



Scale: 5" / 100'
Measured Depth Log

Well Name Herren 1E-33H-H367

Location Sec. 33 T3N R67W

State Colorado

County Weld

Country USA

Rig Number Ensign 153

API Number 05-123-47727

AFE # 16191564

Geographic Region Rockies

Field Wattenberg

Spud Date 12/16/2018

Drilling Completed 12/19/2018

Surface Coordinates Latitude: 40.183241
Longitude: -104.886612

SHL: Sec: 33 Twp: 3N 67W
Footage: 765 FNL 460 FEL

Bottom Hole Coordinates Proposed BHL: Sec: 33 Twp: 3N 67W
Footages: 765 FNL 460 FWL

Ground Elevation 4,848'

K.B. Elevation 4,871'

Logged Interval 6,500' **To** 12,014'

Total Depth 12,014'

Formation Niobrara C

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

Job #: 1814RK1813

Release Date: 12/20/2018

Rock Types

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

Accessories

Fossils

ALGAE
 AMPHIPORA
 BELEMNITE
 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

E EARTHY
F FENESTRAL
F FRACTURE
X INTERCRYSTALLINE
O INTEROOLITIC
M 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

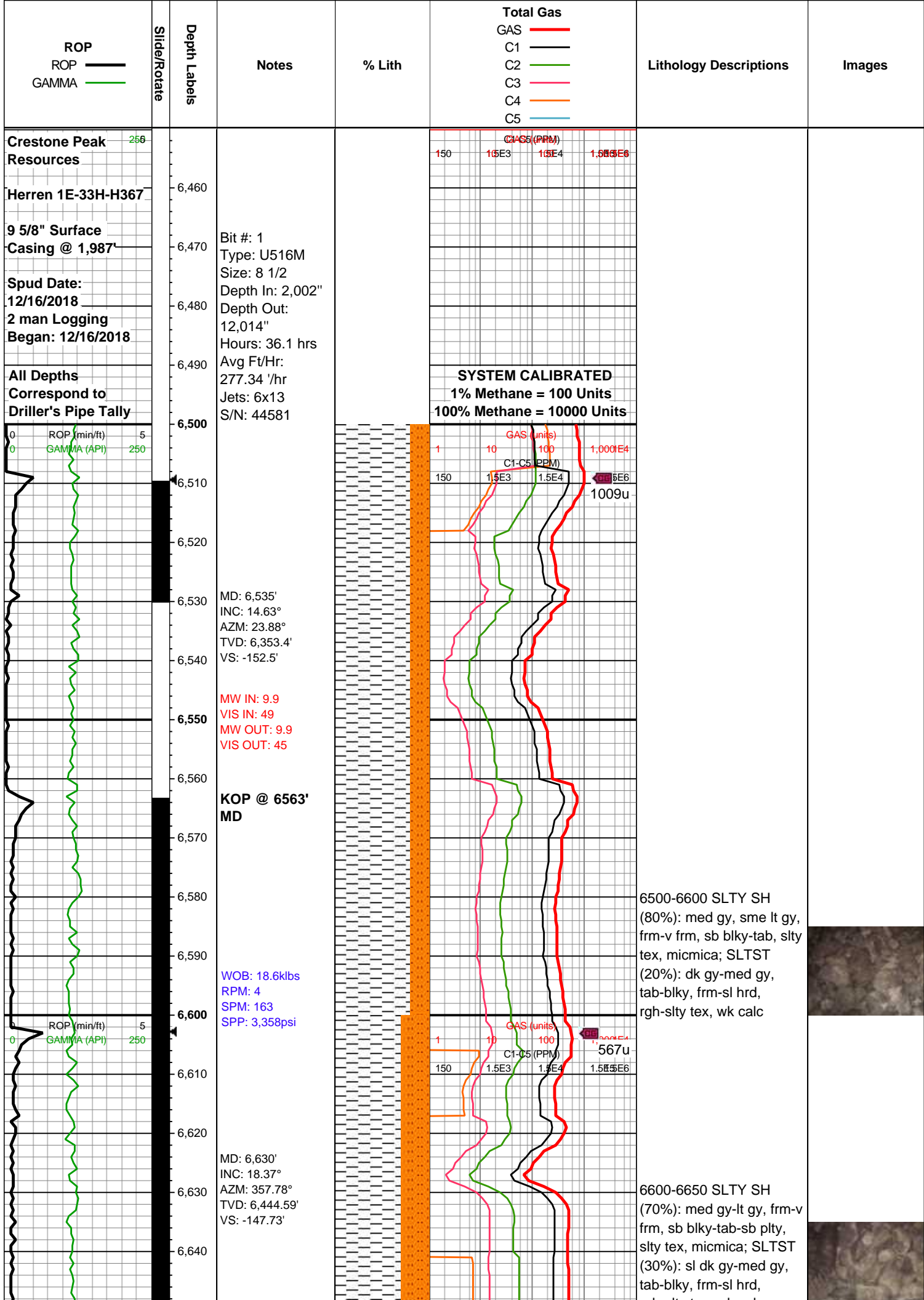
Textures

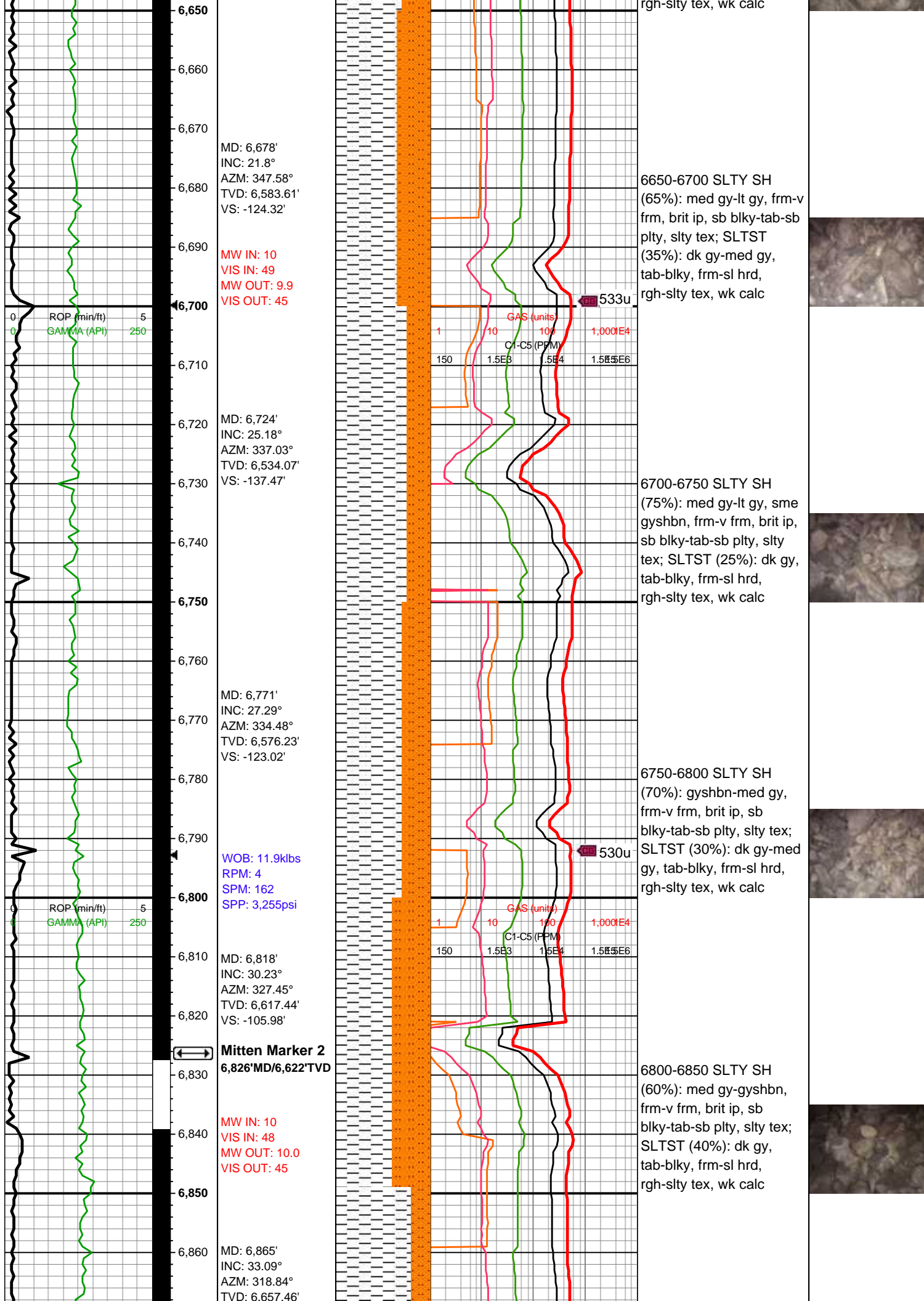
BOUNDSTONE
CHALKY
CRYPTOXLN
E EARTHY
FINELYXLN
GRAINSTONE

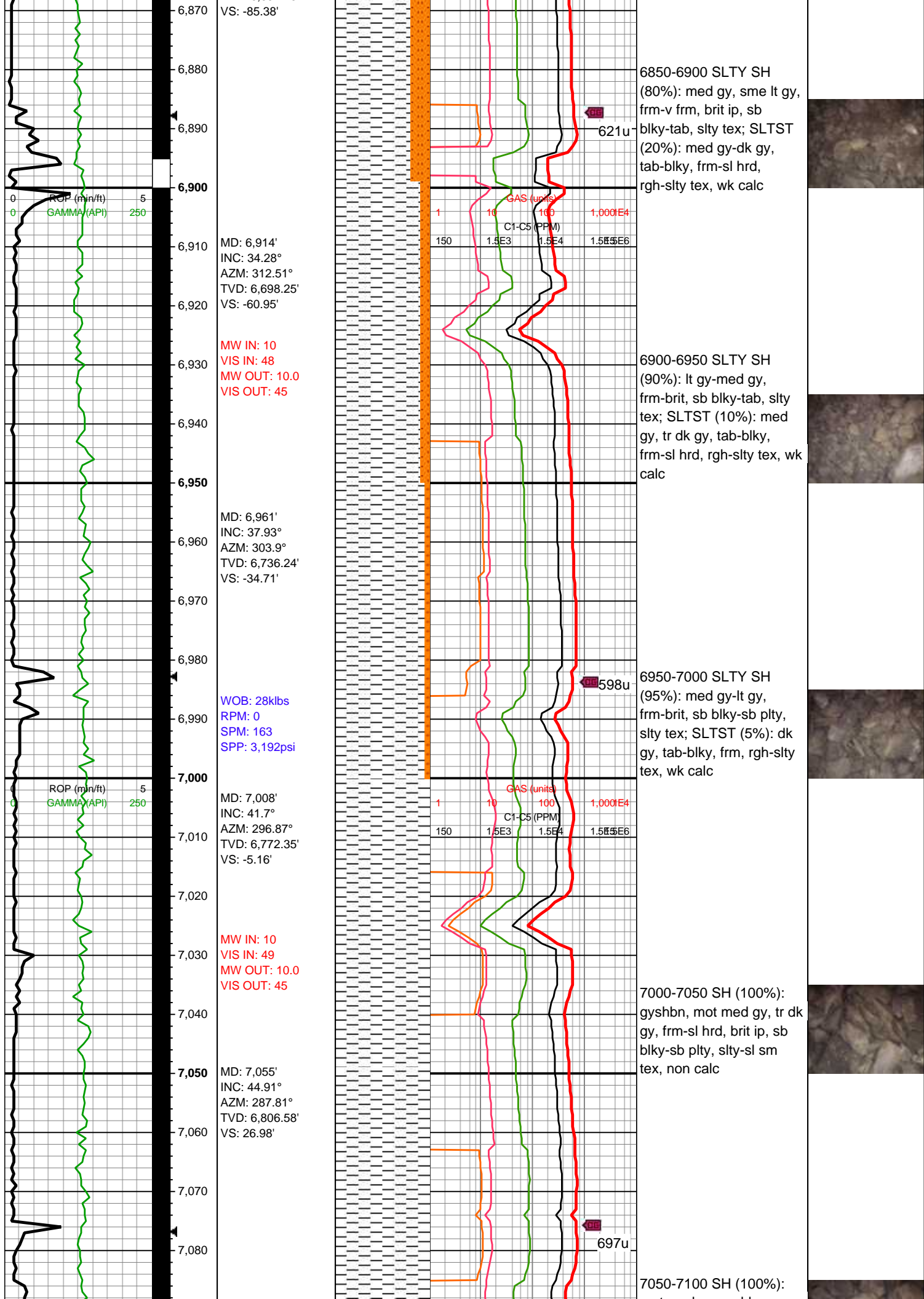
L LITHOGRAPHIC
MX MICROXLN
MS MUDSTONE
PS PACKSTONE
WS WACKESTONE

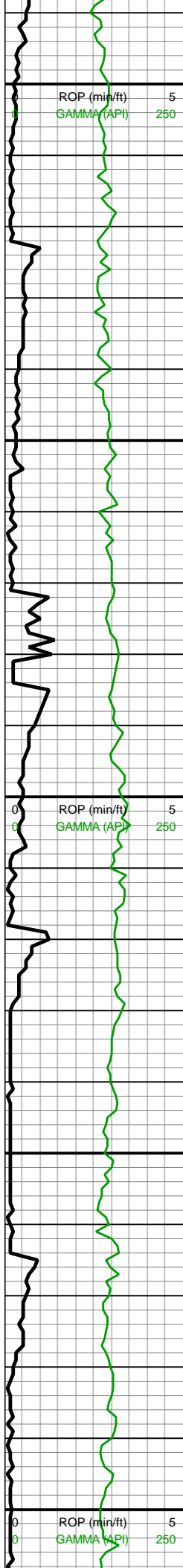
Sorting

M MODERATE
P POOR
W WELL









MD: 7,103'
INC: 47.9°
AZM: 284.74°
TVD: 6,839.68'
VS: 61.66'

MW IN: 10
VIS IN: 49
MW OUT: 10.0
VIS OUT: 46

MD: 7,150'
INC: 49.26°
AZM: 279.11°
TVD: 6,868.57'
VS: 105.18'

MD: 7,197'
INC: 50.41°
AZM: 274.81°
TVD: 6,898.9'
VS: 140.18'

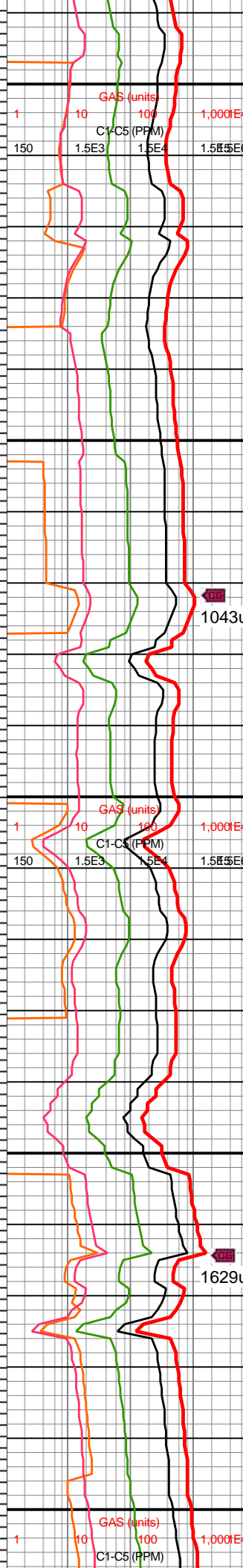
WOB: 24.1klbs
RPM: 0
SPM: 162
SPP: 3,113psi

MD: 7,244'
INC: 51.11°
AZM: 274.63°
TVD: 6,928.63'
VS: 175.32'

MW IN: 10
VIS IN: 50
MW OUT: 10.0
VIS OUT: 45

MIN DEPT 12/18/2018

MD: 7,292'
INC: 52.03°
AZM: 274.89°
TVD: 6,958.46'
VS: 211.64'



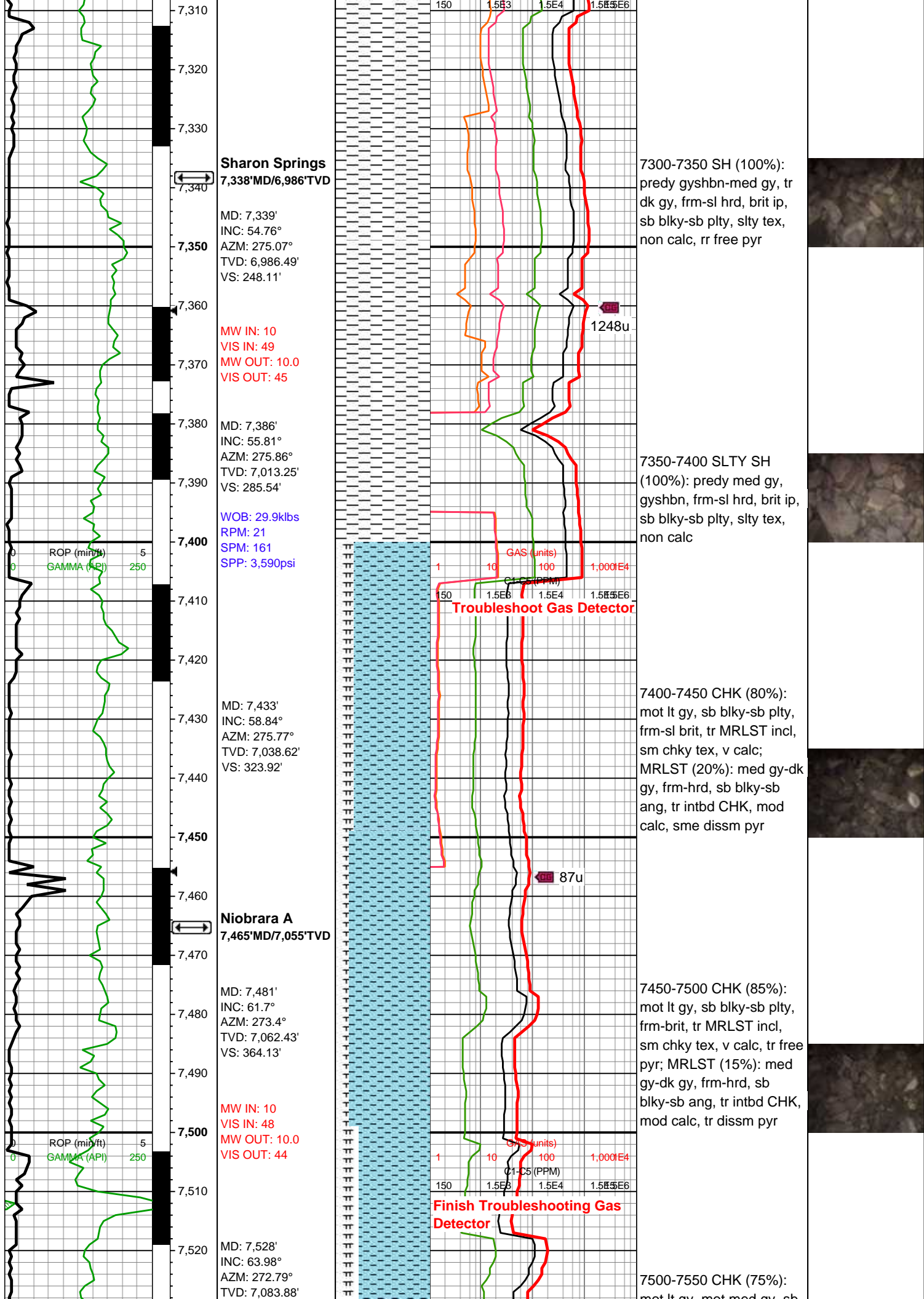
mot med gy-gyshbn, sme
dk gy, frm-sl hrd, brit ip,
sb blkly-sb plty, slty-sl sm
tex, non calc

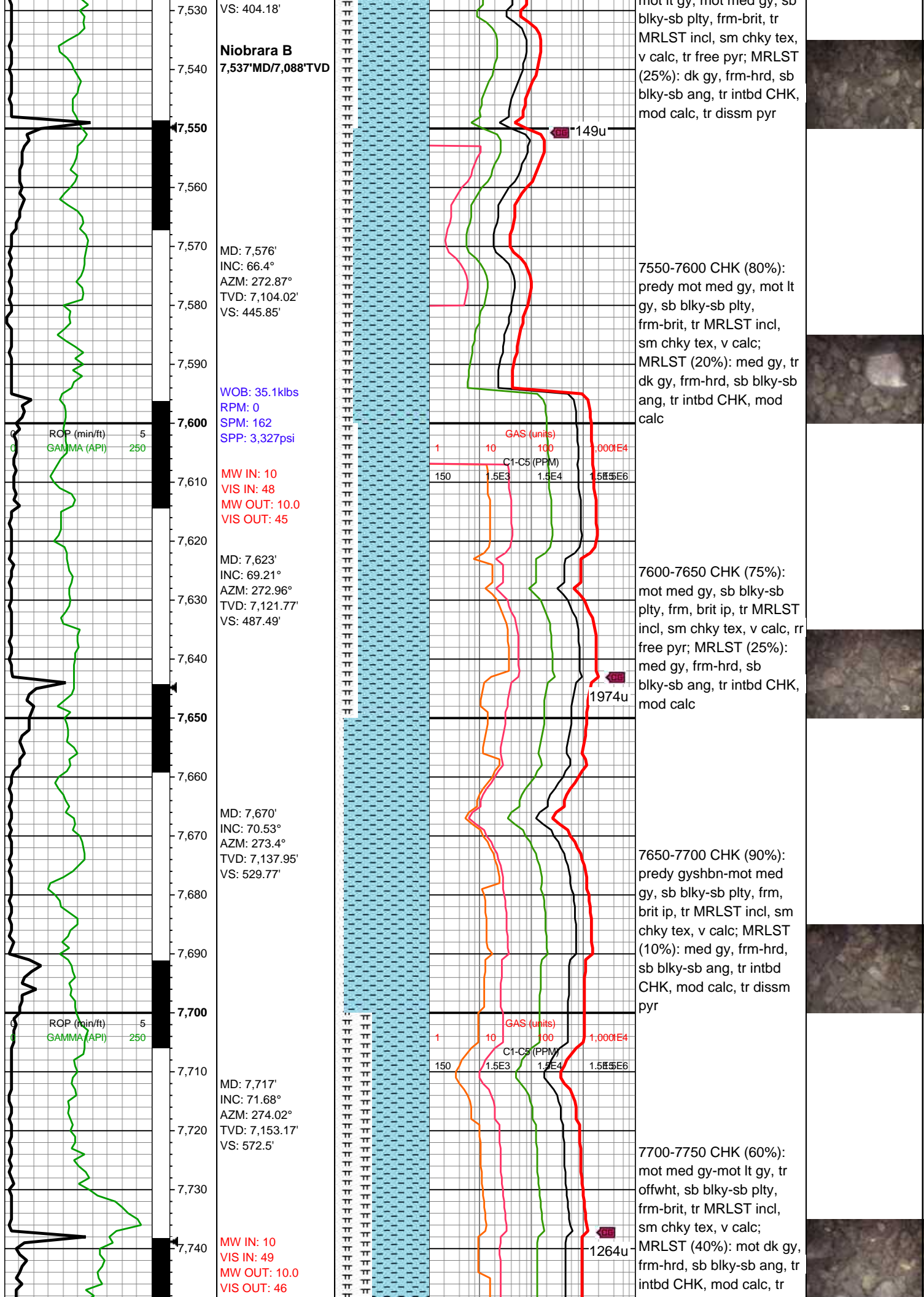
7100-7150 SH (100%):
predy med gy-gyshbn,
sme dk gy, frm-hrd, sb
blkly-sb plty, slty-sl sm
tex, non calc

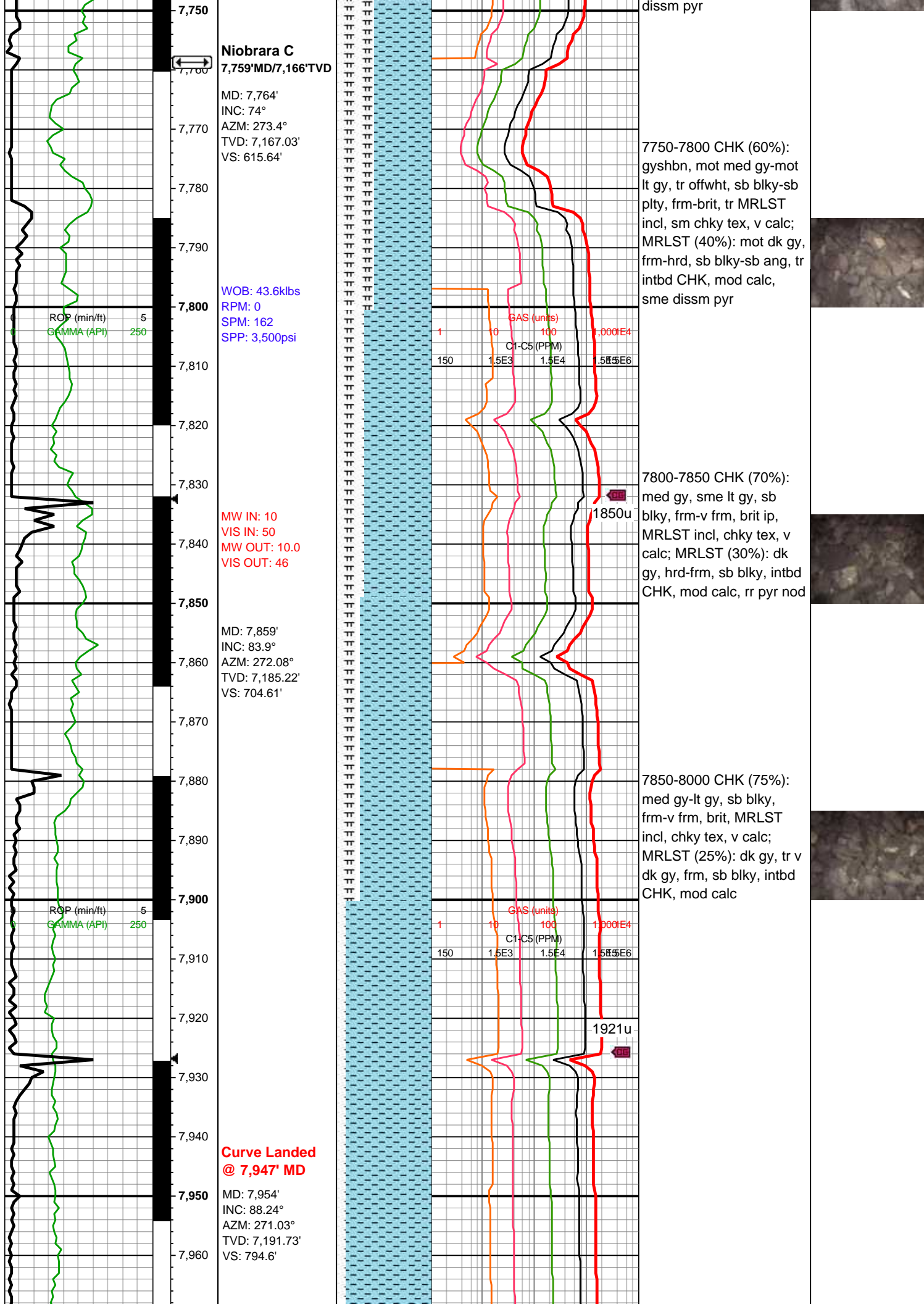
7150-7200 SH (100%):
predy gyshbn-med gy, tr
dk gy, frm-hrd, brit ip, sb
blkly-sb plty, slty-sl sm
tex, non calc

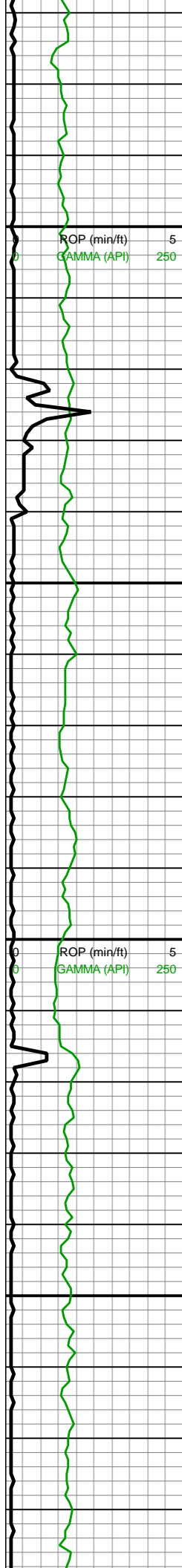
7200-7250 SH (100%):
predy gyshbn-med gy,
frm-hrd, brit ip, sb blkly-sb
plty, slty-sl sm tex, non
calc

7250-7300 SH (100%):
predy med gy, sme dk gy,
frm-sl hrd, brit ip, sb
blkly-sb plty, slty tex, non
calc









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
8,170
8,180

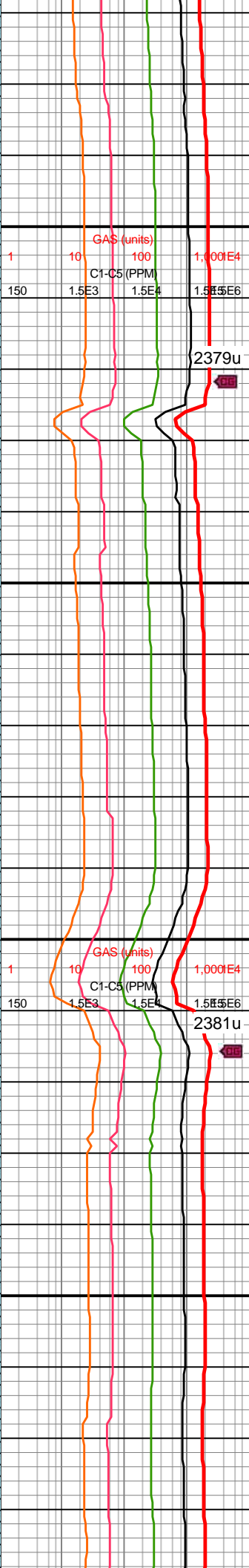
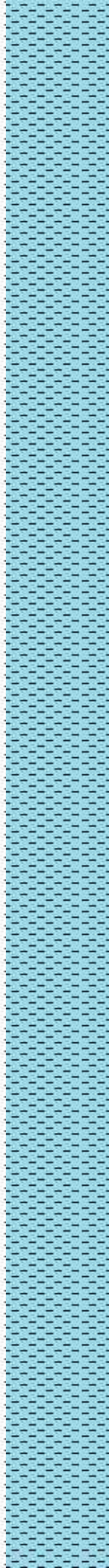
MW IN: 10
VIS IN: 50
MW OUT: 10
VIS OUT: 46

WOB: 33.9klbs
RPM: 21
SPM: 169
SPP: 3,694psi

MD: 8,048'
INC: 90.66°
AZM: 270.41°
TVD: 7,192.63'
VS: 883.43'

MD: 8,142'
INC: 90.75°
AZM: 270.06°
TVD: 7,191.47'
VS: 971.99'

MW IN: 4,910
VIS IN: 49
MW OUT: 10
VIS OUT: 46

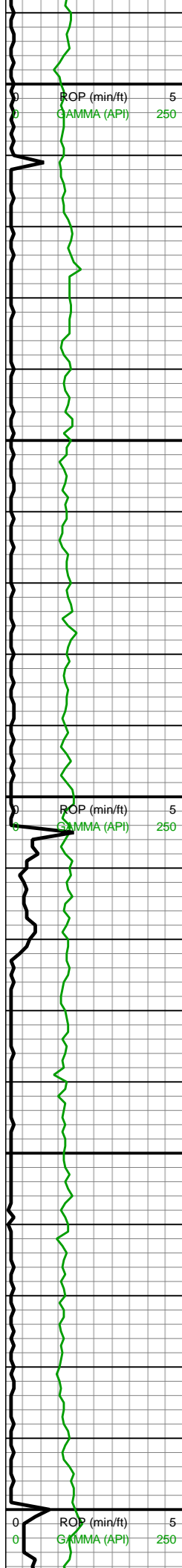


7900-8000 CHK (90%):
predy lt gy, sme mot med
gy, sb blk, frm-brit,
MRLST incl, sme v thn
MRLST lamn, sme chky
tex, v calc; MRLST (10%):
dk gy, frm, sb blk, intbd
CHK, mod calc, rr pyr nod

8000-8100 CHK (90%):
med gy, mot lt gy, sb blk,
frm-brit, MRLST incl, v thn
MRLST lamn, sme chky
tex, v calc; MRLST (10%):
dk gy, frm, sb blk, tr thn
CHK lamn, intbd CHK,
mod calc

8100-8200 CHK (90%):
med gy, mot lt gy, sb blk,
frm-brit, MRLST incl, v thn
MRLST lamn, sme chky
tex, v calc; MRLST (10%):
dk gy, frm, sb blk, intbd
CHK, mod calc, rr pyr nod



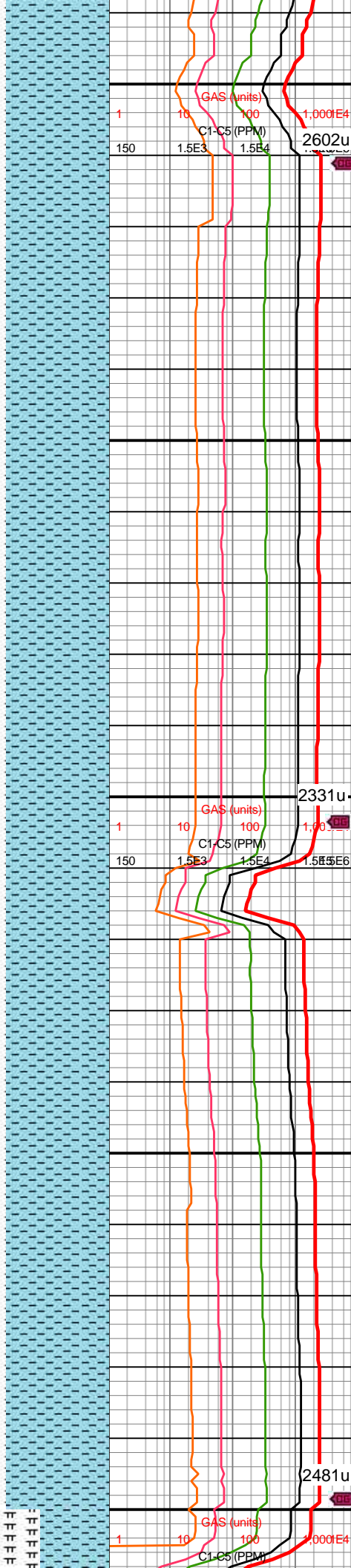


WOB: 38.1klbs
RPM: 70
SPM: 202
SPP: 5,088psi

MD: 8,237'
INC: 90.09°
AZM: 269.09°
TVD: 7,190.77'
VS: 1,061.13'

MD: 8,331'
INC: 89.96°
AZM: 269.53°
TVD: 7,190.73'
VS: 1,149.18'

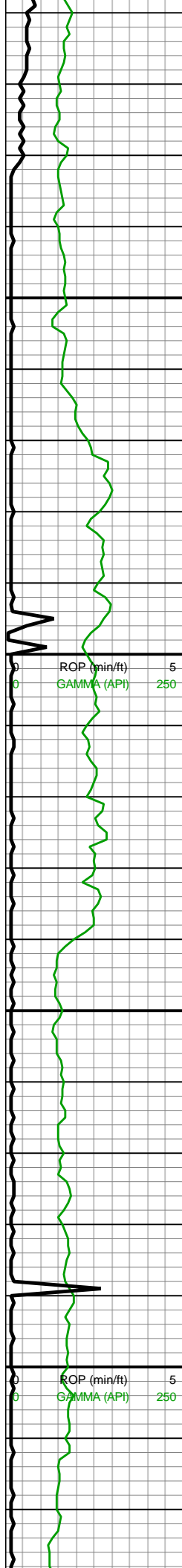
WOB: 35.6klbs
RPM: 71
SPM: 202
SPP: 5,203psi



tex, v calc; MRLST (10%):
dk gy, frm, sb blk, tr thn
CHK lamn, intbd CHK, hi
calc, tr pyr nod

8200-8300 CHK (90%):
med gy, mot lt gy, sb blk, y,
frm-brit, MRLST incl, v thn
MRLST lamn, sme chky
tex, v calc; MRLST (10%):
dk gy, frm, sb blk, rr thn
CHK lamn, intbd CHK, hi
calc, rr pyr nod

8300-8400 CHK (90%):
med gy, mot lt gy, sb blk, y,
frm-brit, MRLST incl, v thn
MRLST lamn, sme chky
tex, v calc; MRLST (10%):
dk gy, frm, sb blk, tr thn
CHK lamn, intbd CHK, hi
calc, tr pyr nod



8,410
8,420
8,430
8,440
8,450
8,460
8,470
8,480
8,490
8,500
8,510
8,520
8,530
8,540
8,550
8,560
8,570
8,580
8,590
8,600
8,610
8,620

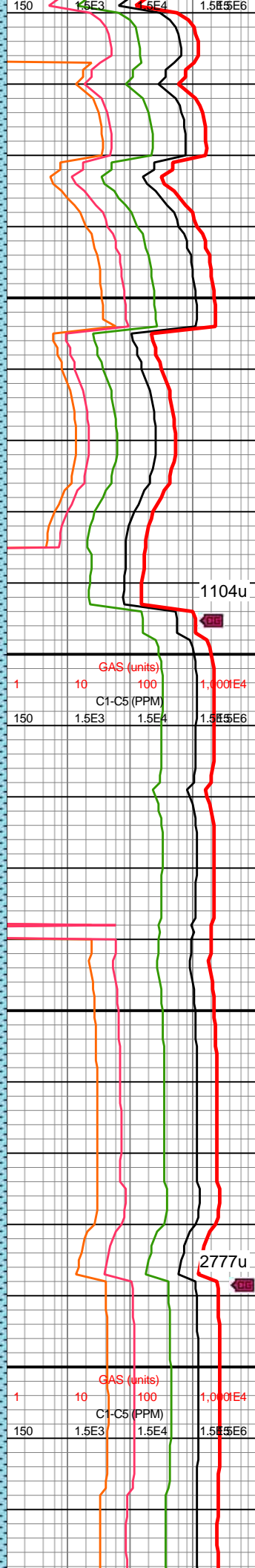
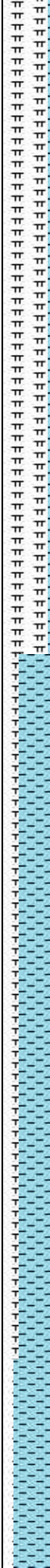
MD: 8,426'
INC: 90.53°
AZM: 272.87°
TVD: 7,190.33'
VS: 1,239.21'

MW IN: 10
VIS IN: 48
MW OUT: 10
VIS OUT: 45

MD: 8,521'
INC: 91.06°
AZM: 273.05°
TVD: 7,189.01'
VS: 1,330.12'

WOB: 32.7klbs
RPM: 71
SPM: 202
SPP: 5,097psi

MD: 8,615'
INC: 90.84°
AZM: 272.79°
TVD: 7,187.45'
VS: 1,420.06'



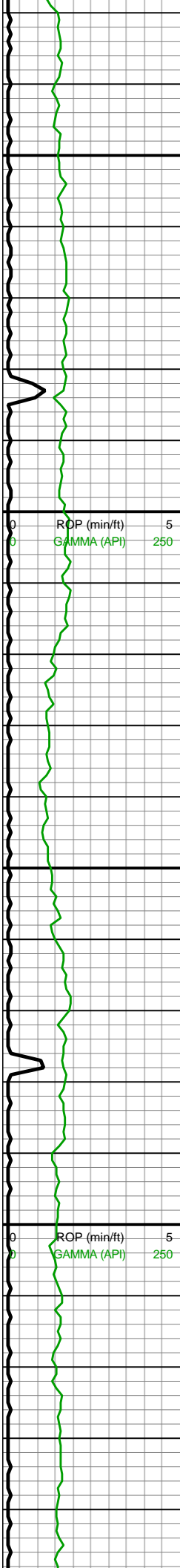
GAS (units)
C1-C5 (PPM)
1 10 100 1,000E4
150 1.5E3 1.5E4 1.5E6

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

8400-8500 CHK (60%):
gyshbn, mot med gy-mot
lt gy, tr offwht, sb blkgy-sb
plty, frm-brit, tr MRLST
incl, sm chky tex, v calc;
MRLST (40%): mot dk gy,
frm-hrd, sb blkgy-sb ang, tr
intbd CHK, mod calc,
sme dissm pyr

8500-8600 CHK (85%):
med gy, mot lt gy, sb blkgy,
frm-brit, MRLST incl, v thn
MRLST lamn, sme chky
tex, v calc; MRLST (15%):
dk gy, frm, sb blkgy, rr thn
CHK lamn, intbd CHK, hi
calc, rr pyr nod





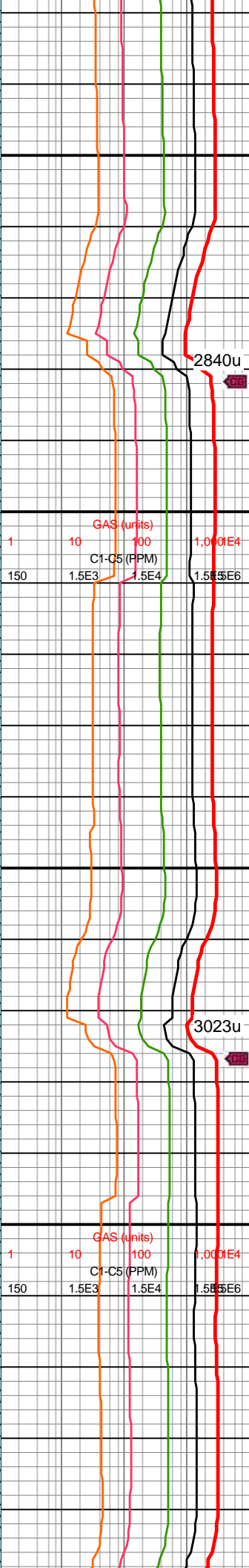
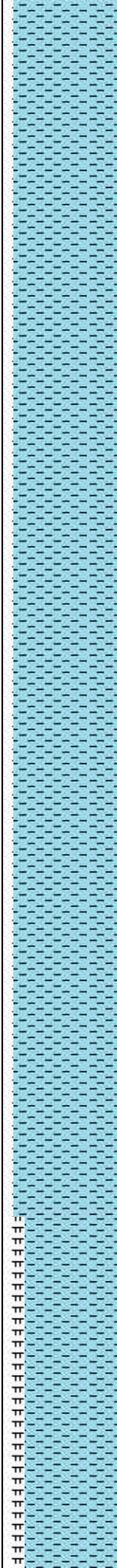
8,630
8,640
8,650
8,660
8,670
8,680
8,690
8,700
8,710
8,720
8,730
8,740
8,750
8,760
8,770
8,780
8,790
8,800
8,810
8,820
8,830
8,840

MD: 8,709'
INC: 90.97°
AZM: 272.79°
TVD: 7,185.97'
VS: 1,509.94'

MW IN: 10
VIS IN: 47
MW OUT: 10
VIS OUT: 44

WOB: 34.6klbs
RPM: 70
SPM: 201
SPP: 5,232psi

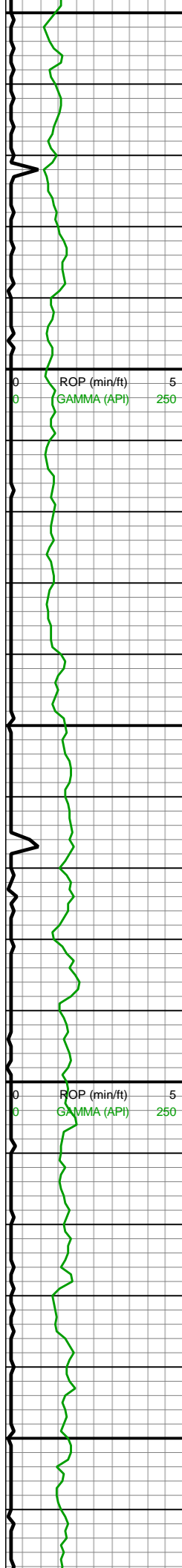
MD: 8,803'
INC: 90.62°
AZM: 272.43°
TVD: 7,184.66'
VS: 1,599.73'



8600-8700 CHK (90%):
med gy, mot lt gy, sb blk, frm-brit, MRLST incl, v thn MRLST lamn, sme chky tex, v calc; MRLST (10%): dk gy, frm, sb blk, tr thn CHK lamn, intbd CHK, hi calc, tr pyr nod

8700-8800 CHK (90%):
med gy, mot lt gy, sb blk, frm-brit, MRLST incl, sme chky tex, v calc; MRLST (10%): dk gy, frm, sb blk, tr thn CHK lamn, intbd CHK, hi calc, rr pyr nod





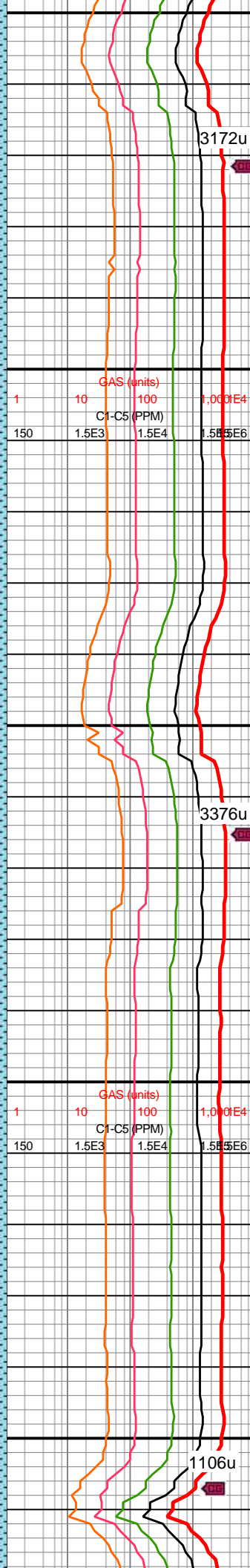
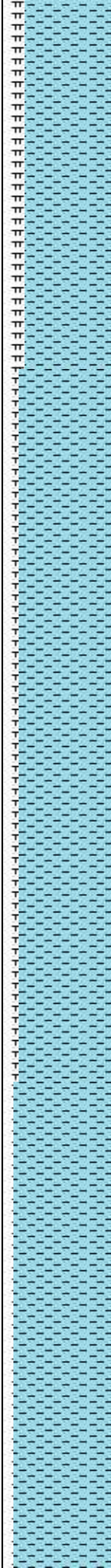
8,850
8,860
8,870
8,880
8,890
8,900
8,910
8,920
8,930
8,940
8,950
8,960
8,970
8,980
8,990
9,000
9,010
9,020
9,030
9,040
9,050
9,060

MD: 8,898'
INC: 90.62°
AZM: 271.99°
TVD: 7,183.63'
VS: 1,690.28'

MW IN: 10
VIS IN: 47
MW OUT: 10
VIS OUT: 44

MD: 8,992'
INC: 90.84°
AZM: 271.99°
TVD: 7,182.44'
VS: 1,779.77'

WOB: 35.9klbs
RPM: 71
SPM: 202
SPP: 5,255psi



3172u



8800-8900 CHK (80%): lt gy-offwht-sme mot med gy, blk-y-sb blk-y, frm-brit, sme v thn MRLST lamn, sme chky, v calc; MRLST (20%): predy dk gy, hd-frm, sb blk-y, sme CHK intbds, mod-hi cal

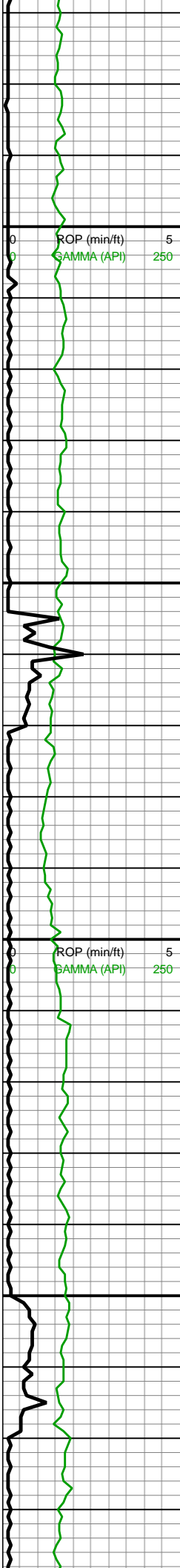
3376u



8900-9000 CHK (80%): lt gy-mot med gy, blk-y-sb blk-y, frm-brit, sme v thn MRLST lamn, sme chky, v calc; MRLST (20%): predy dk gy, hd-frm, sb blk-y, sme CHK intbds, mod-hi cal

1106u





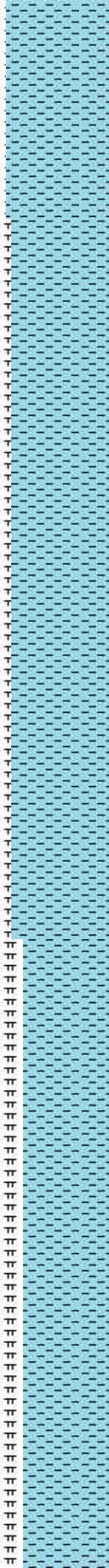
MD: 9,087'
INC: 90.18°
AZM: 271.29°
TVD: 7,181.59'
VS: 1,870.03'

MD: 9,181'
INC: 90.31°
AZM: 272.17°
TVD: 7,181.19'
VS: 1,959.4'

WOB: 32.3klbs
RPM: 70
SPM: 175
SPP: 4,166psi

MW IN: 10
VIS IN: 46
MW OUT: 10
VIS OUT: 44

MD: 9,276'
INC: 90.31°
AZM: 274.28°
TVD: 7,180.67'
VS: 2,050.44'

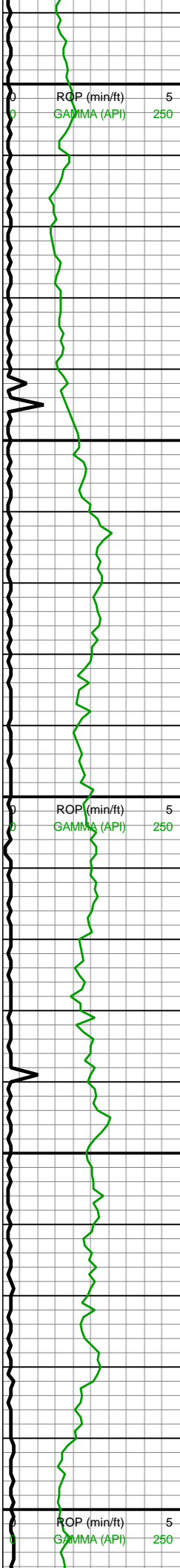


9000-9100 CHK (90%): lt
gy-mot med gy, blk-y-sb
blk-y, frm-brit, tr v thn
MRLST lamn, sme chky,
v calc; MRLST (10%):
predy dk gy, hd-frm, sb
blk-y, tr CHK intbds,
mod-hi cal

9100-9200 CHK (85%): lt
gy-mot med gy, blk-y-sb
blk-y, frm-brit, tr v thn
MRLST lamn, chky, v
calc; MRLST (15%):
predy dk gy, hd-frm, sb
blk-y, tr CHK intbds, hi cal

9200-9300 CHK (75%): lt
gy-mot med gy, sme off
wht, blk-y-sb blk-y, frm-brit,
tr v thn MRLST lamn,





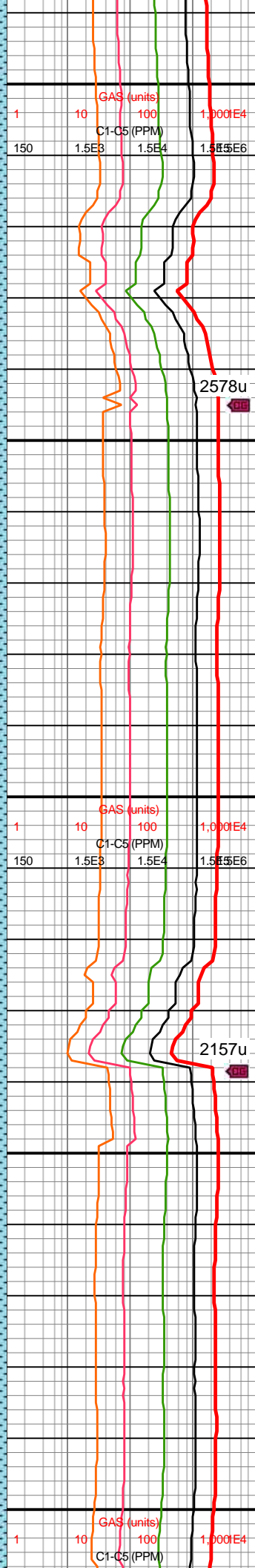
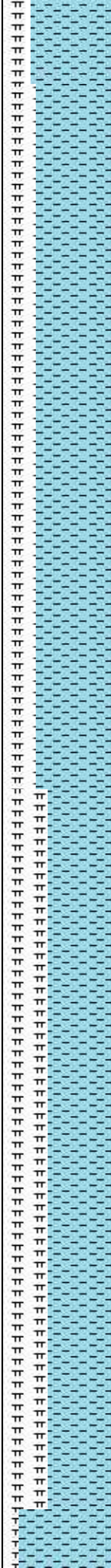
9,290
9,300
9,310
9,320
9,330
9,340
9,350
9,360
9,370
9,380
9,390
9,400
9,410
9,420
9,430
9,440
9,450
9,460
9,470
9,480
9,490
9,500

MD: 9,370'
INC: 90.57°
AZM: 273.93°
TVD: 7,179.95'
VS: 2,140.94'

WOB: 34.8klbs
RPM: 70
SPM: 174
SPP: 4,188psi

MW IN: 10
VIS IN: 46
MW OUT: 10
VIS OUT: 44

MD: 9,465'
INC: 90.75°
AZM: 273.75°
TVD: 7,178.86'
VS: 2,232.27'

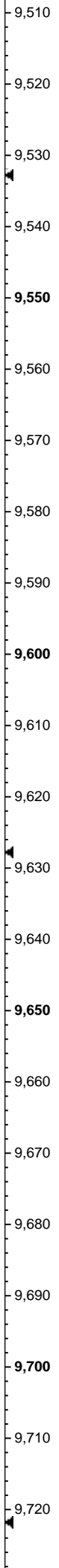
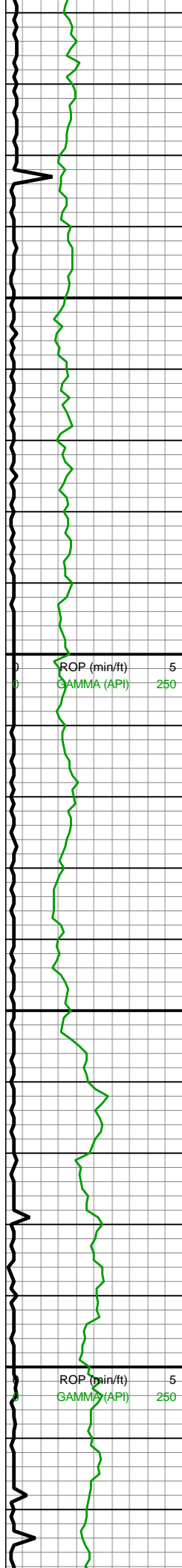


chky, v calc; MRLST (25%): predy dk gy, hd-frm, sb blk, tr CHK intbds, hi cal, rr pp pyr

9300-9400 CHK (70%): predy lt gy-mot med gy, blk-sb blk, frm-brit, sme v thn MRLST lamn, chky tex, v calc; MRLST (30%): predy dk gy, hd-frm, sb blk, com CHK intbds, mod-hi cal, tr pp mic pyr

9400-9500 CHK (60%): predy lt gy-mot med gy, blk-sb blk, frm-brit, sme v thn MRLST lamn, chky tex, v calc; MRLST (40%): predy dk gy, hd-frm, sb blk, occ CHK intbds, mod-hi cal, scat pp mic pyr



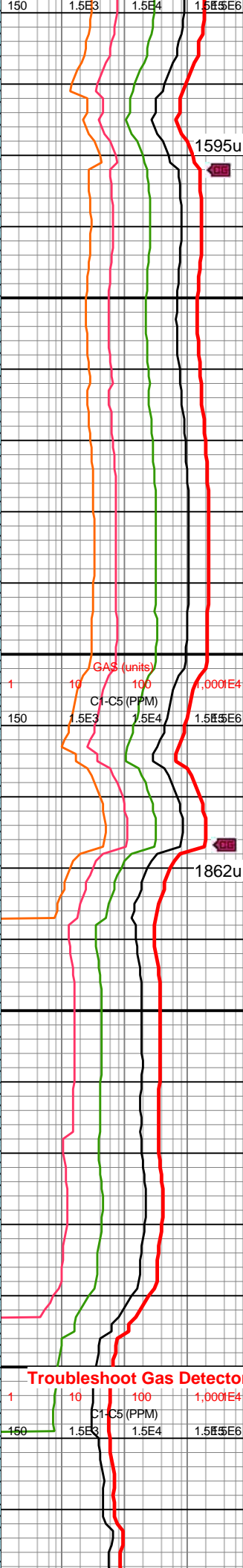
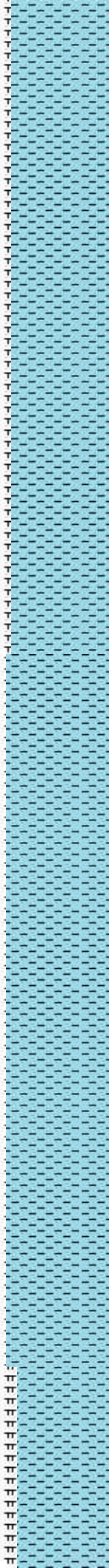


MD: 9,559'
INC: 91.1°
AZM: 273.49°
TVD: 7,177.34'
VS: 2,322.53'

WOB: 4klbs
RPM: 70
SPM: 176
SPP: 4,311psi

MW IN: 10
VIS IN: 46
MW OUT: 10
VIS OUT: 44

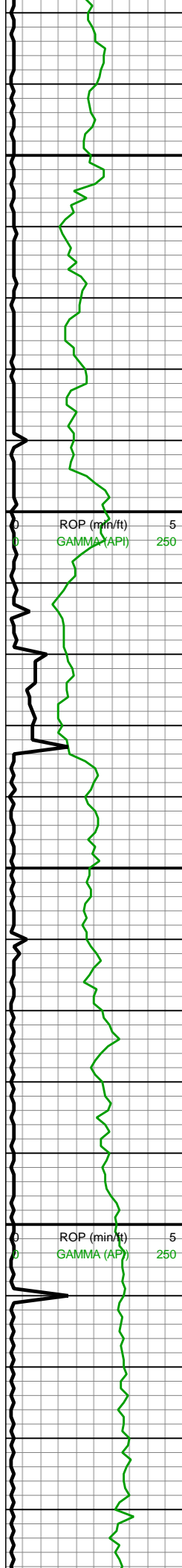
MD: 9,653'
INC: 91.41°
AZM: 273.05°
TVD: 7,175.28'
VS: 2,412.63'



9500-9600 CHK (85%):
med gy, mot lt gy, sb blk, y,
frm-brit, MRLST incl, v thn
MRLST lamn, sme chky
tex, v calc; MRLST (15%):
dk gy, frm, sb blk, y, rr thn
CHK lamn, intbd CHK, hi
calc, rr pyr nod

9600-9700 CHK (90%):
med gy, mot lt gy, sb blk, y,
frm-brit, MRLST incl, v thn
MRLST lamn, sme chky
tex, v calc; MRLST (10%):
dk gy, frm, sb blk, y, tr thn
CHK lamn, intbd CHK, hi
calc, tr pyr nod





MD: 9,748'
INC: 92.02°
AZM: 272.87°
TVD: 7,172.44'
VS: 2,503.51'

WOB: 33.1klbs
RPM: 70
SPM: 174
SPP: 4,264psi

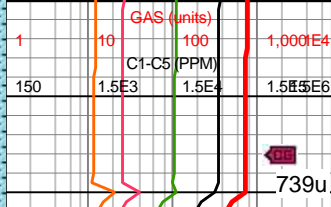
MW IN: 10
VIS IN: 45
MW OUT: 10
VIS OUT: 43

MD: 9,842'
INC: 90.84°
AZM: 273.05°
TVD: 7,170.09'
VS: 2,593.45'

MD: 9,937'
INC: 91.01°
AZM: 273.84°
TVD: 7,168.56'
VS: 2,684.59'

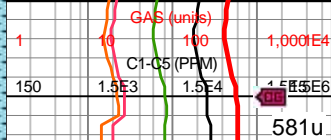
Finsih Troubleshooting Gas
Detector

9700-9800 CHK (80%):
med gy, mot lt gy, sb blk, y,
frm-brit, MRLST incl, v thn
MRLST lamn, sme chky
tex, v calc; MRLST (20%):
dk gy, frm, sb blk, y, tr thn
CHK lamn, intbd CHK, hi
calc, tr pyr nod

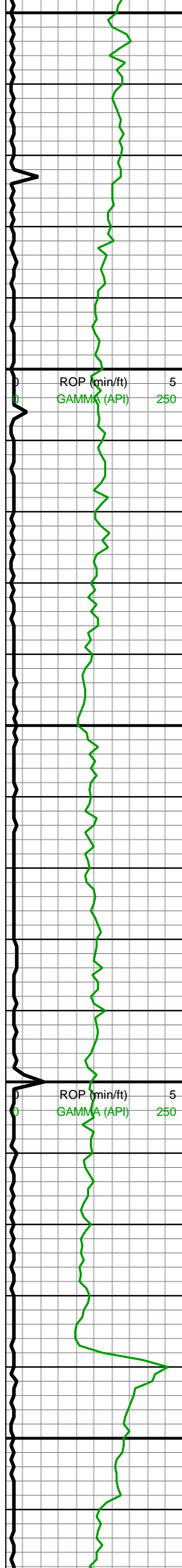


739u

9800-9900 MRLST
(55%): dk gy-med gy, frm,
sb blk, y, tr thn CHK lamn,
intbd CHK, hi calc; CHK
(45%): med gy, mot lt gy,
sme gysbhn, sb blk, y,
frm-brit, MRLST incl, v thn
MRLST lamn, sme chky
tex, v calc



581u



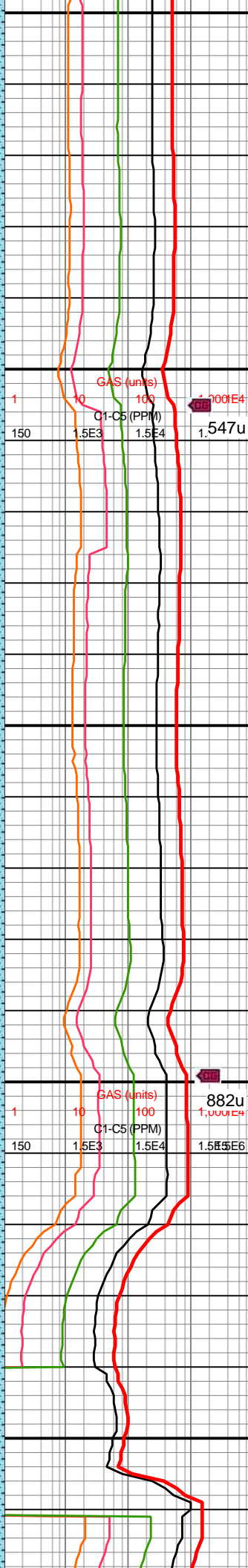
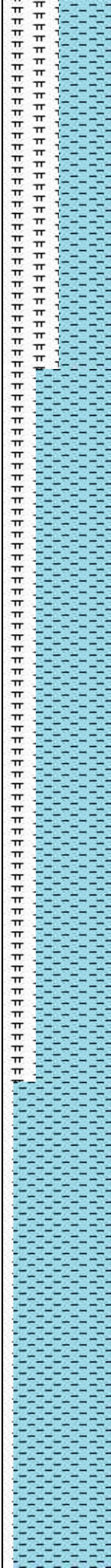
9,950
9,960
9,970
9,980
9,990
10,000
10,010
10,020
10,030
10,040
10,050
10,060
10,070
10,080
10,090
10,100
10,110
10,120
10,130
10,140
10,150
10,160

MW IN: 10
VIS IN: 45
MW OUT: 10
VIS OUT: 43

WOB: 36klbs
RPM: 70
SPM: 197
SPP: 5,235psi

MD: 10,031'
INC: 90.7°
AZM: 273.93°
TVD: 7,167.16'
VS: 2,774.98'

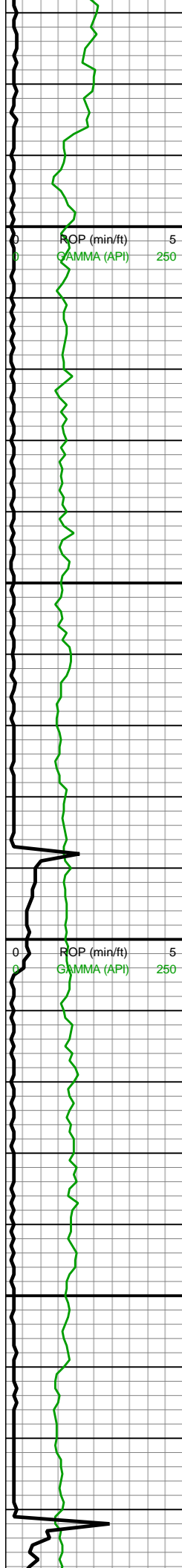
MD: 10,125'
INC: 90.26°
AZM: 273.58°
TVD: 7,166.37'
VS: 2,865.31'



9900-10000 MRLST
(50%): dk gy, frm, sb blk, tr thn CHK lamn, intbd CHK, hi calc; CHK (50%): mot lt gy, sme gyshbn, sb blk, frm-brit, MRLST incl, v thn MRLST lamn, sme chky tex, v calc

10000-10100 CHK
(70%): mot lt gy, sme gyshbn, tr offwht, sb blk, frm-brit, MRLST incl, v thn MRLST lamn, sme chky tex, v calc; MRLST (30%): dk gy, frm, sb blk, tr thn CHK lamn, intbd CHK, hi calc





10,170
10,180
10,190
10,200
10,210
10,220
10,230
10,240
10,250
10,260
10,270
10,280
10,290
10,300
10,310
10,320
10,330
10,340
10,350
10,360
10,370
10,380

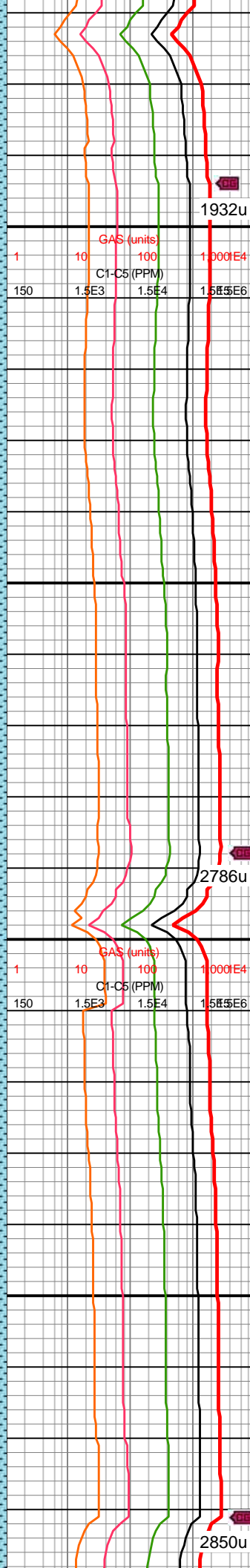
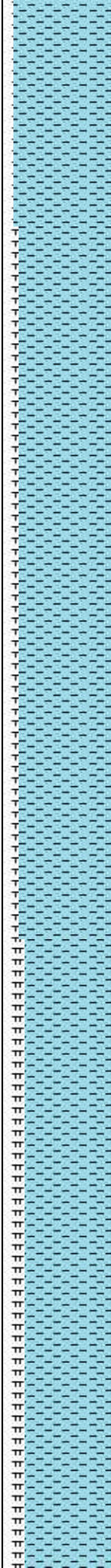
MW IN: 10
VIS IN: 45
MW OUT: 10
VIS OUT: 43

WOB: 34.2klbs
RPM: 70
SPM: 194
SPP: 5,039psi

MD: 10,220'
INC: 89.82°
AZM: 273.49°
TVD: 7,166.3'
VS: 2,956.51'

MW IN: 10
VIS IN: 46
MW OUT: 10
VIS OUT: 44

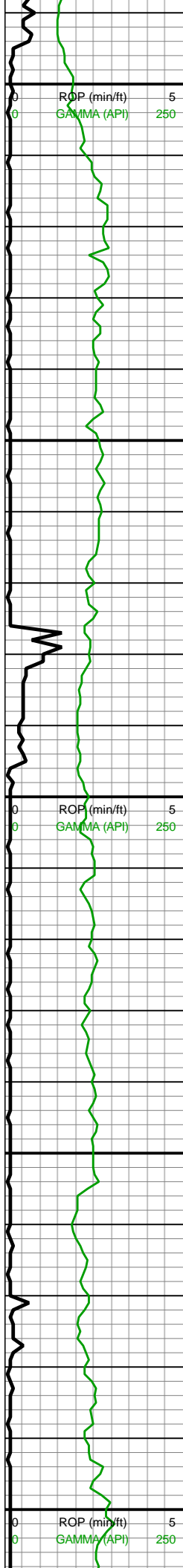
MD: 10,314'
INC: 90.13°
AZM: 271.29°
TVD: 7,166.34'
VS: 3,046.2'



10100-10200 CHK
(90%): predy mot lt
gy-gyshbn, sb blkly,
frm-brit, MRLST incl, v thn
MRLST lamn, sme chky
tex, v calc; MRLST (30%):
med gy-dk gy, frm, sb
blkly, tr thn CHK lamn,
intbd CHK, hi calc, tr free
pyr

10200-10300 CHK
(85%): predy mot med
gy-mot lt gy, sme offwht,
sb blkly, frm-brit, MRLST
incl, v thn MRLST lamn,
sme chky tex, v calc;
MRLST (15%): dk gy, frm,
sb blkly, tr thn CHK lamn,
intbd CHK, hi calc, rr free
pyr

10300-10400 CHK
(80%): predy mot
gyshbn-mot lt gy, tr
offwht, sb blkly, frm-brit,
MRLST incl, v thn MRLST
lamn, sme chky tex, v



WOB: 24.2klbs
RPM: 70
SPM: 195
SPP: 5,157psi

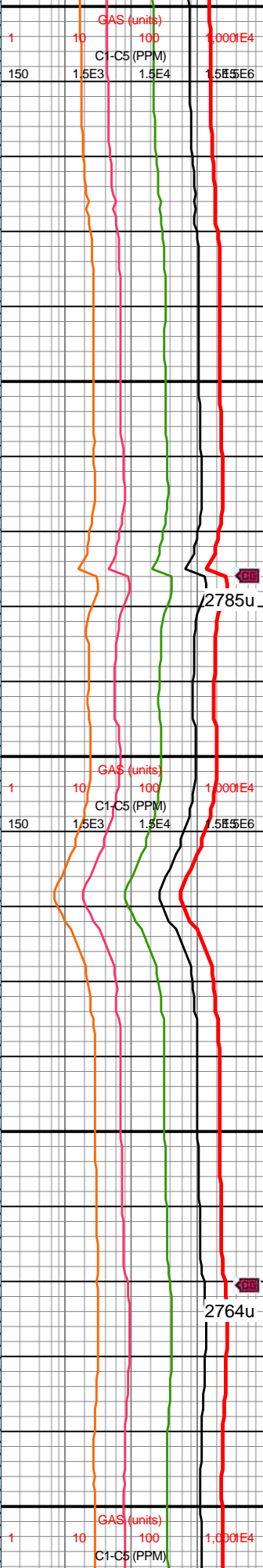
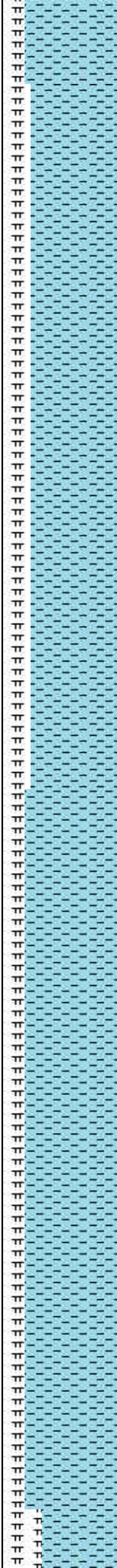
MD: 10,414'
INC: 90.35°
AZM: 269.71°
TVD: 7,165.92'
VS: 3,140.58'

MW IN: 10
VIS IN: 46
MW OUT: 10+
VIS OUT: 44

MD: 10,503'
INC: 89.25°
AZM: 267.78°
TVD: 7,166.24'
VS: 3,223.63'

MD: 10,597'
INC: 89.52°
AZM: 267.51°
TVD: 7,167.24'
VS: 3,310.68'

WOB: 35.3klbs

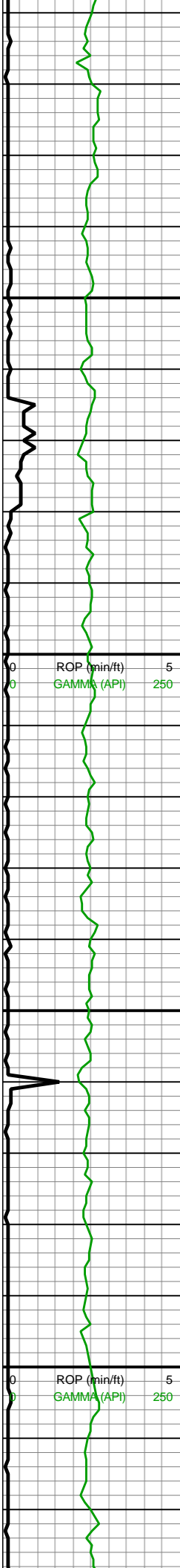


calc; MRLST (20%): med
gy, tr dk gy, frm, sb blk, tr
thn CHK lamn, intbd
CHK, hi calc

10400-10500 CHK
(75%): mot gyshbn-mot lt
gy, sb blk, frm-brit,
MRLST incl, v thn MRLST
lamn, sme chky tex, v
calc; MRLST (15%): med
gy-dk gy, frm, sb blk, tr
thn CHK lamn, intbd
CHK, hi calc

10500-10600 CHK
(80%): mot med gy-mot lt
gy, sb blk, frm-brit,
MRLST incl, v thn MRLST
lamn, sme chky tex, v
calc; MRLST (20%): dk
gy, frm, sb blk, tr thn
CHK lamn, intbd CHK, hi
calc, sme free pyr





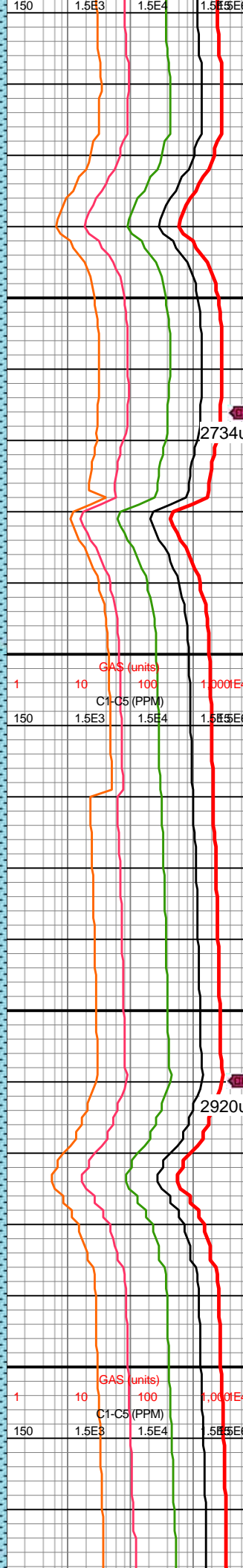
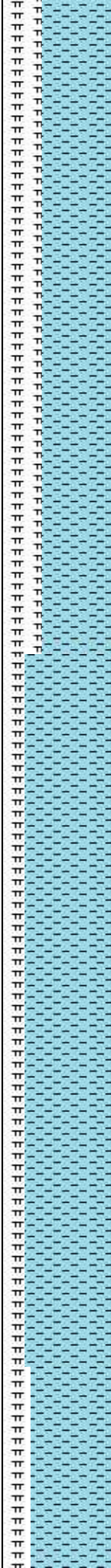
RPM: 70
SPM: 195
SPP: 5,463psi

MW IN: 10.1
VIS IN: 47
MW OUT: 10.1
VIS OUT: 44

MD: 10,692'
INC: 88.42°
AZM: 266.46°
TVD: 7,168.95'
VS: 3,398.23'

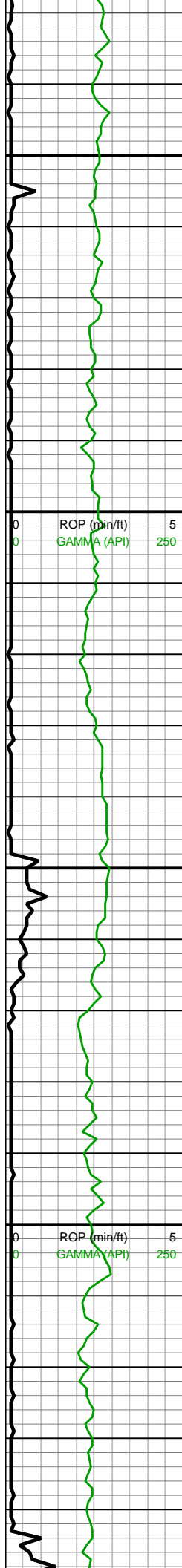
MD: 10,787'
INC: 88.9°
AZM: 266.19°
TVD: 7,171.17'
VS: 3,485.35'

WOB: 34.9klbs
RPM: 70
SPM: 194
SPP: 5,503psi



10600-10700 CHK
(65%): mot dk med gy,
sme mot lt gy, sb blk,
frm-brit, MRLST incl, v thn
MRLST lamn, sme chky
tex, v calc; MRLST (35%):
dk gy, frm, sb blk, tr thn
CHK lamn, intbd CHK, hi
calc, tr free pyr

10700-10800 CHK
(80%): mot lt gy-mot med
gy, sb blk, frm-brit,
MRLST incl, v thn MRLST
lamn, sme chky tex, v
calc; MRLST (20%): v dk
gy, frm, sb blk, tr thn
CHK lamn, intbd CHK, hi
calc



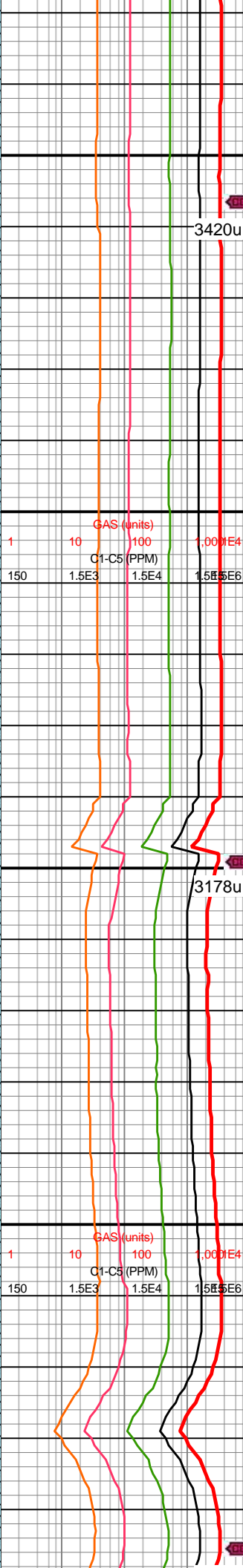
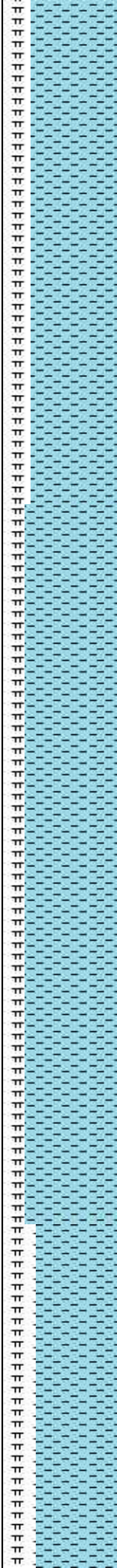
10,830
10,840
10,850
10,860
10,870
10,880
10,890
10,900
10,910
10,920
10,930
10,940
10,950
10,960
10,970
10,980
10,990
11,000
11,010
11,020
11,030
11,040

MD: 10,881'
INC: 88.73°
AZM: 265.23°
TVD: 7,173.12'
VS: 3,571.14'

MW IN: 10.1+
VIS IN: 46
MW OUT: 10.1+
VIS OUT: 44

MD: 10,976'
INC: 87.76°
AZM: 266.98°
TVD: 7,176.03'
VS: 3,658.09'

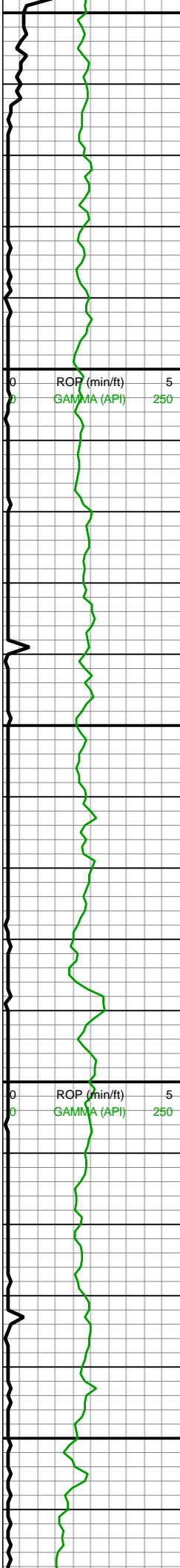
WOB: 37.5klbs
RPM: 70
SPM: 193
SPP: 5,506psi



10800-10900 CHK
(75%): predy mot med
gy-mot lt gy, sb blk,
frm-brit, MRLST incl, v thn
MRLST lamn, sme chky
tex, v calc; MRLST (25%):
v dk gy-dk gy, frm, sb blk,
tr thn CHK lamn, intbd
CHK, hi calc

10900-11000 CHK
(80%): mot med gy, sme
mot lt gy, sb blk, frm-brit,
MRLST incl, v thn MRLST
lamn, sme chky tex, v
calc; MRLST (20%): v dk
gy, frm, sb blk, v thn
CHK lamn, intbd CHK, hi
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

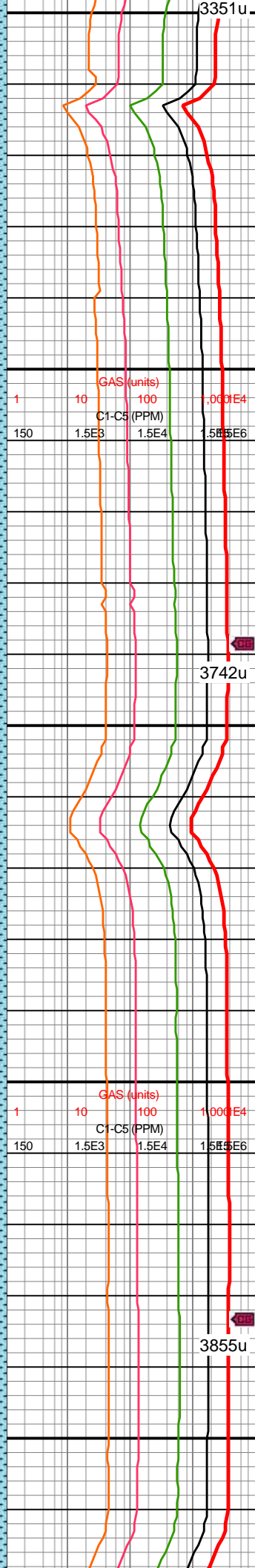
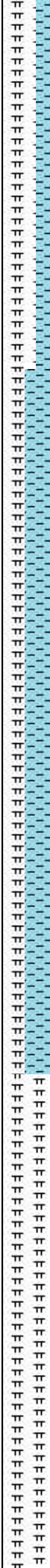
MD: 11,071'
INC: 89.69°
AZM: 268.65°
TVD: 7,178.14'
VS: 3,746.15'

MW IN: 10.1+
VIS IN: 48
MW OUT: 10.1+
VIS OUT: 44

MD: 11,165'
INC: 89.69°
AZM: 268.3°
TVD: 7,178.65'
VS: 3,833.71'

WOB: 33.9klbs
RPM: 69
SPM: 194
SPP: 5,529psi

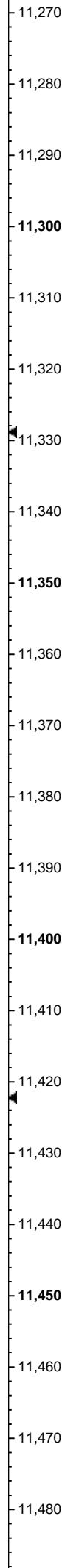
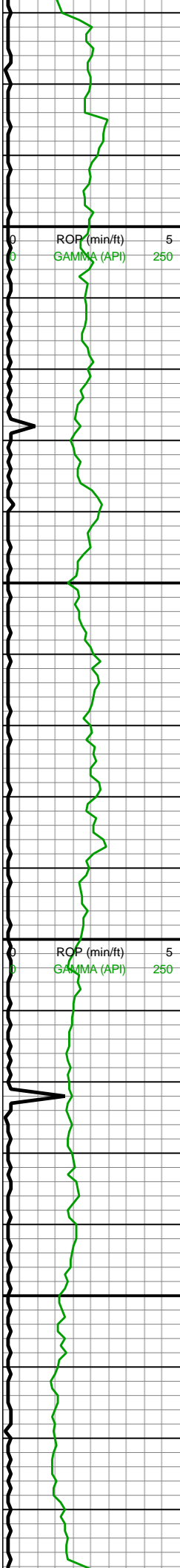
MD: 11,260'
INC: 89.47°
AZM: 268.74°
TVD: 7,179.35'
VS: 3,922.23'



11000-11100 CHK
(70%): mot dk med gy, sb
blky, frm-brit, MRLST incl,
v thn MRLST lamn, sme
chky tex, v calc; MRLST
(30%): v dk gy, frm, sb
blky, v thn CHK lamn,
intbd CHK, hi calc

11100-11200 CHK
(80%): mot gyshbn, mot
med gy, sb blky, frm-brit,
MRLST incl, v thn MRLST
lamn, sme chky tex, v
calc; MRLST (20%): dk
gy-v dk gy, frm, sb blky, v
thn CHK lamn, intbd
CHK, hi calc



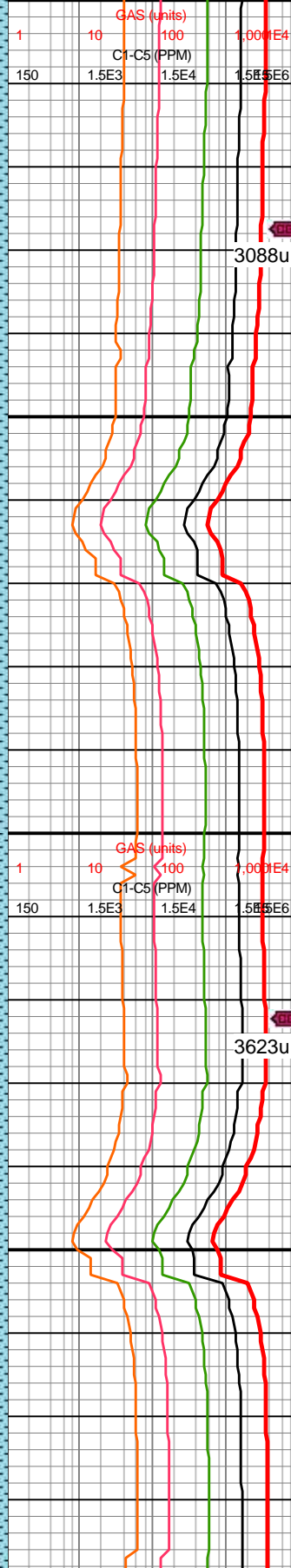
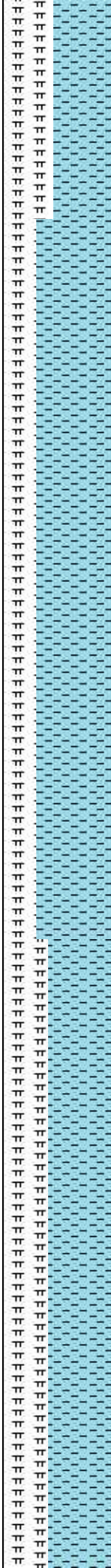


MW IN: 10.1+
VIS IN: 49
MW OUT: 10.2
VIS OUT: 45

MD: 11,354'
INC: 88.86°
AZM: 268.92°
TVD: 7,180.72'
VS: 4,010'

WOB: 35.7klbs
RPM: 70
SPM: 192
SPP: 5,462psi

MD: 11,449'
INC: 88.73°
AZM: 269.01°
TVD: 7,182.71'
VS: 4,098.76'

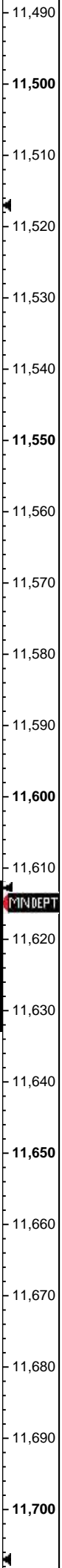
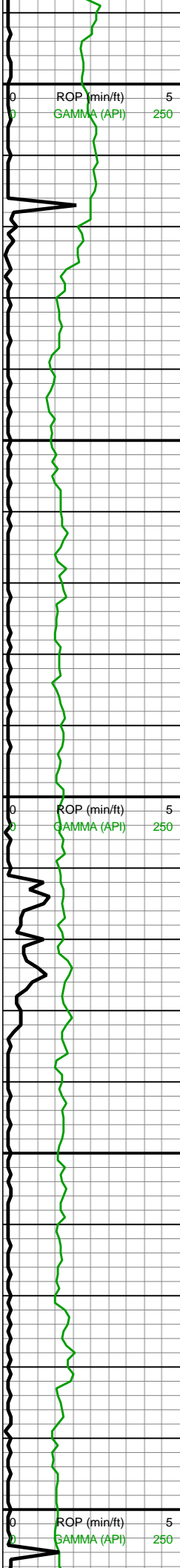


11200-11300 CHK
(60%): mot med gy-mot
dk med gy, sb blky,
frm-brit, MRLST incl, v thn
MRLST lamn, sme chky
tex, v calc; MRLST (40%):
v dk gy, frm-sl hrd, sb
blky, v thn CHK lamn,
intbd CHK, hi calc

11300-11400 CHK
(70%): mot med gy-mot
dk med gy, tr lt gy, sb
blky, frm-brit, MRLST incl,
v thn MRLST lamn, sme
chky tex, v calc; MRLST
(30%): v dk gy, frm-sl hrd,
sb blky, v thn CHK lamn,
intbd CHK, hi calc, rr free
pyr

11400-11500 CHK
(60%): mot dk med gy,
sme lt gy, sb blky,
frm-brit, MRLST incl, v thn
MRLST lamn, sme chky
tex, v calc; MRLST (40%):





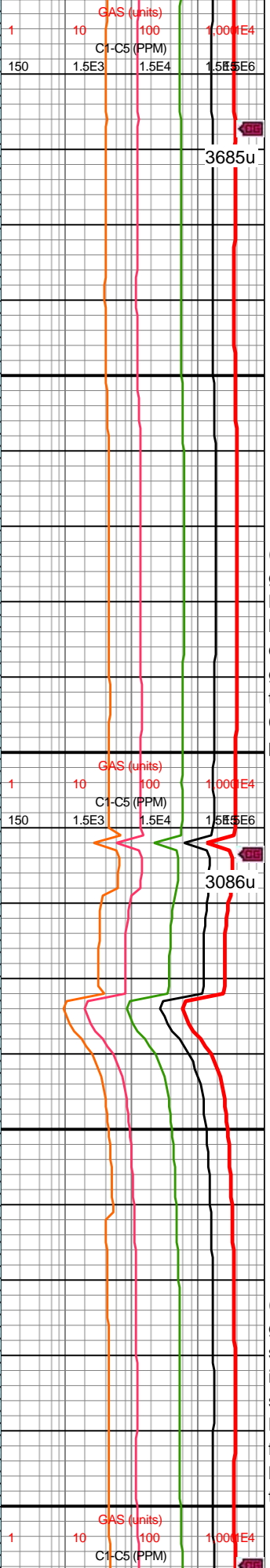
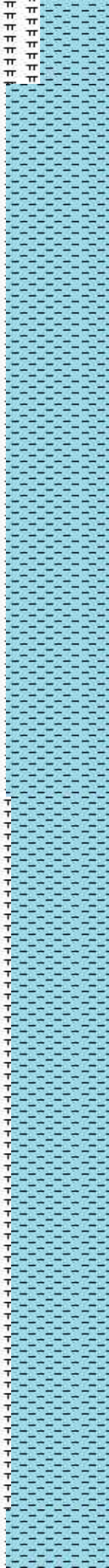
MD: 11,544'
INC: 88.24°
AZM: 269.18°
TVD: 7,185.23'
VS: 4,187.6'

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

WOB: 31.6klbs
RPM: 70
SPM: 193
SPP: 5,561psi

MIN DEPT 12/19/2018

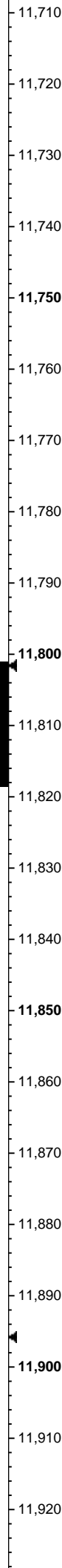
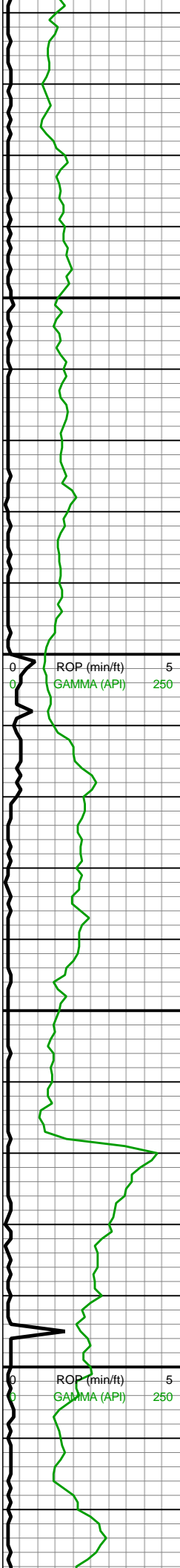
MD: 11,638'
INC: 87.67°
AZM: 267.51°
TVD: 7,188.58'
VS: 4,275.02'



v dk gy-dk gy, frm-sl hrd, sb blk, v thn CHK lamn, intbd CHK, hi calc, tr free pyr

11500-11600 CHK (90%): mot med gy-mot lt gy, sb blk, frm-brit, MRLST incl, v thn MRLST lamn, sme chky tex, v calc; MRLST (10%): v dk gy, frm-sl hrd, sb blk, v thn CHK lamn, intbd CHK, hi calc, sme free pyr

11600-11700 CHK (85%): predy mot med gy-mot lt gy, sme gyshbn, sb blk, frm-brit, MRLST incl, v thn MRLST lamn, sme chky tex, v calc; MRLST (15%): v dk gy, frm, sb blk, v thn CHK lamn, intbd CHK, hi calc, tr free pyr



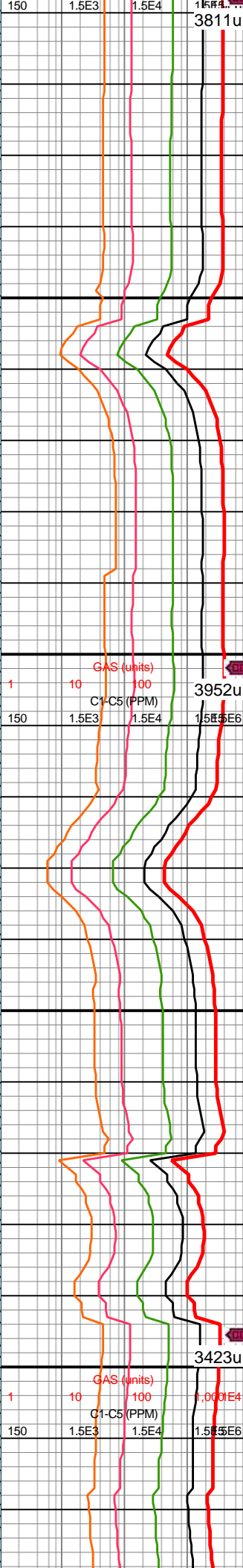
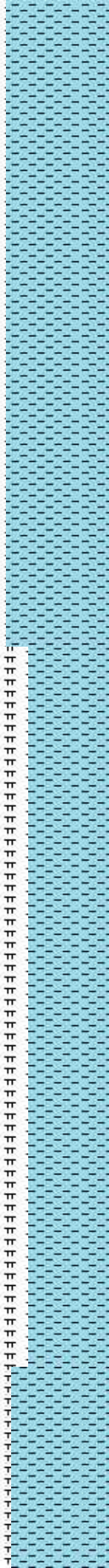
MD: 11,732'
INC: 87.01°
AZM: 267.34°
TVD: 7,192.94'
VS: 4,361.85'

WOB: 35.7klbs
RPM: 70
SPM: 191
SPP: 5,570psi

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

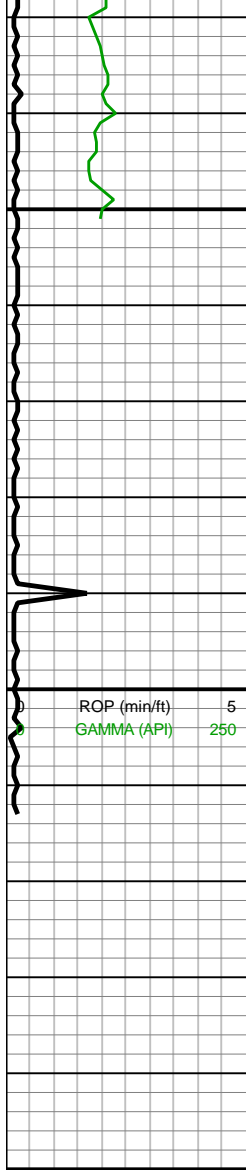
MD: 11,827'
INC: 87.98°
AZM: 268.13°
TVD: 7,197.09'
VS: 4,449.81'

MD: 11,922'
INC: 86.88°
AZM: 268.57°
TVD: 7,201.35'
VS: 4,538.14'



11700-11800 CHK
(90%): predy mot med
gy-gyshbn, sme lt gy, sb
blky, frm-brit, MRLST incl,
v thn MRLST lamn, sme
chky tex, v calc; MRLST
(10%): dk gy, frm, sb blky,
v thn CHK lamn, intbd
CHK, hi calc, rr free pyr

11800-11900 CHK
(70%): predy mot lt
gy-gyshbn, sme med gy,
sb blky, frm-brit, MRLST
incl, v thn MRLST lamn,
sme chky tex, v calc;
MRLST (30%): med gy-dk
gy, frm, sb blky, v thn
CHK lamn, intbd CHK, hi
calc



11,930
11,940
11,950
11,960
11,970
11,980
11,990
12,000
12,010
12,020
12,030
12,040
12,050

MD: 11,946'
INC: 86.48°
AZM: 268.48°
TVD: 7,202.74'
VS: 4,560.47'

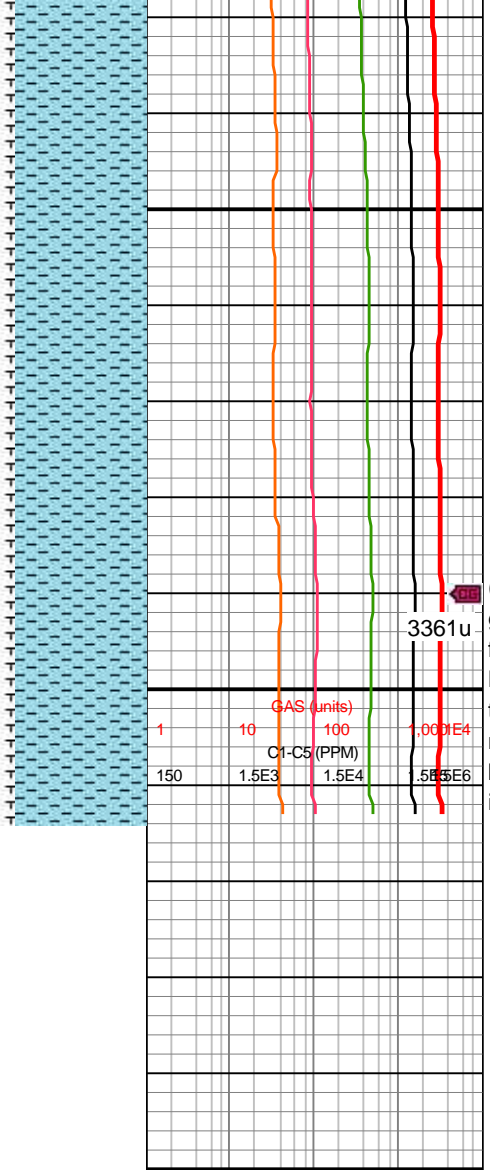
MW IN: 10.2
VIS IN: 48
MW OUT: 10.2+
VIS OUT: 44

WOB: 33.6klbs
RPM: 70
SPM: 192
SPP: 5,512psi

Projection to Bit

MD: 12,014'
INC: 86.48°
AZM: 268.48°
TVD: 7,206.92'
VS: 4,623.69'

**Total Depth of
12,014' MD
Reached on
12/19/2018 @
02:05 MST**



11900-12014 CHK
(85%): predy mot lt
gy-med gy, sb blk,
frm-brit, MRLST incl, v thn
MRLST lamn, sme chky
tex, v calc; MRLST (15%):
med gy-dk gy, frm, sb
blk, v thn CHK lamn,
intbd CHK, hi calc

