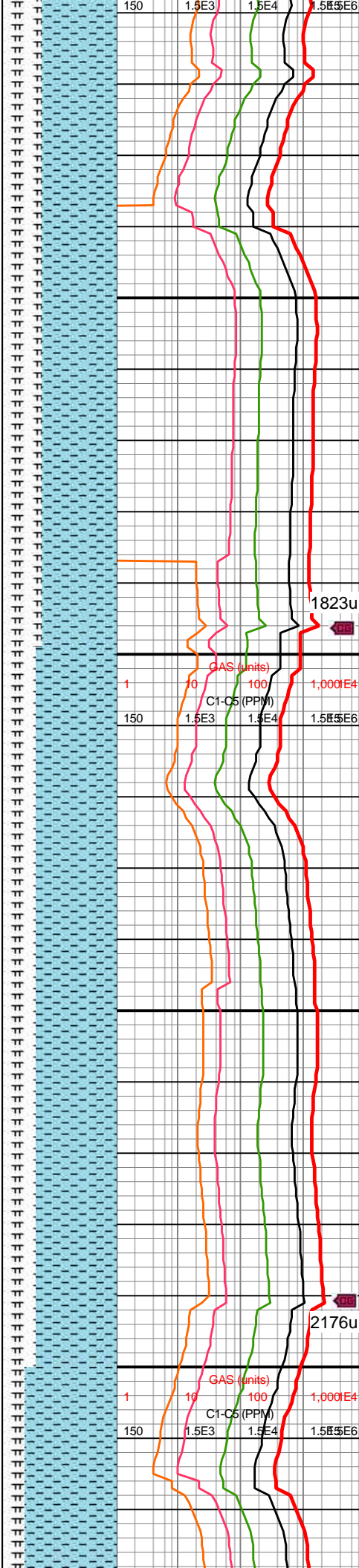
MD: 8,427'
INC: 91.14°
AZM: 272.96°
TVD: 7,134.48'
VS: 1,438.49'

MD: 8,521'
INC: 90.92°
AZM: 272.96°
TVD: 7,132.79'
VS: 1,526.32'

MW IN: 10.2
VIS IN: 52
MW OUT: 10.2
VIS OUT: 48

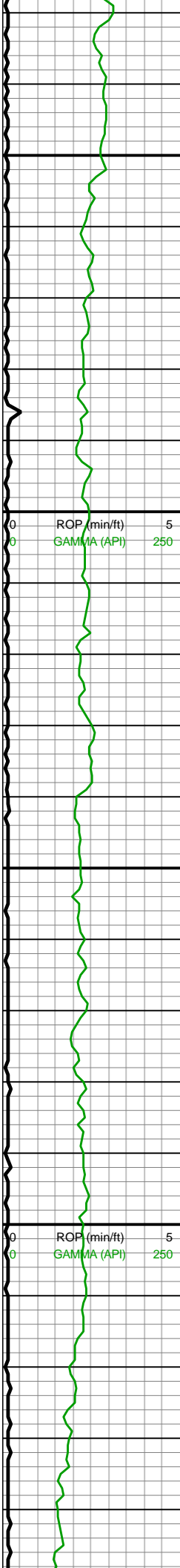
WOB: 25.7klbs
RPM: 70
SPM: 192
SPP: 5,061psi

MD: 8,616'
INC: 91.01°
AZM: 272.79°
TVD: 7,131.19'
VS: 1,615.04'



8400-8500 CHK (65%):
mot lt-med gy, sb blkly-sb
plty, sl frm-brit, sme
MRLST incl, sm chky tex,
v calc, tr imbd pyr; MRLST
(35%): dk gy, frm-hrd, sb
blkly-sb ang, sme intbd
CHK, mod calc

8500-8600 CHK (70%):
mot lt-med gy, sb blkly-sb
plty, frm-brit, MRLST incl,
sm chky tex, v calc, occ
imbd pyr; MRLST (30%):
dk gy, frm-hrd, sb blkly-sb
ang, intbd CHK, mod calc

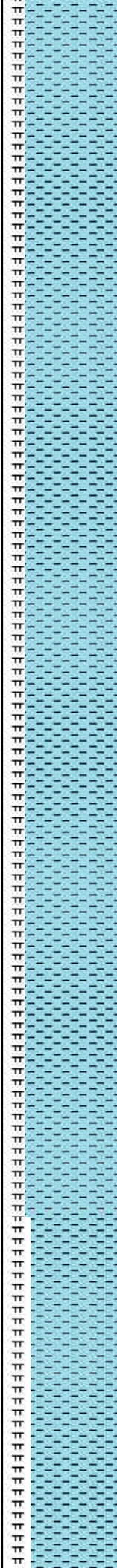


8,630
8,640
8,650
8,660
8,670
8,680
8,690
8,700
8,710
8,720
8,730
8,740
8,750
8,760
8,770
8,780
8,790
8,800
8,810
8,820
8,830
8,840

MD: 8,710'
INC: 91.19°
AZM: 272.52°
TVD: 7,129.39'
VS: 1,702.69'

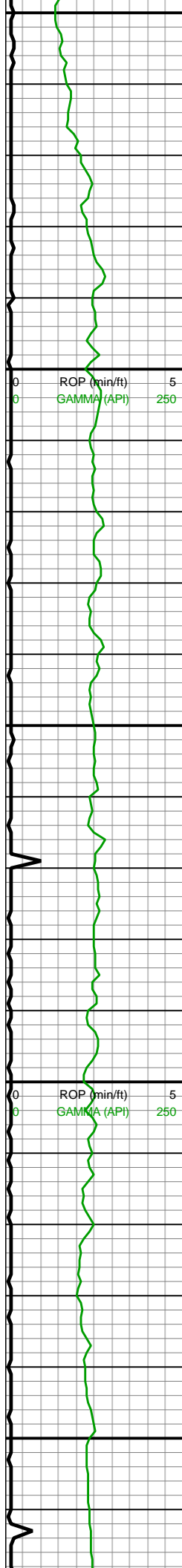
WOB: 34.4klbs
RPM: 70
SPM: 192
SPP: 5,262psi

MD: 8,804'
INC: 91.23°
AZM: 272.43°
TVD: 7,127.4'
VS: 1,790.23'



8600-8700 CHK (70%):
predy mot lt-med gy, scatt
med gyshbn, sb blkyl-sb
plty, sl frm-brit, MRLST
incl, sl sm-grty chky, v
calc, com imbd pyr;
MRLST (30%): dk gy,
frm-hrd, sb blkyl-sb ang,
intbd CHK, mod calc, occ
pyr nod

8700-8800 CHK (70%):
predy mot lt-med gy, scatt
med gyshbn, sb blkyl-sb
plty, sl frm-brit, MRLST
incl, sl sm-grty chky, v
calc, com imbd pyr;
MRLST (30%): med-dk
gy, frm-hrd, sb blkyl-sb
ang, intbd CHK, mod
calc, tr pyr nod

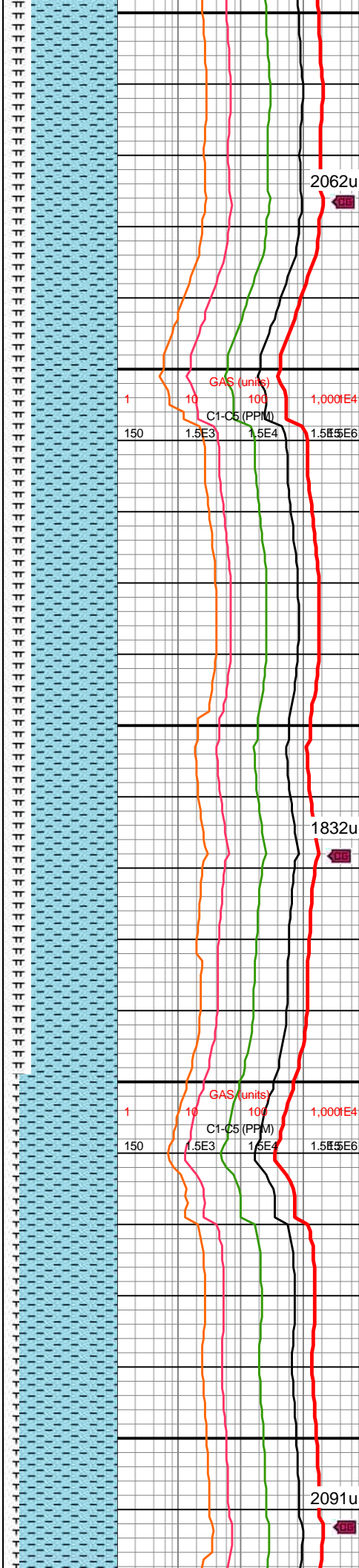


8,850
8,860
8,870
8,880
8,890
8,900
8,910
8,920
8,930
8,940
8,950
8,960
8,970
8,980
8,990
9,000
9,010
9,020
9,030
9,040
9,050
9,060

MD: 8,898'
INC: 91.06°
AZM: 271.91°
TVD: 7,125.52'
VS: 1,877.59'

MD: 8,993'
INC: 89.91°
AZM: 271.73°
TVD: 7,124.72'
VS: 1,965.67'

WOB: 32.7klbs
RPM: 71
SPM: 196
SPP: 5,362psi



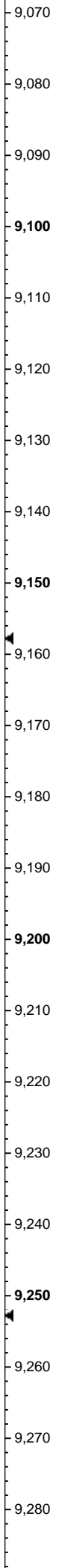
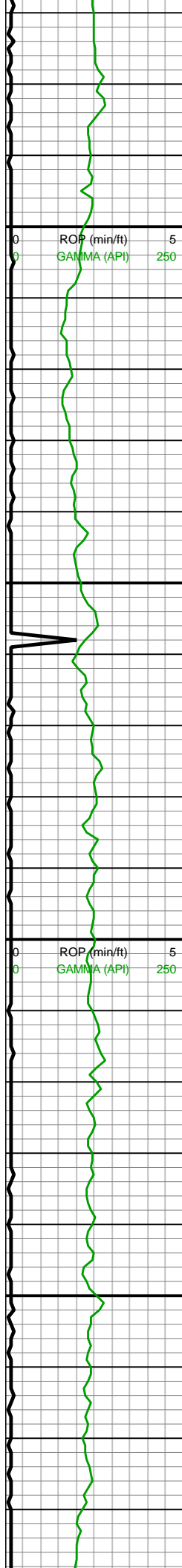
8800-8900 CHK (75%):
predy mot lt-med gy, occ
med gyshbn, sb blkyl-sb
plty, sl frm-brit, MRLST
incl, sl sm-grty chky, v
calc, com imbd pyr;
MRLST (25%): med-dk
gy, frm-hrd, sb blkyl-sb
ang, intbd CHK, mod
calc, occ pyr nod

8900-9000 CHK (75%):
predy mot lt-med gyshbn,
sme crm, sb blkyl-sb plty,
sl brit-sft, MRLST incl, sl
sm-grty chky, v calc, com
imbd pyr; MRLST (25%):
med-dk gy, frm-hrd, sb
blkyl-sb ang, intbd CHK,
mod calc, occ pyr nod

2062u

1832u

2091u



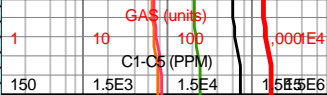
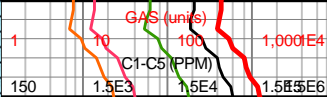
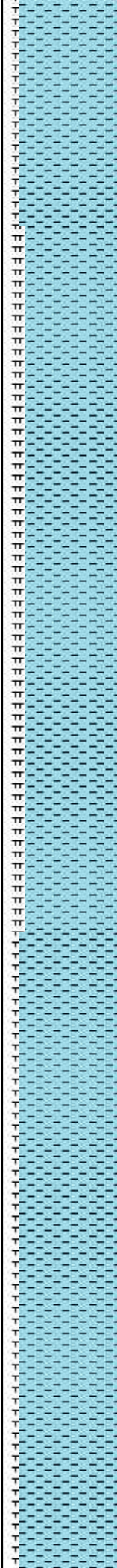
MD: 9,088'
INC: 90.13°
AZM: 271.91°
TVD: 7,124.68'
VS: 2,053.76'

MD: 9,182'
INC: 89.47°
AZM: 271.82°
TVD: 7,125.01'
VS: 2,140.95'

WOB: 36klbs
RPM: 70
SPM: 197
SPP: 5,468psi

MW IN: 10.2
VIS IN: 49
MW OUT: 10.2
VIS OUT: 46

MD: 9,277'
INC: 89.82°
AZM: 271.82°
TVD: 7,125.6'
VS: 2,229.03'



9000-9100 CHK (85%):
predy mot lt-med gyshbn,
sme crm, sb blk-y-sb plty,
sl brit-sft, MRLST incl, sl
sm-grty chky, v calc, tr
imbd pyr; MRLST (15%):
med-dk gy, frm-hrd, sb
blk-y-sb ang, scat intbd
CHK, mod calc, occ pyr
nod

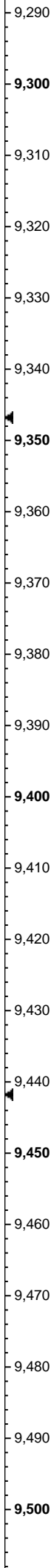
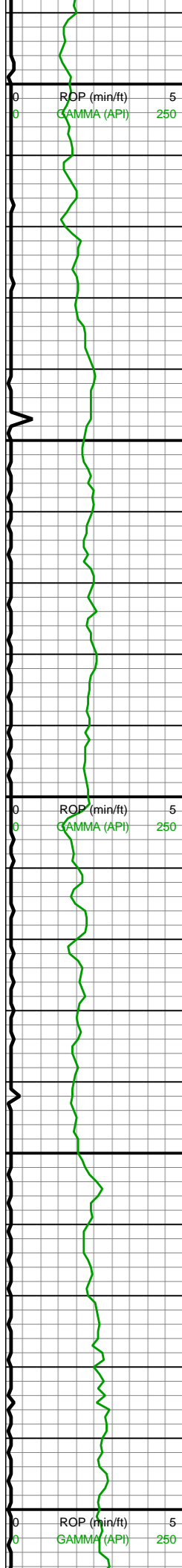
9100-9200 CHK (80%):
predy mot lt-med gyshbn,
scat crm, blk-y-sb blk-y,
brit-sft, MRLST incl, sl
sm-grty chky, v calc, rr
imbd pyr; MRLST (20%):
med-dk gy, frm-hrd, sb
blk-y-sb ang, scat intbd
CHK, mod calc, tr pyr nod

9200-9300 CHK (85%):
predy mot lt-med gyshbn,
scat crm, blk-y-sb blk-y, sl
brit-sft, MRLST incl, sl
sm-grty chky, v calc;
MRLST (15%):



2029u

1527u

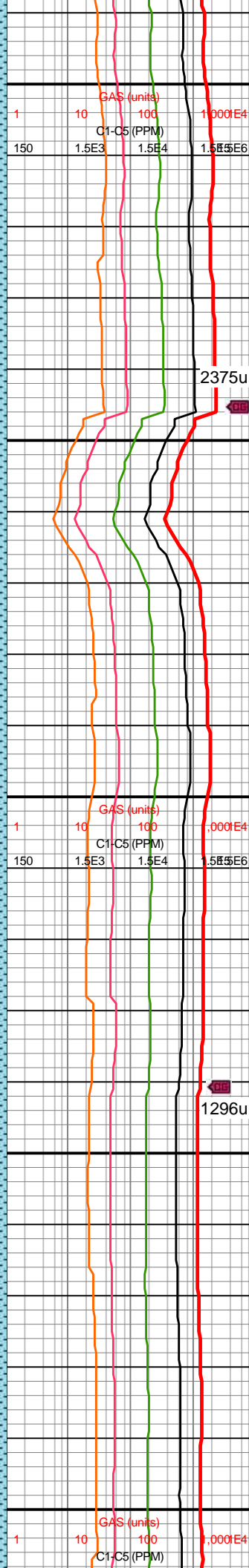
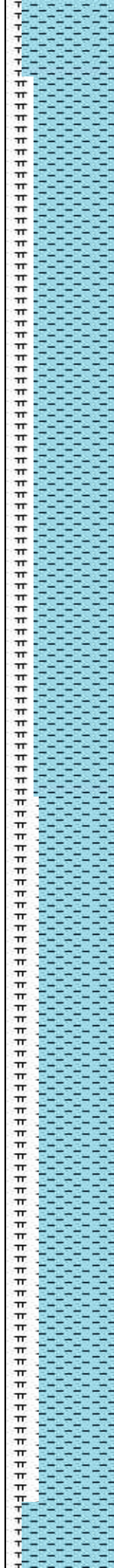


MD: 9,371'
INC: 89.91°
AZM: 271.64°
TVD: 7,125.82'
VS: 2,316.14'

WOB: 35.4klbs
RPM: 71
SPM: 194
SPP: 5,393psi

MD: 9,465'
INC: 89.3°
AZM: 271.56°
TVD: 7,126.47'
VS: 2,403.16'

MW IN: 10.2
VIS IN: 48
MW OUT: 10.2
VIS OUT: 45

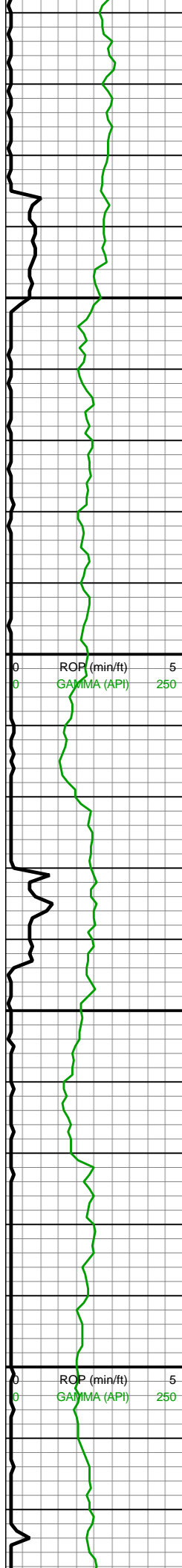


MRLST (15%): med-dk
gy, frm-hrd, sb blkly-sb
ang, scat intbd CHK,
mod calc, rr pyr nod

9300-9400 CHK (75%):
predy mot lt-med gyshbn,
scat crm, blkly-sb blkly, sl
brit-sft, MRLST incl, sl
sm-grty chky, v calc;
MRLST (25%): med-dk
gy, frm-hrd, sb blkly-sb
ang, scat intbd CHK,
mod calc, rr pyr nod

9400-9500 CHK (70%):
predy mot lt-med gyshbn,
sme med gy, scat crm,
blkly-sb blkly, sl brit-sft,
MRLST incl, sl sm-grty
chky, v calc; MRLST
(30%): med-dk gy,
frm-hrd, sb blkly-sb ang,
scat intbd CHK, mod
calc, tr pyr nod





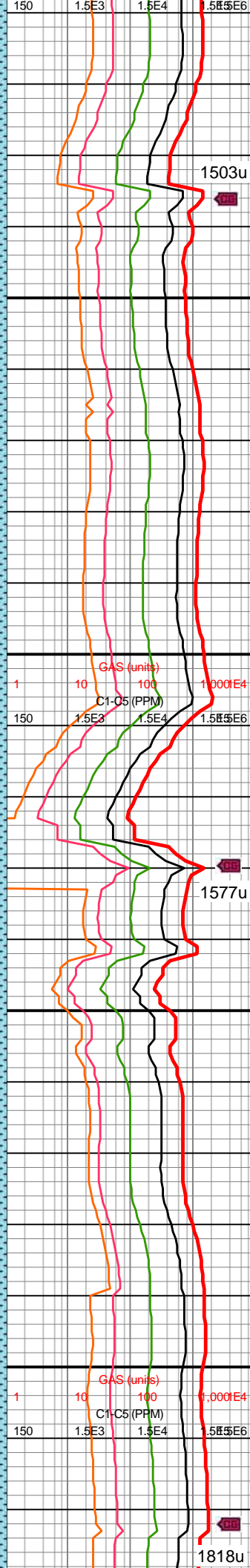
9,510
9,520
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9,540
9,550
9,560
9,570
9,580
9,590
9,600
9,610
9,620
9,630
9,640
9,650
9,660
9,670
9,680
9,690
9,700
9,710
9,720

MD: 9,560'
INC: 91.41°
AZM: 271.99°
TVD: 7,125.88'
VS: 2,491.22'

WOB: 35.7klbs
RPM: 70
SPM: 197
SPP: 5,458psi

MW IN: 10.2
VIS IN: 48
MW OUT: 10.2
VIS OUT: 46

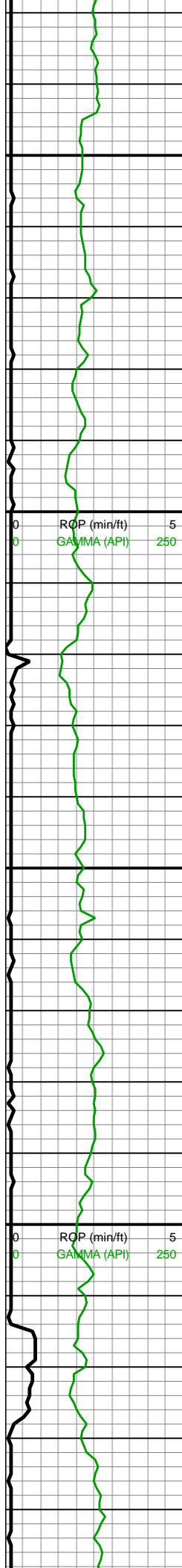
MD: 9,654'
INC: 92.51°
AZM: 269.8°
TVD: 7,122.67'
VS: 2,577.74'



9500-9600 CHK (85%):
predy mot lt-med gysbhn,
sme med gy, scat crm,
blky-sb blky, sl brit-sft,
MRLST incl, sl sm-grty
chky, v calc; MRLST
(15%): med-dk gy,
frm-hrd, sb blky-sb ang,
scat intbd CHK, mod
calc, tr pyr nod

9600-9700 CHK (65%):
predy mot med gysbhn,
sme med gy, tr crm,
blky-sb blky, sl frm-brit,
MRLST incl, sl sm, chky,
v calc; MRLST (35%):
med-dk gy, frm-hrd, sb
blky-sb ang, scat intbd
CHK, mod calc, occ pyr
nod, occ pp pyr





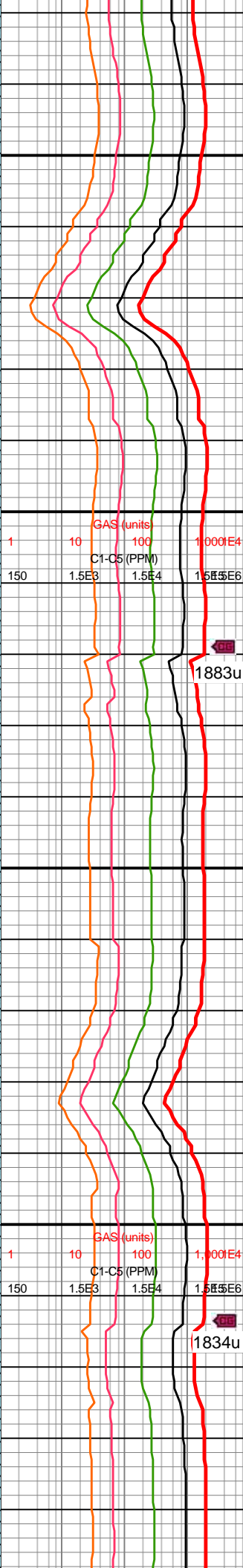
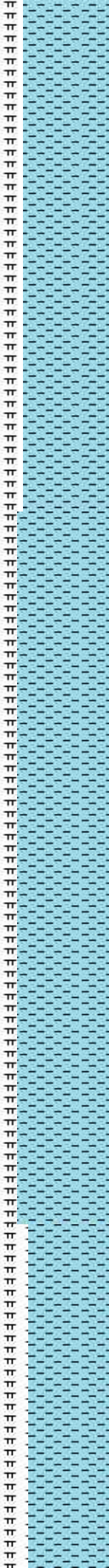
MD: 9,749'
INC: 93.34°
AZM: 269.45°
TVD: 7,117.82'
VS: 2,664.29'

WOB: 37.5klbs
RPM: 70
SPM: 194
SPP: 5,285psi

MD: 9,843'
INC: 94.13°
AZM: 269.09°
TVD: 7,111.7'
VS: 2,749.61'

MW IN: 10.2
VIS IN: 47
MW OUT: 10.2
VIS OUT: 45

MD: 9,937'
INC: 92.68°
AZM: 268.04°
TVD: 7,106.11'
VS: 2,834.48'



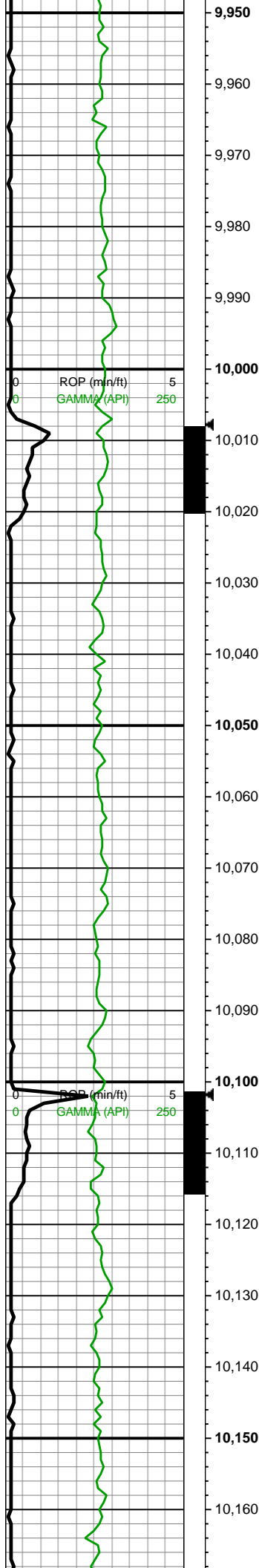
9700-9800CHK (75%):
mot med gyshbn, lt gy,
blky-sb blky, sl frm-brit,
MRLST incl, sl sm, chky,
v calc; MRLST (25%):
med-dk gy, frm-hrd, sb
blky-sb ang, scat intbd
CHK, mod calc, occ pp
pyr

1883u

9800-9900 CHK (80%):
predy med gyshbn, lt gy,
mot-sl stri, blky-sb blky,
sl frm-brit, tr MRLST incl,
sl sm, chky, v calc;
MRLST (20%): med-dk
gy, frm-hrd, sb blky-sb
ang, tr intbd CHK, mod
calc, occ pp pyr

1834u

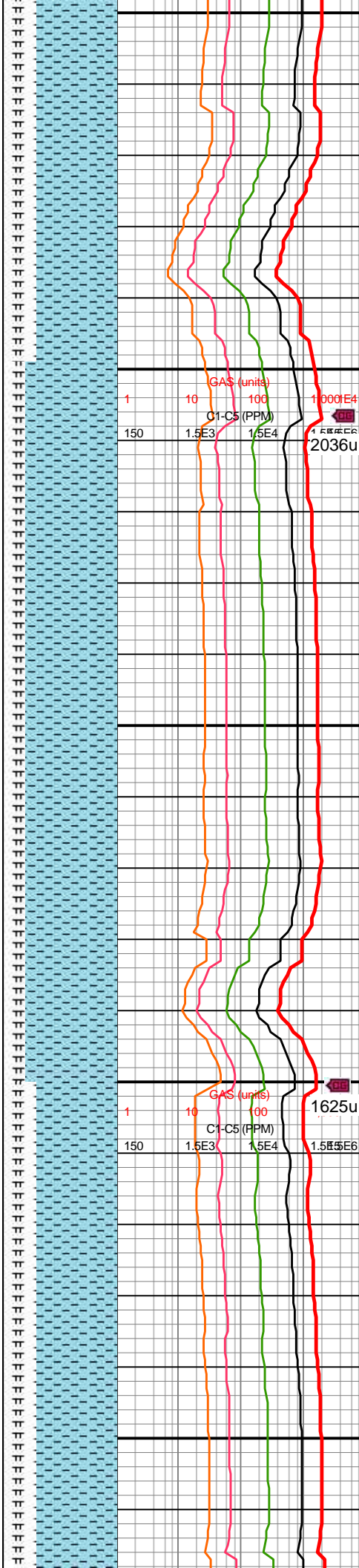




WOB: 34klbs
RPM: 71
SPM: 194
SPP: 5,328psi

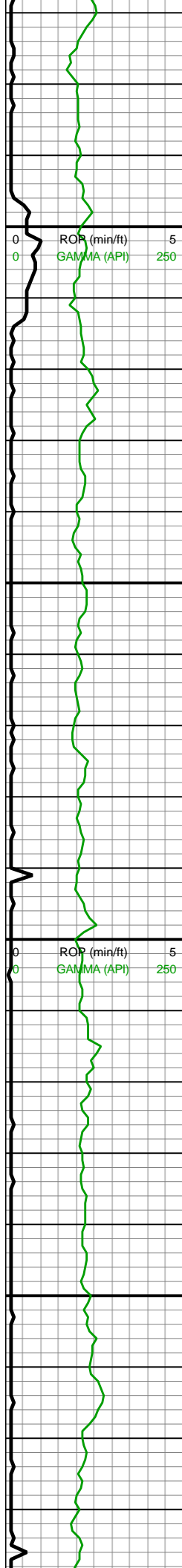
MD: 10,032'
INC: 91.19°
AZM: 268.22°
TVD: 7,102.91'
VS: 2,920.05'

MD: 10,126'
INC: 90.31°
AZM: 269.01°
TVD: 7,101.67'
VS: 3,005.1'



9900-10000 CHK (70%):
gyshbn, mot-sl stri, sb
blky, sl frm, tr MRLST
lamn, sm chky tex, v calc;
MRLST (30%): dk gy-dk
gyshbn, mot, sl hd-frm,
sb blky, tr intbd CHK,
mod calc

10000-10100 CHK
(80%): med gyshbn,
mot-stri, sb blky, frm-brit,
tr MRLST lamn, sm chky
tex, mod calc; MRLST
(20%): dk gy-dk gyshbn,
mot, sl hd-frm, sb blky-sb
ply, tr intbd CHK, mod
calc

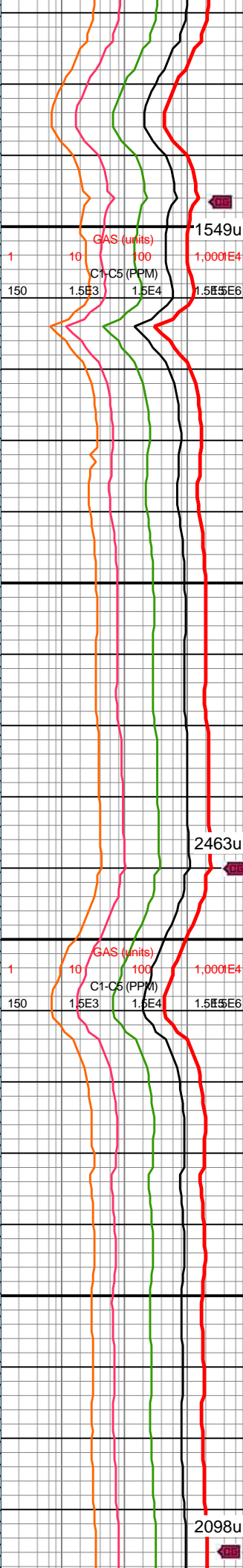
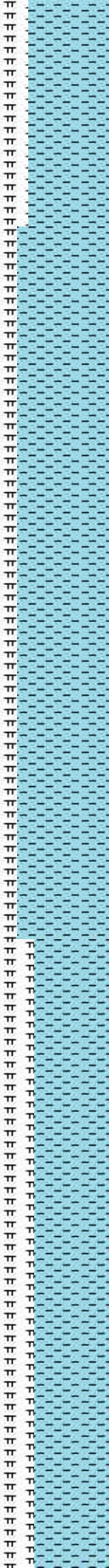


WOB: 53klbs
RPM: 0
SPM: 196
SPP: 5,074psi

MD: 10,221'
INC: 89.03°
AZM: 270.76°
TVD: 7,102.22'
VS: 3,091.93'

MW IN: 10.2
VIS IN: 46
MW OUT: 10.2
VIS OUT: 44

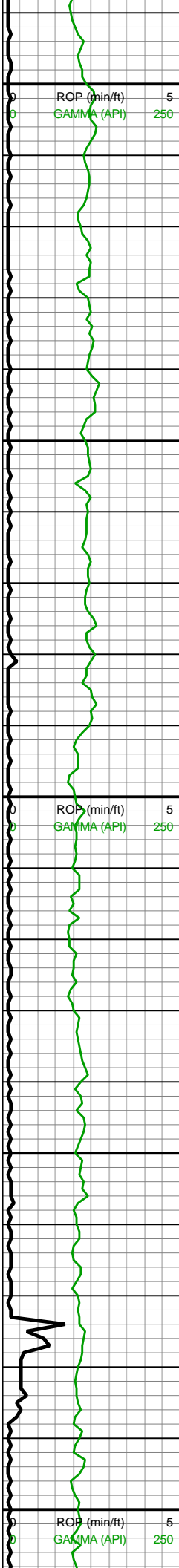
MD: 10,315'
INC: 89.08°
AZM: 270.32°
TVD: 7,103.77'
VS: 3,178.27'



10100-10200 CHK
(70%): med gyshbn,
mot-stri, sb blk, frm-brit,
tr MRLST lamn, sm chky
tex, mod calc; MRLST
(30%): dk gy-dk gyshbn,
mot, sl hd-frm, sb blk-sb
ply, tr intbd CHK, mod
calc

10200-10300 CHK
(80%): med gyshbn,
mot-stri, sb blk, frm-brit,
tr MRLST lamn, sm chky
tex, mod calc; MRLST
(20%): dk gy-dk gyshbn,
mot, sl hd-frm, sb blk-sb
ply, tr intbd CHK, mod
calc

10300-10400 CHK
(65%): predy mot med
gyshbn, sme med gy, tr
crm, blk-sb blk, sl
frm-brit, MRLST incl, sl
sm, chky, v calc; MRLST
(35%): med-dk gy,
frm brd, sb blk-sb ply



WOB: 35.9klbs
RPM: 70
SPM: 194
SPP: 5,347psi

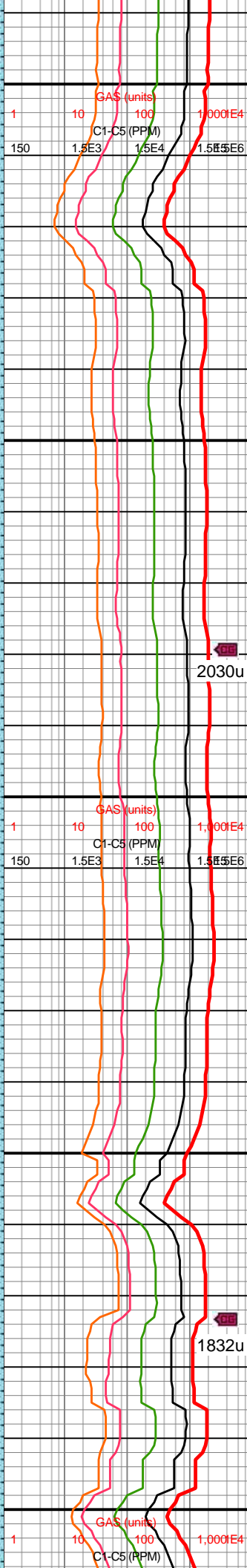
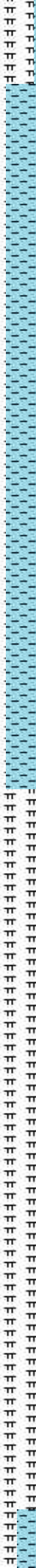
MD: 10,409'
INC: 89.47°
AZM: 269.18°
TVD: 7,104.96'
VS: 3,264.09'

MW IN: 10.2
VIS IN: 46
MW OUT: 10.2
VIS OUT: 44

MD: 10,504'
INC: 89.74°
AZM: 268.57°
TVD: 7,105.62'
VS: 3,350.24'

MD: 10,598'
INC: 89.82°
AZM: 269.8°
TVD: 7,105.98'
VS: 3,435.68'

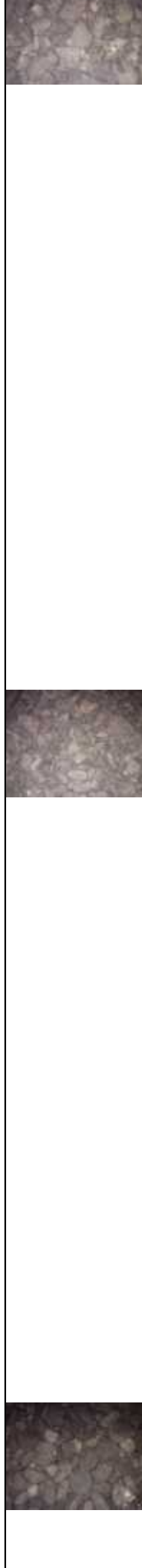
WOB: 36.2klbs
RPM: 70
SPM: 195
SPP: 5,444psi

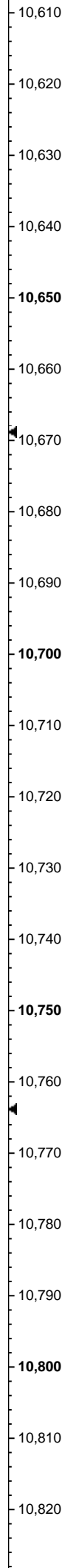
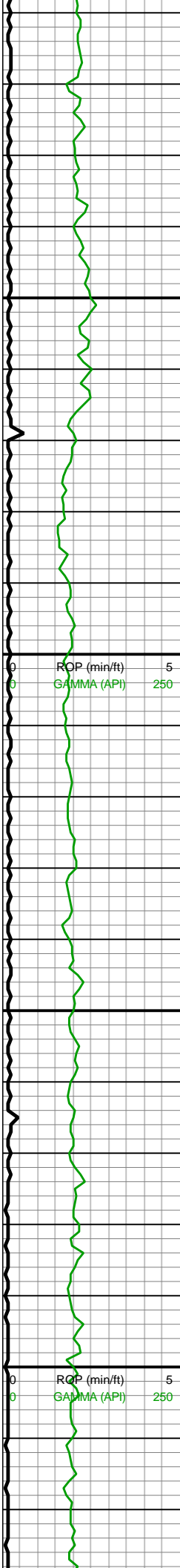


frm-hrd, sb blkyl-sb ang,
scat intbd CHK, mod
calc, occ pyr nod, occ pp
pyr

10400-10500 CHK
(90%): predy mot med
gyshbn, sme med gy, tr
crm, blkyl-sb blkyl, sl
frm-brit, MRLST incl, sl
sm, chky, v calc; MRLST
(10%): med-dk gy,
frm-hrd, sb blkyl-sb ang,
scat intbd CHK, mod
calc, occ pyr nod, occ pp
pyr

10500-10600 CHK
(60%): gyshbn, mot-sl
stri, sb blkyl, sl frm, tr
MRLST lamn, sm chky
tex, v calc; MRLST (40%):
dk gy-dk gyshbn, mot,
hd-frm, sb blkyl, tr intbd
CHK, mod calc, occ pyr
nod



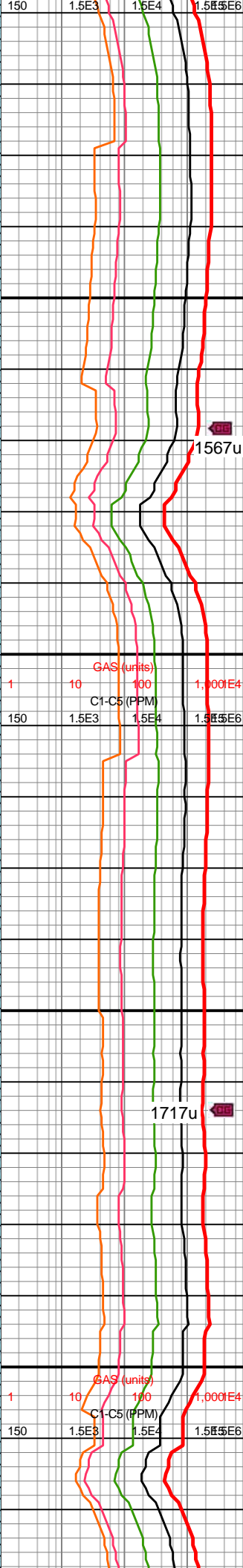
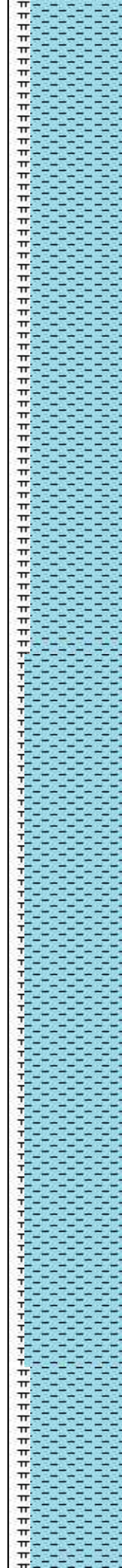


SPP: 5,444psi

MD: 10,693'
INC: 89.17°
AZM: 269.36°
TVD: 7,106.82'
VS: 3,522.31'

MW IN: 10.3
VIS IN: 46
MW OUT: 10.2+
VIS OUT: 44

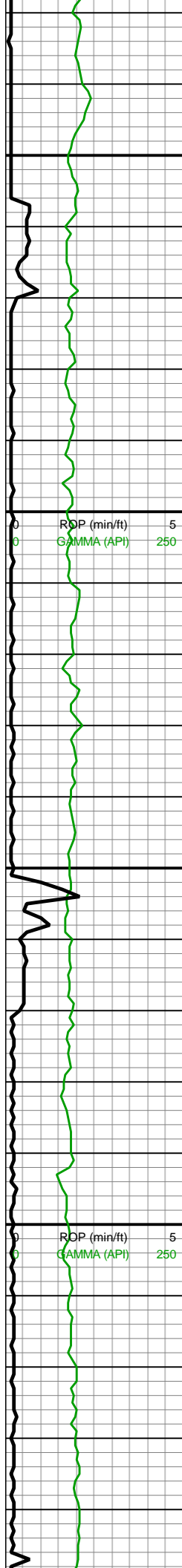
WOB: 27.1klbs
RPM: 70
SPM: 195
SPP: 5,570psi



10600-10700 CHK
(80%): predy mot med gyshbn, sme med gy, tr crm, blkysb blkys, sl frm-brit, MRLST incl, sl sm, chky, v calc; MRLST (20%): dk gy-dk gyshbn, mot, hd-frm, sb blkys, tr intbd CHK, mod calc, tr pyr nod

10700-10800 CHK
(85%): predy mot med gyshbn, sme med gy, tr crm, blkysb blkys, sl frm-brit, MRLST incl, sl sm, chky, v calc; MRLST (15%): dk gy-dk gyshbn, mot, hd-frm, sb blkys, tr intbd CHK, mod calc, tr pyr nod





10,830
10,840
10,850
10,860
10,870
10,880
10,890
10,900
10,910
10,920
10,930
10,940
10,950
10,960
10,970
10,980
10,990
11,000
11,010
11,020
11,030
11,040

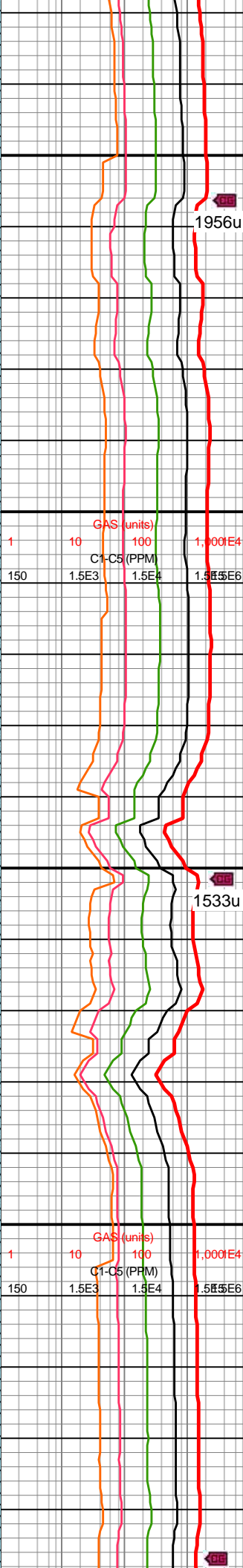
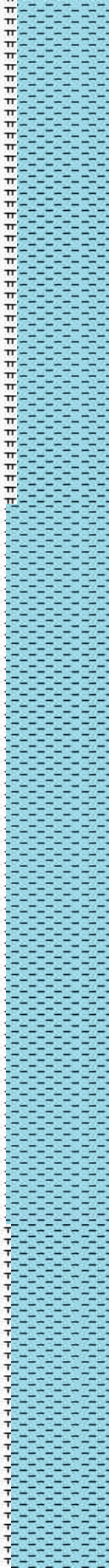
MD: 10,882'
INC: 89.25°
AZM: 268.74°
TVD: 7,108.94'
VS: 3,694.01'

MW IN: 10.3
VIS IN: 46
MW OUT: 10.3
VIS OUT: 44

MD: 10,977'
INC: 89.03°
AZM: 269.8°
TVD: 7,110.37'
VS: 3,780.42'

WOB: 33.6klbs
RPM: 71
SPM: 196
SPP: 5,463psi

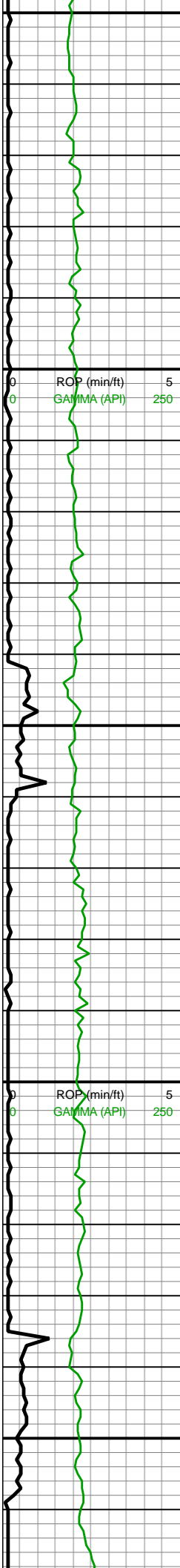
MW IN: 10.3
VIS IN: 46
MW OUT: 10.3+
VIS OUT: 44



10800-10900 CHK
(80%): predy mot med
gyshbn, sme med gy,
blky-sb blky, sl frm-brit,
MRLST incl, sl sm, chky,
v calc; MRLST (20%): dk
gy, mot, hd-frm, sb blky, tr
intbd CHK, mod calc, rr
pyr nod

10900-11000 CHK
(90%): mot med
gyshbn-med gy, blky-sb
blky, sl frm-brit, MRLST
incl, sl sm, chky, v calc;
MRLST (10%): dk gy,
mot, hd-frm, sb blky, tr
intbd CHK, mod calc





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
11,250
11,260

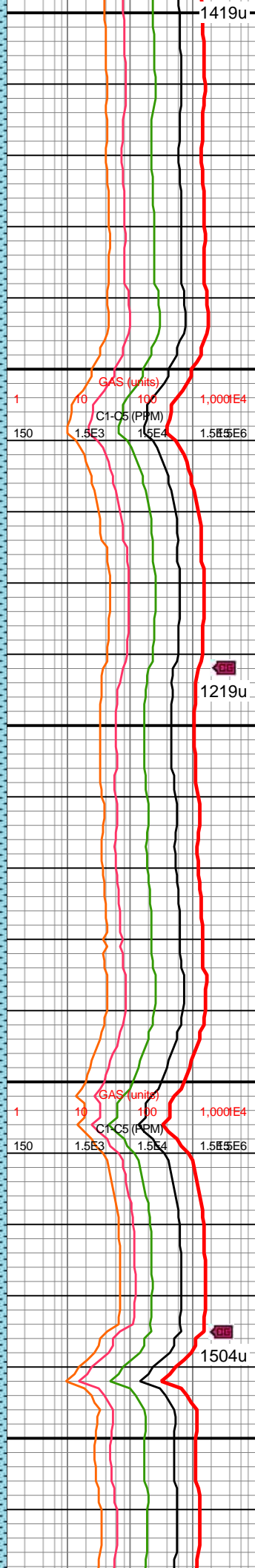
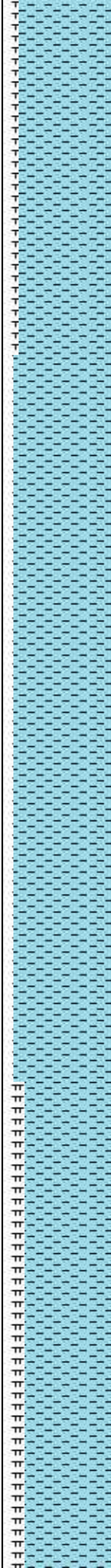
MD: 11,071'
INC: 88.95°
AZM: 269.53°
TVD: 7,112.03'
VS: 3,866.18'

MD: 11,166'
INC: 87.85°
AZM: 269.01°
TVD: 7,114.68'
VS: 3,952.56'

WOB: 37.7klbs
RPM: 70
SPM: 193
SPP: 5,534psi

MW IN: 10.3
VIS IN: 47
MW OUT: 10.3+
VIS OUT: 44

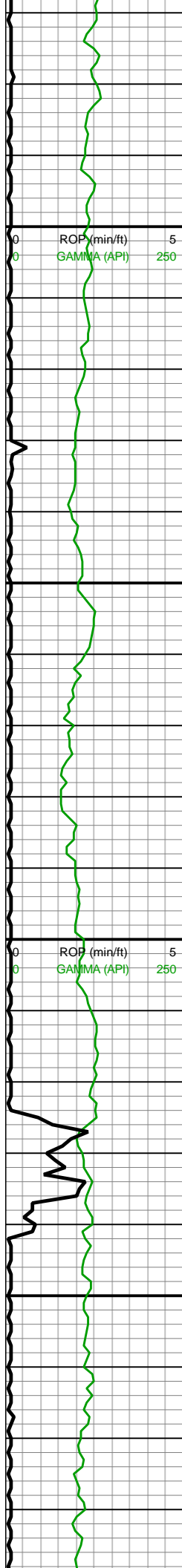
MD: 11,261'
INC: 87.63°
AZM: 270.41°
TVD: 7,118.43'
VS: 4,039.21'



11000-11100 CHK
(85%): mot med gy-med
gyshbn, blk-y-sb blk-y, sl
frm-brit, MRLST incl, sme
sm, chky, v calc; MRLST
(15%): dk gy, hd-frm, sb
blk-y, tr intbd CHK, mod
calc

11100-11200 CHK
(85%): mot lt gy-med gy,
tr med gyshbn, blk-y-sb
blk-y, sl frm-brit, MRLST
incl, sme sm, chky, v
calc; MRLST (15%): v dk
gy, hd-frm, sb blk-y, tr
intbd CHK, mod calc, tr
imbd pyr





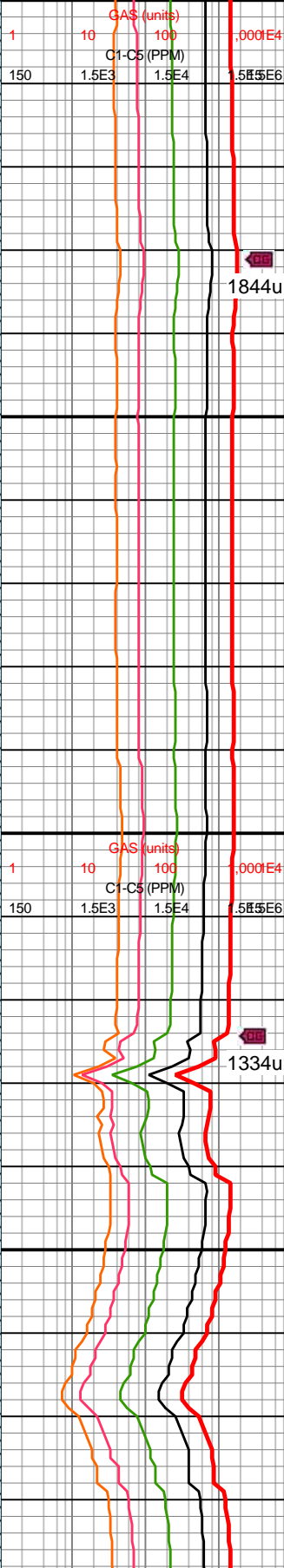
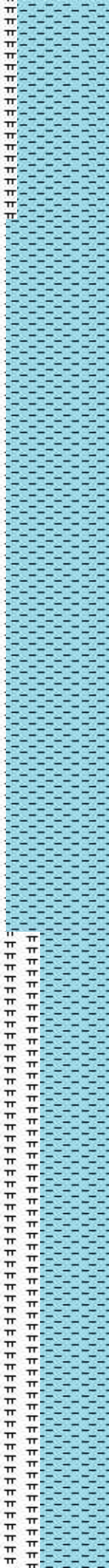
11,270
11,280
11,290
11,300
11,310
11,320
11,330
11,340
11,350
11,360
11,370
11,380
11,390
11,400
11,410
11,420
11,430
11,440
11,450
11,460
11,470
11,480

MD: 11,355'
INC: 86.44°
AZM: 270.24°
TVD: 7,123.29'
VS: 4,125.31'

WOB: 27.3klbs
RPM: 70
SPM: 188
SPP: 5,433psi

MW IN: 10.3+
VIS IN: 46
MW OUT: 10.3
VIS OUT: 44

MD: 11,450'
INC: 85.65°
AZM: 269.36°
TVD: 7,129.84'
VS: 4,211.88'

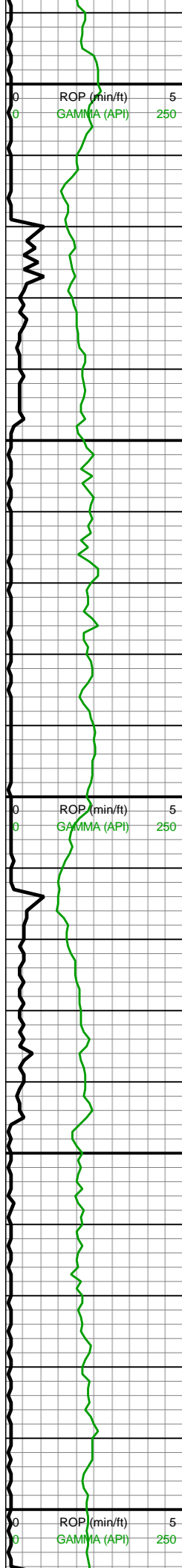


11200-11300 CHK
(80%): mot lt gy-mot med
gy, blkgy-sb blkgy, sl
frm-brit, MRLST incl, sme
sm, chky, v calc; MRLST
(20%): v dk gy-dk gy,
hd-frm, sb blkgy, tr intbd
CHK, mod calc

11300-11400 CHK
(80%): mot lt gy-mot med
gy, blkgy-sb blkgy, frm-brit,
MRLST incl, sl sm, chky,
v calc; MRLST (20%): dk
gy, mot, hd-frm, sb blkgy, tr
intbd CHK, mod calc

11400-11500 CHK
(60%): mot med gy, sme
mot lt gy, blkgy-sb blkgy,
frm-brit, MRLST incl, sl





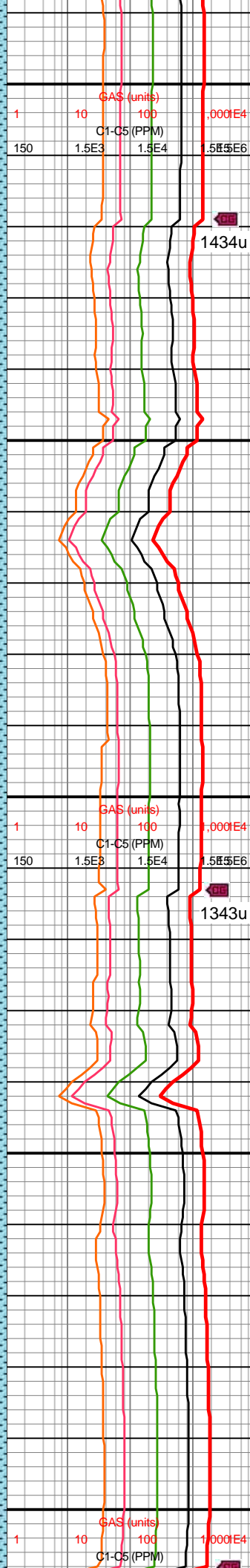
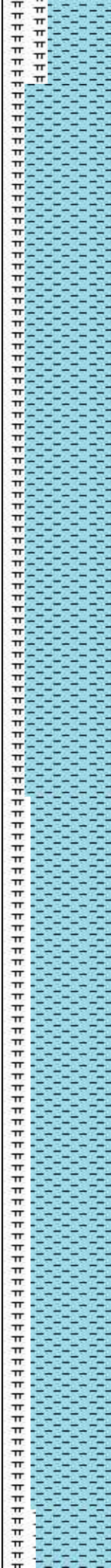
11,490
11,500
11,510
11,520
11,530
11,540
11,550
11,560
11,570
11,580
11,590
11,600
11,610
11,620
11,630
11,640
11,650
11,660
11,670
11,680
11,690
11,700

MW IN: 10.4+
VIS IN: 48
MW OUT: 10.4
VIS OUT: 44

MD: 11,544'
INC: 86.75°
AZM: 270.24°
TVD: 7,136.07'
VS: 4,297.56'

WOB: 31.8klbs
RPM: 70
SPM: 189
SPP: 5,565psi

MD: 11,639'
INC: 88.9°
AZM: 271.82°
TVD: 7,139.68'
VS: 4,385.08'

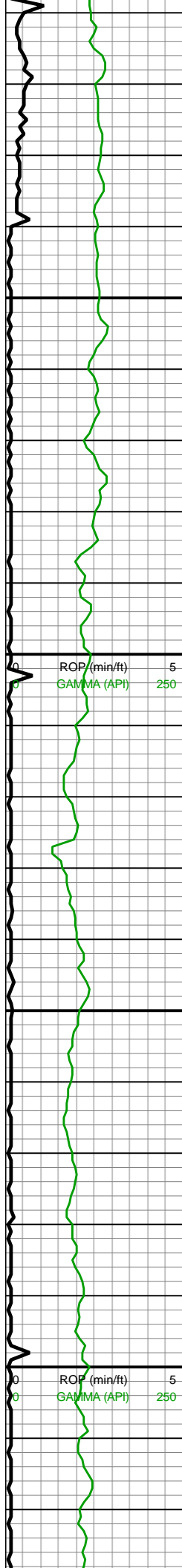


sm, chky, v calc; MRLST (40%): dk gy-v dk gy, mot, hd-frm, sb blk, tr intbd CHK, mod calc

11500-11600 CHK (80%): predy mot med gy-mot lt gy, blk-sb blk, frm-brit, MRLST incl, sl sm, chky, v calc; MRLST (20%): v dk gy-dk gy, mot, hd-frm, sb blk, tr intbd CHK, mod calc

11600-11700 CHK (75%): predy mot med gy-mot lt gy, blk-sb blk, frm-brit, MRLST incl, sl sm, chky, v calc, sme imbd cal; MRLST (25%): v dk gy, mot, hd-frm, sb blk, tr intbd CHK, mod calc





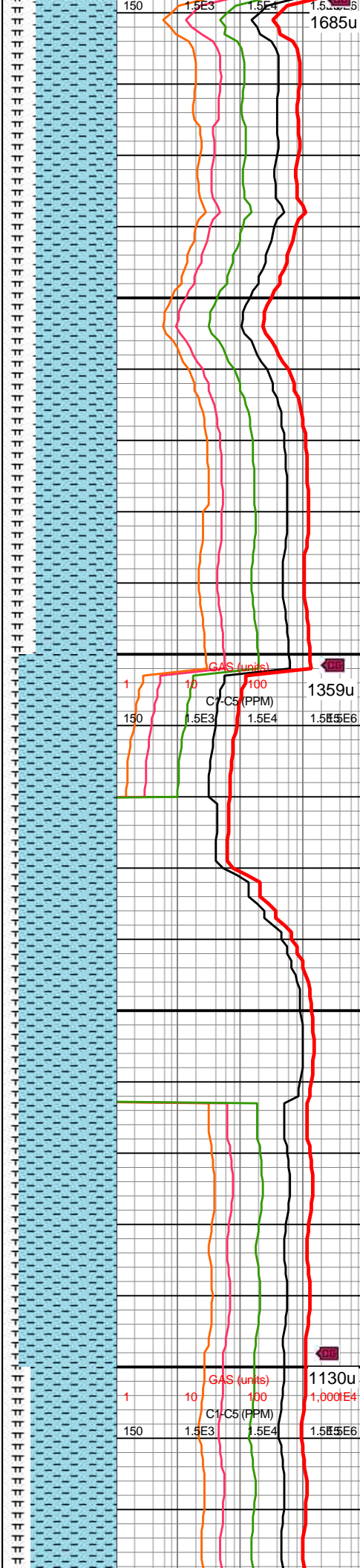
MW IN: 10.4
VIS IN: 49
MW OUT: 10.4
VIS OUT: 45

MD: 11,733'
INC: 91.54°
AZM: 271.64°
TVD: 7,139.32'
VS: 4,472.17'

WOB: 36.5klbs
RPM: 70
SPM: 188
SPP: 5,562psi

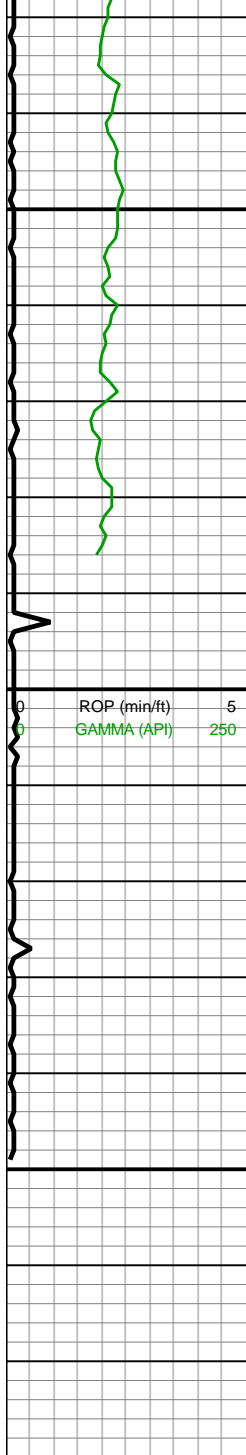
MD: 11,828'
INC: 91.27°
AZM: 270.85°
TVD: 7,136.99'
VS: 4,559.87'

MD: 11,923'
INC: 90.92°
AZM: 270.24°
TVD: 7,135.17'
VS: 4,617.10'



11700-11800 CHK
(70%): predy mot med
gy-mot lt gy, sme med
gyshbn, blkysb blkys,
frm-brit, MRLST incl, sl
sm, chky, v calc, tr imbd
cal; MRLST (30%): v dk
gy, mot, hd-frm, sb blkys, tr
intbd CHK, mod calc, tr
dissm pyr

11800-11900 CHK
(85%): predy med
gyshbn, mot med gy,
blkysb blkys, frm-brit,
MRLST incl, sl sm, chky,
v calc; MRLST (15%): dk
gy, mot, hd-frm, sb blkys, tr
intbd CHK, mod calc



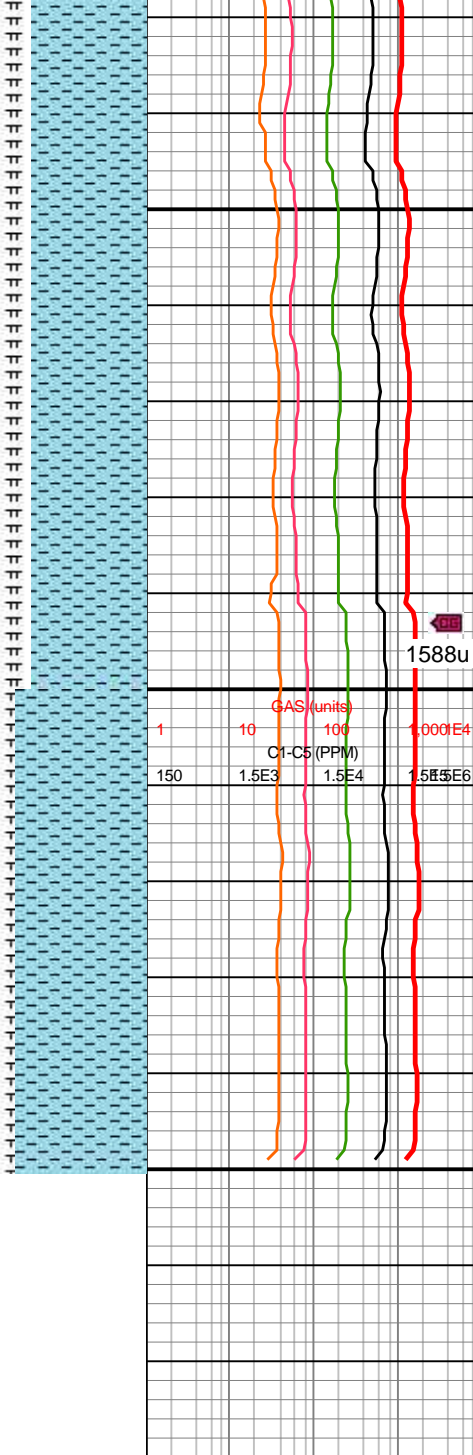
VS: 4,647.13'

MD: 11,980'
INC: 90.84°
AZM: 270.59°
TVD: 7,134.3'
VS: 4,699.44'

WOB: 35.4klbs
RPM: 70
SPM: 188
SPP: 5,560psi

Projection to Bit
MD: 12,050'
INC: 90.84°
AZM: 270.59°
TVD: 7,133.27'
VS: 4,763.76'

**Total Depth of
12,050' MD
Reached on
12/14/2018 @
23:15 MST**



11900-12000 CHK
(75%): predy mot med gy,
mot med gyshbn, blkly-sb
blkly, frm-brit, MRLST incl,
sl sm, chky, v calc;
MRLST (25%): dk gy,
mot, hd-frm, sb blkly, tr
intbd CHK, mod calc,
sme diss m pyr

12000-12050 CHK
(85%): predy mot med gy,
tr mot med gyshbn,
blkly-sb blkly, frm-brit,
MRLST incl, sl sm, chky,
v calc; MRLST (15%): dk
gy, mot, hd-frm, sb blkly, tr
intbd CHK, mod calc