



Empirica

Scale: 5" / 100'
Measured Depth Log

Well Name Winder South 4

Location Sec. 9-T6N-R67W

State Colorado

Country USA

County Weld

Rig Number Patterson 346

API Number 05-123-43400-00

Field Wattenberg

Geographic Region DJ Basin

Drilling Completed 9/7/2016

Spud Date 9/4/2016

Surface Coordinates SHL: 2306'FNL, 468' FEL, Sec. 9 T6N R67W

Lat: 40° 30' 9.6258"

Long: -104° 53' 25.998"

Bottom Hole Coordinates BHL: 2035'FFSLL, 460' FFWLL, Sec. 8 T6N R67W

Ground Elevation 4,855'

K.B. Elevation 4,879.5'

Logged Interval 6,560 To 16,870'

Total Depth 16,870'

Formation Niobrara A Chalk

Type of Drilling Fluid Oil Based Mud

Operator

Company Extraction Oil & Gas

Address 1888 Sherman St., Suite 200
Denver, CO 80203

Geologist

Name Jared Rouse

Company Extraction Oil & Gas

Address 1888 Sherman St., Suite 200
Denver, CO 80203



Other

Equipment ML-589

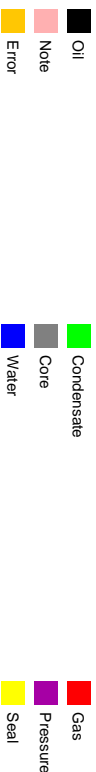
Comments Start: 9-4-16
TD: 9-7-16

Services Provided 2-man Logging
On Site Geosteering

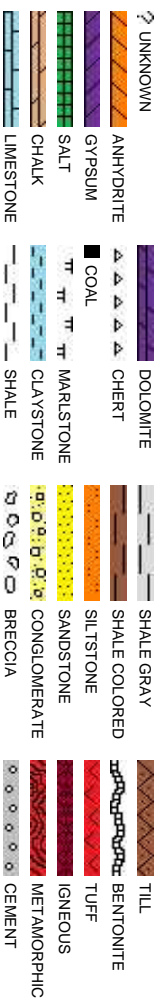
Logger Names Dominic Pitre/ Nicholas W

Address ALS Empirica
6510 Guhn Road
Houston, Texas 77040

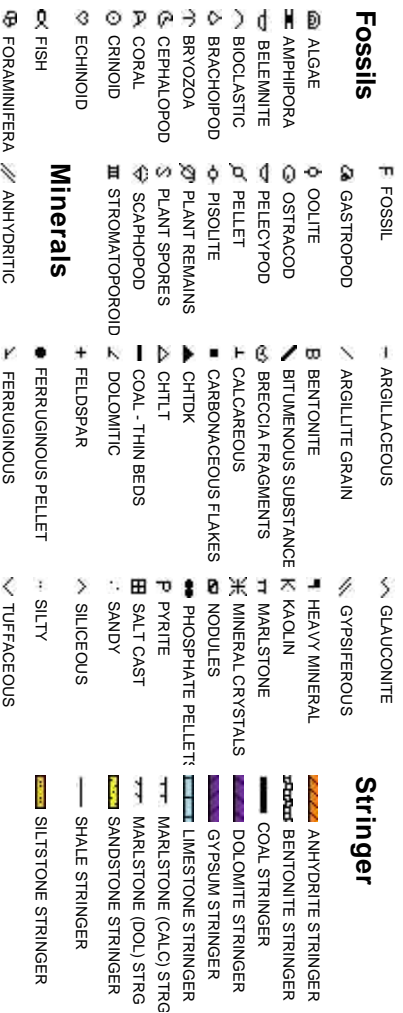
Zone Color Coding



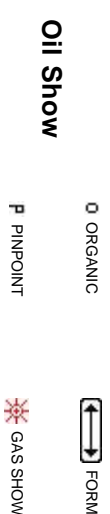
Rock Types



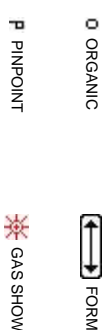
Accessories



Other Sym



Oil Show



Engineering



Porosity



Symbols

L LITHOGRAPHIC

Rounding

MX MICROXLN

A ANGULAR MS MUDSTONE

R ROUNDED PS PACKSTONE

S SUBANG WS WACKESTONE

F SUBRND

Sorting

T

Textures

M MODERATE

B BOUNDSTONE P POOR

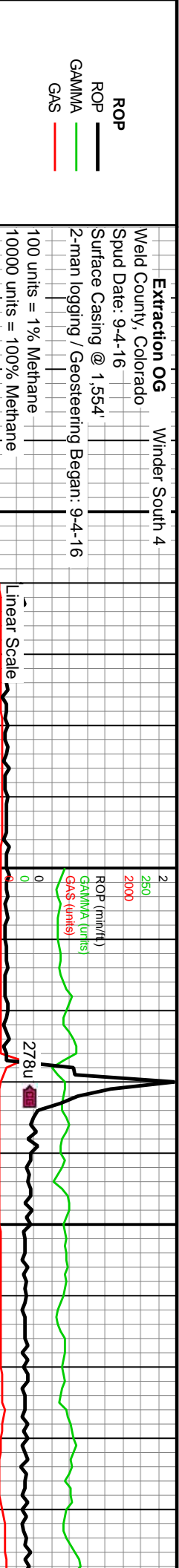
C CHALKY W WELL

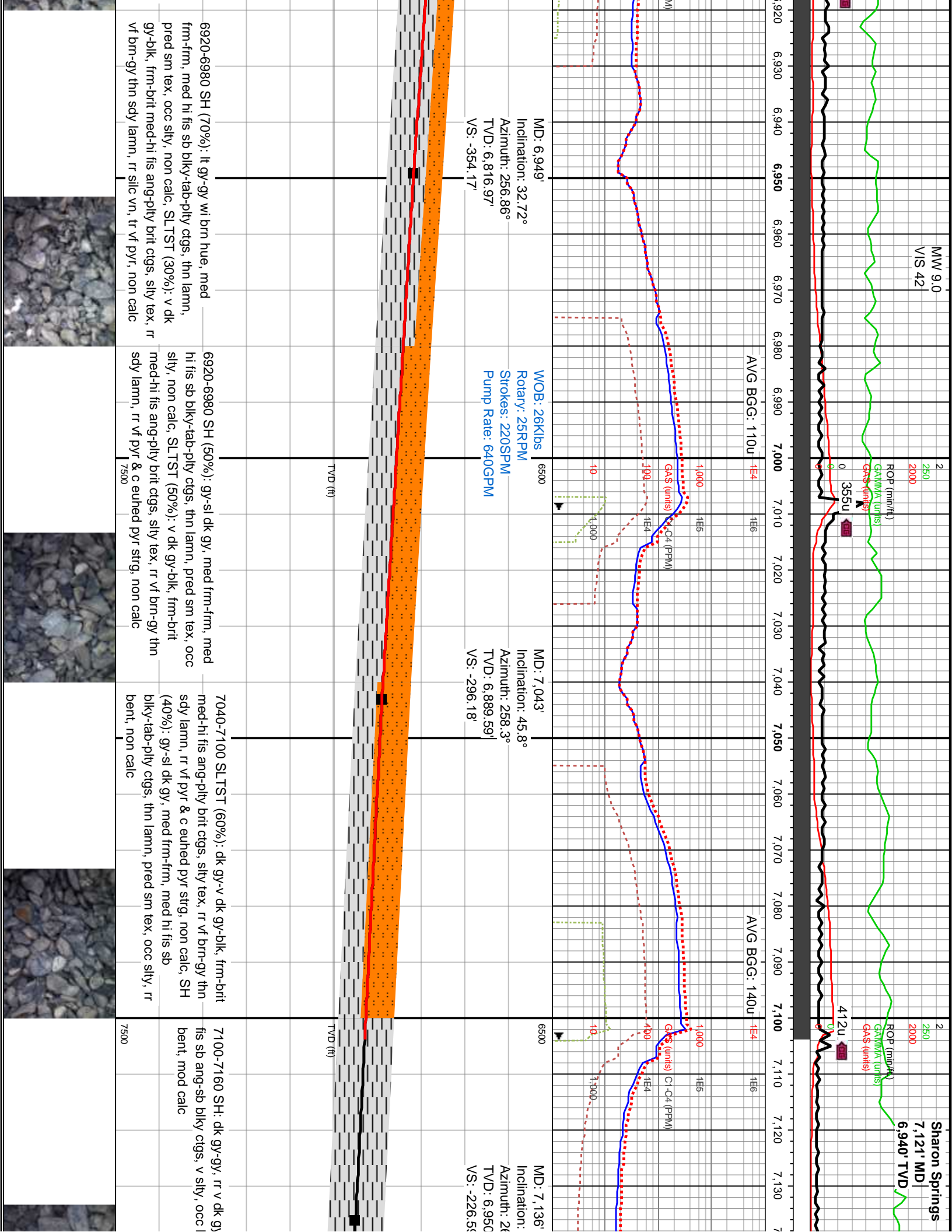
CX CRYPTOXLN

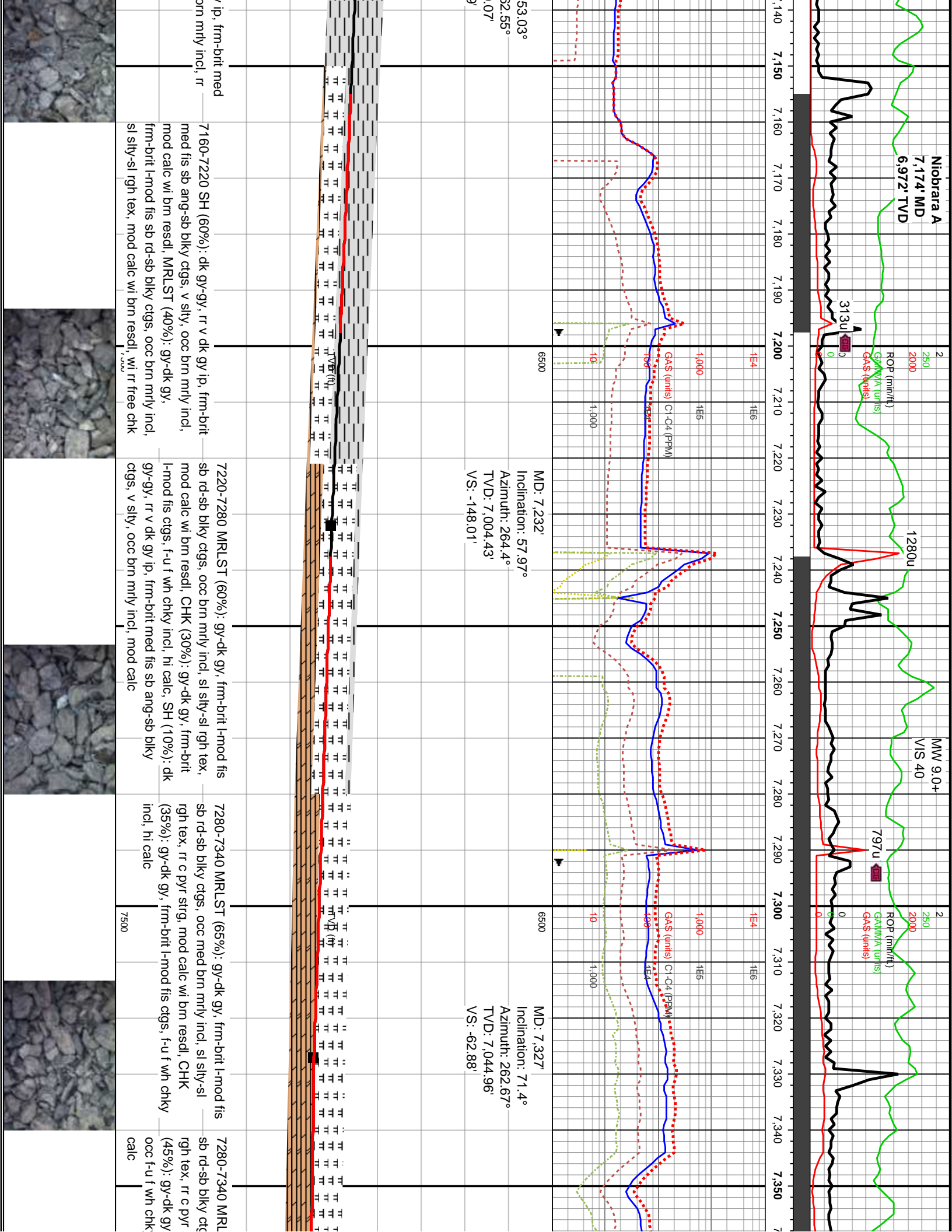
E EARTHY

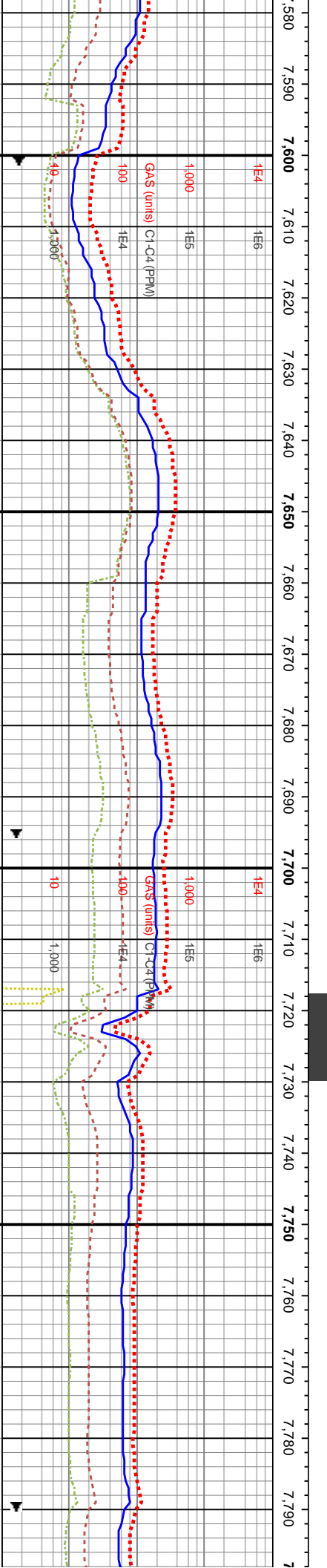
F FINELYXLN

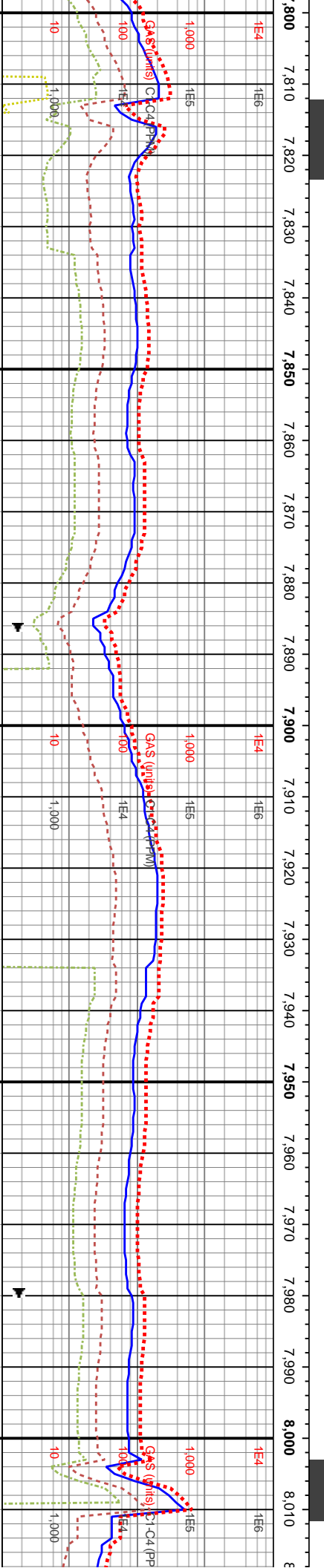
G GRANSTONE





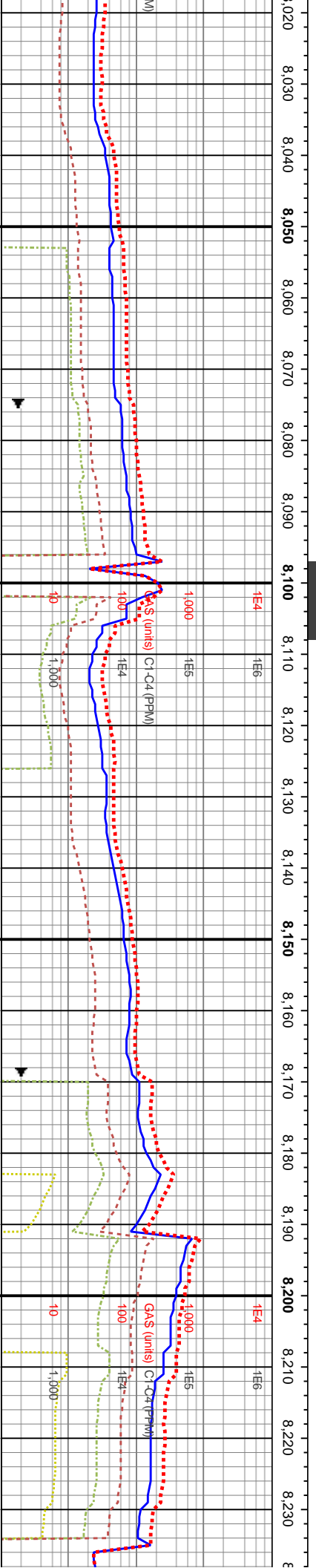
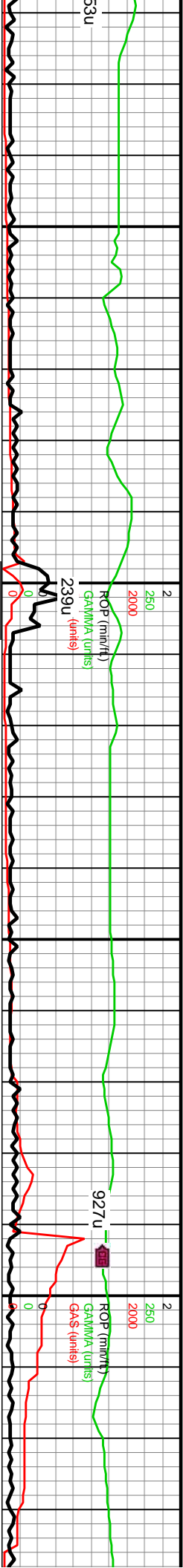






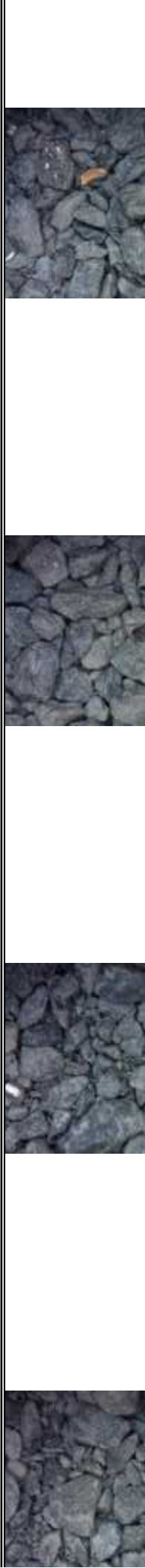
α MD: 8,014'
Inclination: 9;
Azimuth: 269
TVD: 7,055.9

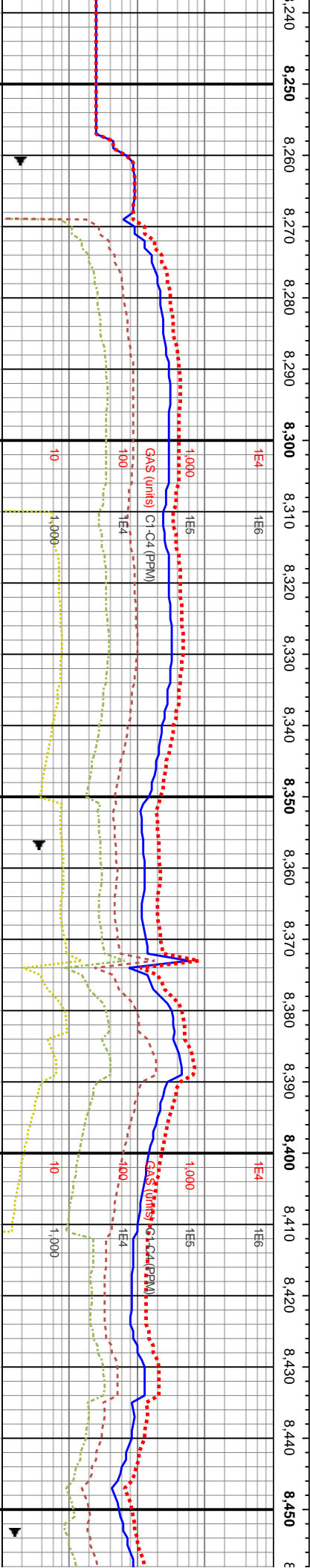
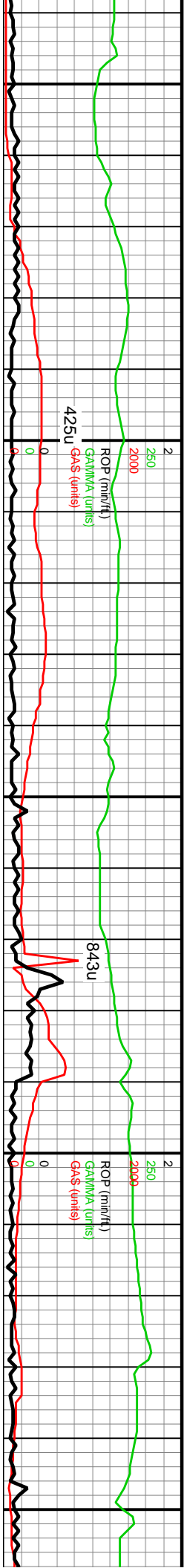
offwht - l	
pred sb	
occ cald	
blk, sma	
blky, arri	
7500	



MD: 8,109'
Inclination: 91.24°
Azimuth: 268.96°
TVD: 7,052.97'

Depth (ft)	8060-8120 CHK (60%): pred med- dk gy, offwh- bf- brn mot, frm- sl hd, sme sl frm, pred sb blk, pred mod arg, mrlly intbds thru, occ calc incl, rr pyr; MRLST (40%): dk gy- sl blk, sme bf- gy mot, pred hd, sb pily- fis, ip sb blk, arg thru, tr cal incl- lse cal	8120-8180 CHK (60%): pred med- dk gy, offwh- bf- brn mot, frm- sl hd, sme sl frm, pred sb blk, pred mod arg, mrlly intbds thru, occ calc incl, rr pyr; MRLST (40%): dk gy- sl blk, sme bf- gy mot, pred hd, sb pily- fis, ip sb blk, arg thru, tr cal incl- lse cal	8180-8240 CHK (60%): pred med- dk gy, offwh- bf- brn mot, frm- sl hd, sme sl frm, pred sb blk, pred mod arg, mrlly intbds thru, occ calc incl, rr pyr; MRLST (40%): dk gy- sl blk, sme bf- gy mot, pred hd, sb pily- fis, ip sb blk, arg thru, tr cal incl- lse cal
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			
8,190			
8,200			
8,210			
8,220			
8,230			





MD: 8,298'
Inclination: 92.82°
Azimuth: 268.9°
TVD: 7,046.46'

MD: 8,393'
Inclination: 91.48°
Azimuth: 269.99°
TVD: 7,042.9'
VS: 1,000.14'

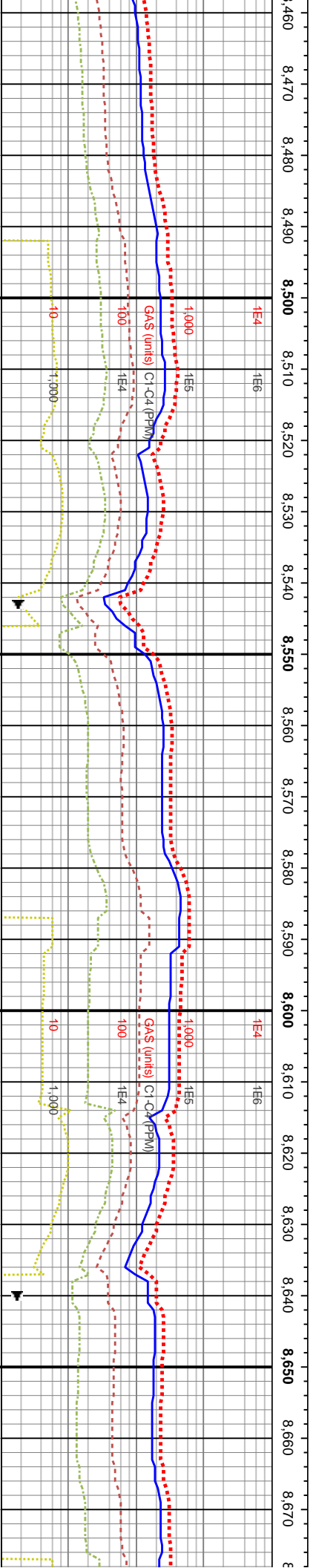
8240-8300 MRLST (60%): dk gy- sl blk, sme bf- gy mot, pred hd, sb pty- fis, ip sb blk, arg thru, tr cal incl- lse cal; CHK (4%): pred med- dk gy, offwht- bf- brn mot, frm- sl hd, sme sl frm, pred sb blk, pred mod arg, mrlly intbds thru, occ calc incl, rr pyr

8300-8360 MRLST (60%): dk gy- sl blk, sme bf- gy mot, pred hd, sb pty- fis, ip sb blk, arg thru, tr cal incl- lse cal; CHK (4%): pred med- dk gy, offwht- bf- brn mot, frm- sl hd, sme sl frm, pred sb blk, pred mod arg, mrlly intbds thru, occ calc incl, rr pyr

8360-8420 MRLST (50%): dk gy- sl blk, sme bf- gy mot, pred hd, sb pty- fis, ip sb blk, arg thru, tr cal incl- lse cal, rr pyr; CHK (50%): pred med- dk gy, offwht- bf- brn mot, frm- sl hd, sme sl frm, pred sb blk, pred mod arg, mrlly intbds thru, occ calc incl, rr pyr

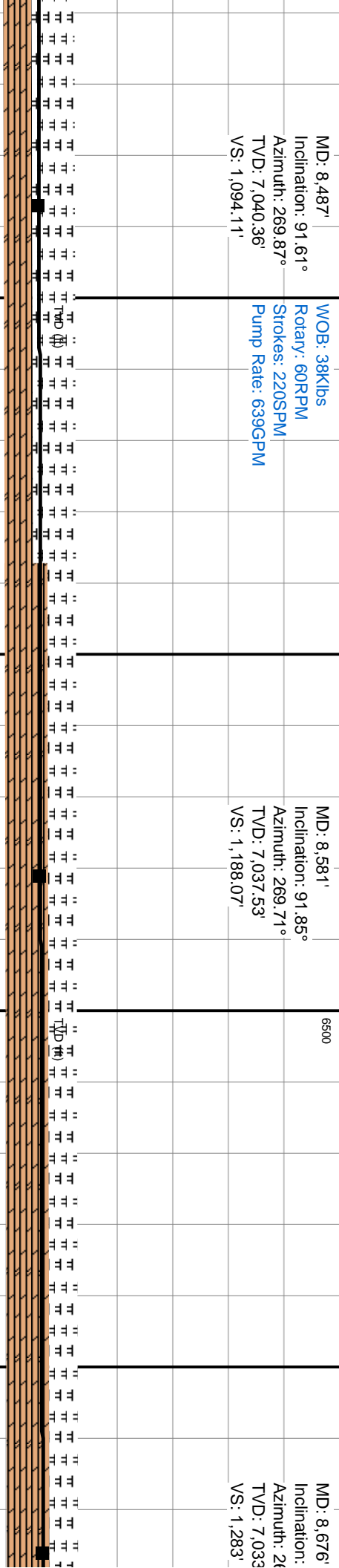
8420-8480 CHK (55%): pre offwht- bf- brn mot, frm- sl t sb blk, pred mod arg, mrlly calc incl, rr pyr, rr bent; MRLST (45%): blk, sme bf- gy mot, pred hc blk, arg thru, tr cal incl- lse





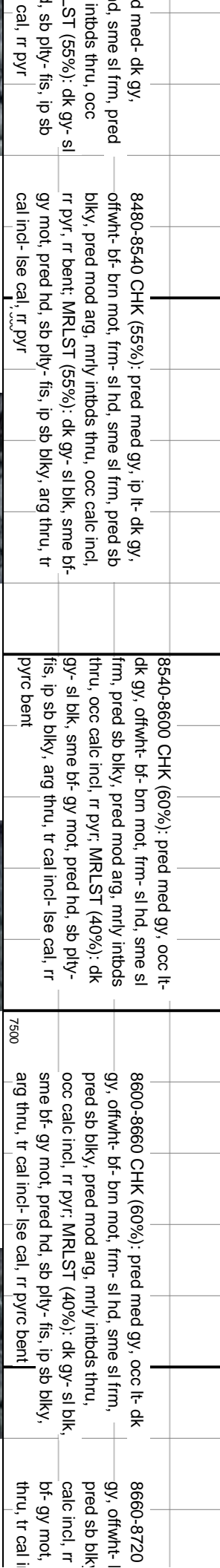
MD: 8,487'
Inclination: 91.61°
Azimuth: 269.87°
TVD: 7,040.36'
VS: 1,094.11'

WOB: 38Klbs
Rotary: 60RPM
Strokes: 220SPM
Pump Rate: 639GPM

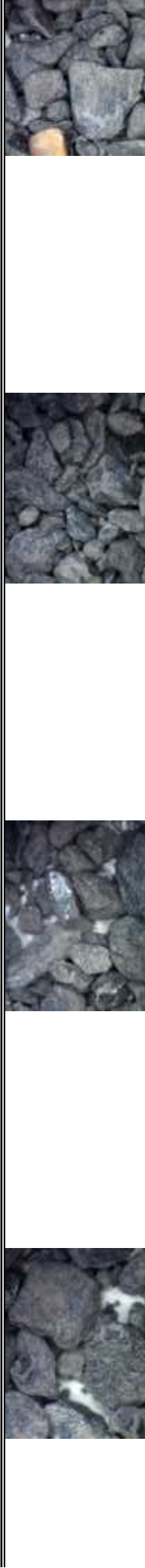


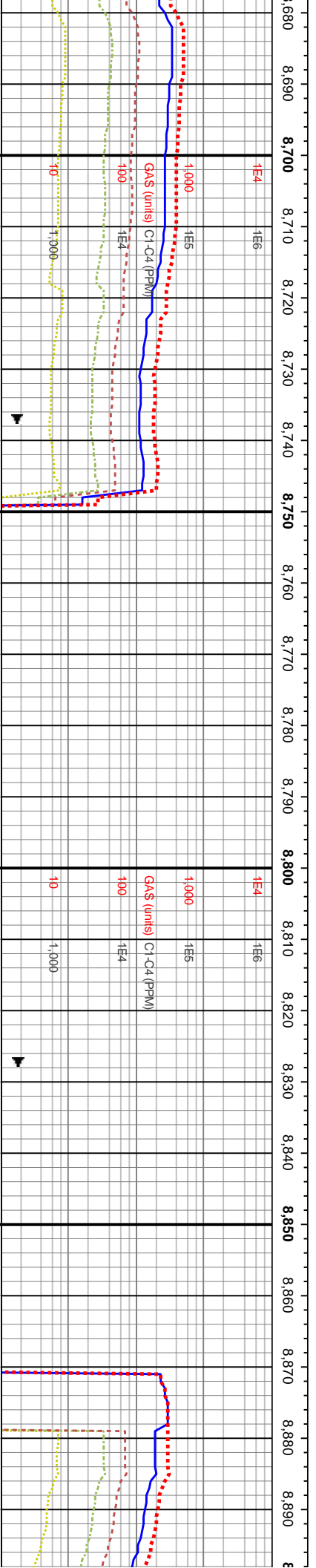
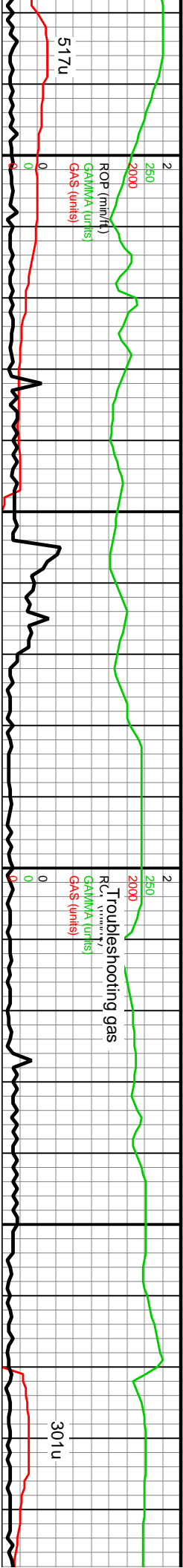
MD: 8,581'
Inclination: 91.85°
Azimuth: 269.71°
TVD: 7,037.53'
VS: 1,188.07'

6500



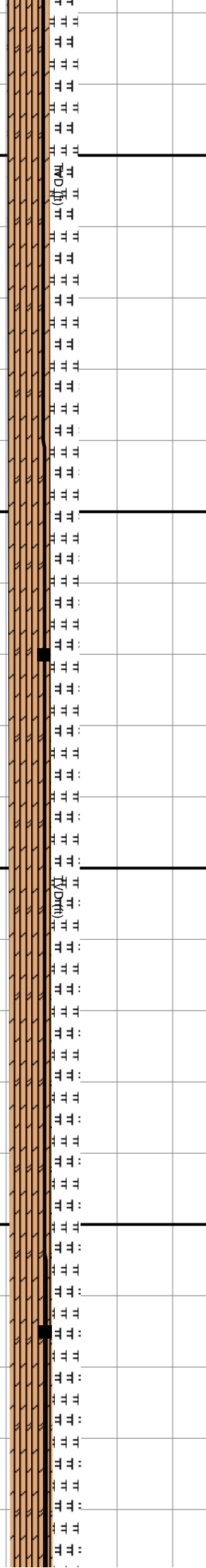
7500





92.42°
99.54°
99°

MD: 8,770'
Inclination: 91.01°
Azimuth: 270.7°
TVD: 7,031.17'
VS: 1,376.95'

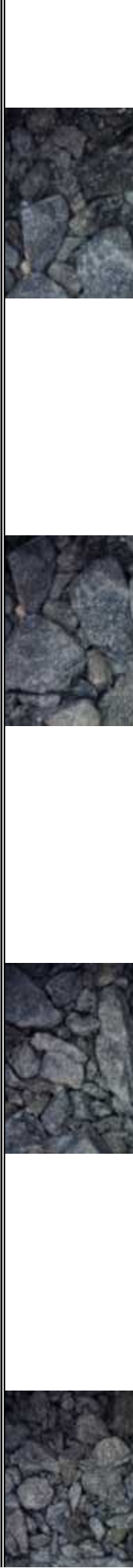


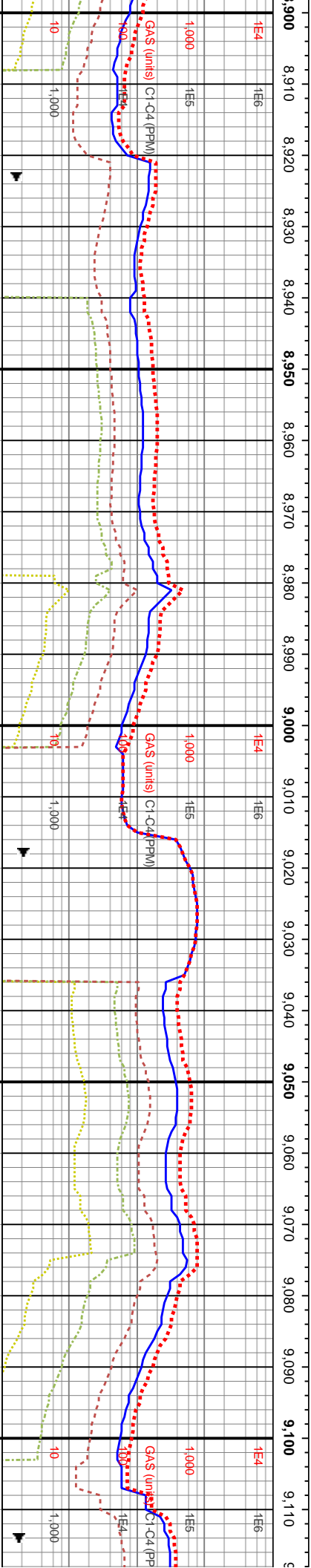
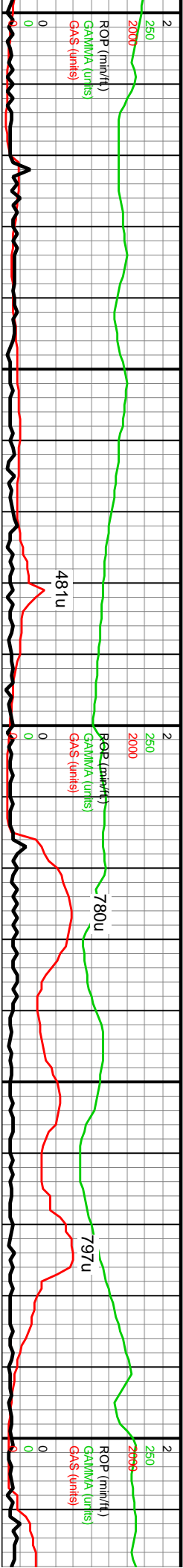
CHK (60%): pred med gy, occ lt- dk
gy, offwh- bf- brn mot, frm- sl hd, sme sl frm,
pyr: MRLST (40%): dk gy- sl blk, sme
pred hd, sb ply- fis, ip sb blk, arg
incl- lse cal, rr pyrc bent

8720-8780 CHK (70%): pred med gy, occ lt- dk
gy, offwh- bf- brn mot, frm- sl hd, sme sl frm,
pred sb blk, pred mod arg, mrlly intbds thru,
occ calc incl, rr pyr: MRLST (30%): dk gy- sl blk,
sme bf- gy mot, pred hd, sb ply- fis, ip sb blk,
arg thru, tr cal incl- lse cal, rr pyrc bent

8780-8840 CHK (70%): pred med gy, occ
lt- dk gy, offwh- bf- brn mot, frm- sl hd,
sme sl frm, pred sb blk, pred mod arg,
mrlly intbds thru, occ calc incl, rr pyr:
MRLST (30%): dk gy- sl blk, sme bf- gy
mot, pred hd, sb ply- fis, ip sb blk, arg
thru, tr cal incl- lse cal, rr pyrc bent

8840-8900 CHK (70%): pred med gy, occ lt- dk
gy, offwh- bf- brn mot, frm- sl hd, sme sl frm, pred
sb blk, pred mod arg, mrlly intbds thru, occ calc
incl, rr pyr: MRLST (30%): dk gy- sl blk, sme bf- gy
mot, pred hd, sb ply- fis, ip sb blk, arg thru, tr cal
incl- lse cal, rr pyrc bent

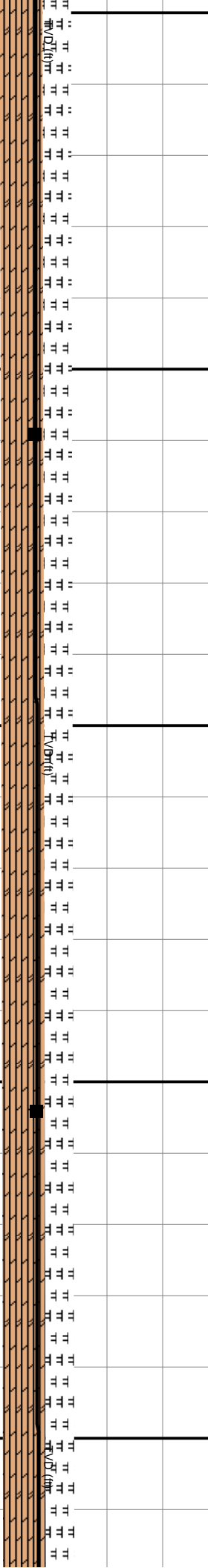




MD: 8,959'
Inclination: 90.74°
Azimuth: 269.92°
TVD: 7,027.62'
VS: 1,565.9'

MOB: 41Klbs
Rotary: 60RPM
Strokes: 220SPM
Pump Rate: 639GPM

MD: 9,054'
Inclination: 91.41°
Azimuth: 269.32°
TVD: 7,025.84'
VS: 1,660.88'



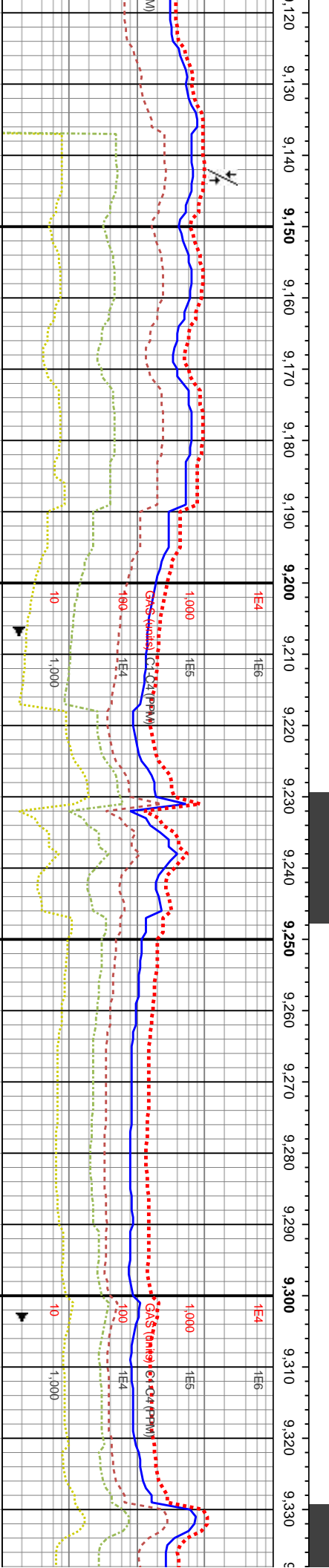
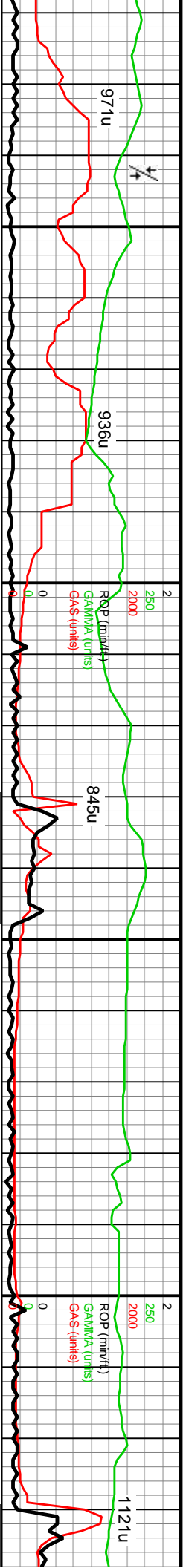
8900-8960 CHK (70%): pred med gy, occ lt-dk gy, offwht-bf-brn mot, frm-sl hd, sme sl frm, pred sb blk, pred mod arg, mrlly intbds thru, occ calc incl, MRLST (30%): dk gy-sl blk, sme bf-gy mot, pred hd, sb ply-fls, ip sb blk, arg thru, tr cal incl-lse cal, rr pyrc bent

8960-9020 CHK (70%): pred med gy, occ lt-dk gy, offwht-bf-brn mot, frm-sl hd, sme sl frm, pred sb blk, pred mod arg, mrlly intbds thru, occ calc incl, MRLST (30%): dk gy-sl blk, sme bf-gy mot, pred hd, sb ply-fls, ip sb blk, arg thru, tr cal incl-lse cal, rr pyrc bent

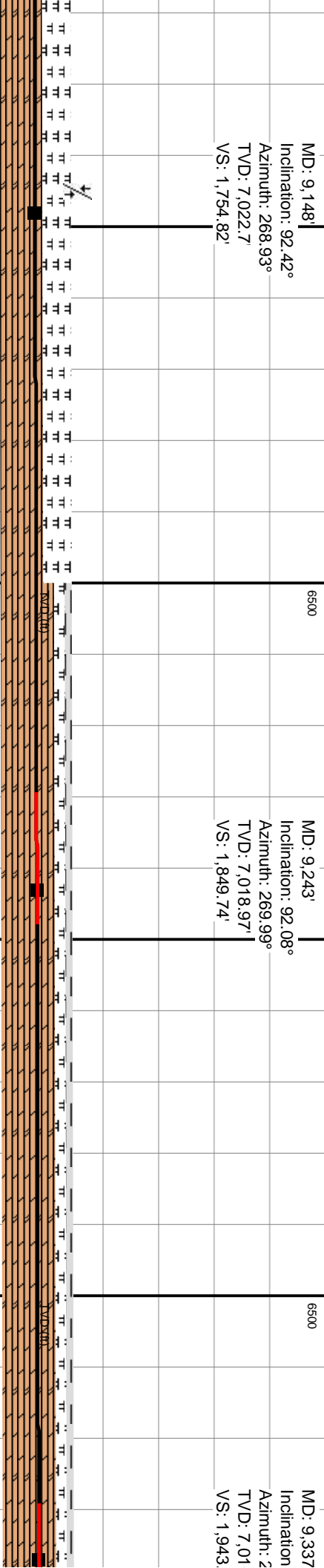
9020-9080 CHK (75%): pred med gy, occ lt-dk gy, offwht-bf-brn mot, frm-sl hd, sme sl frm, pred sb blk, pred mod arg, mrlly intbds thru, occ calc incl, MRLST (25%): dk gy-sl blk, sme bf-gy mot, pred hd, sb ply-fls, ip sb blk, arg thru, tr cal incl-lse cal, rr pyrc bent

9080-9140 CHK (75%): pred med gy, offwht-bf-brn mot, frm, pred sb blk, pred mod arg, mrlly intbds thru, occ calc incl, MRLST (25%): dk gy-sl blk, sme bf-gy mot, pred hd, sb ply-fls, ip sb blk, arg thru, tr cal incl-lse cal, rr pyrc bent

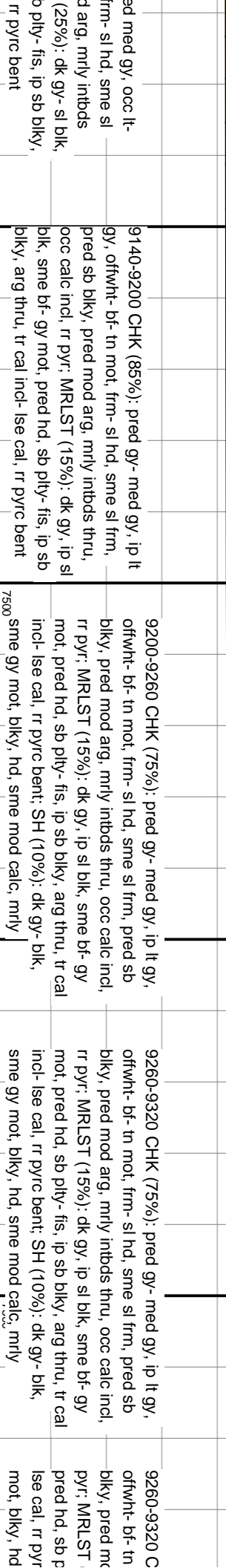




MD: 9,148'
Inclination: 92.42°
Azimuth: 268.93°
TVD: 7,022.7
VS: 1,754.82



MD: 9,243'
Inclination: 92.08°
Azimuth: 269.99°
TVD: 7,018.97'
VS: 1,849.74'



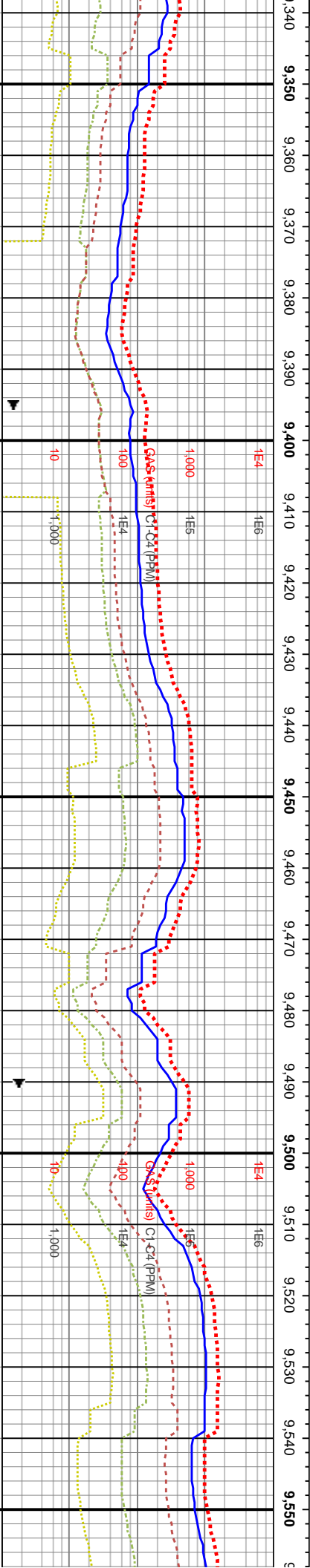
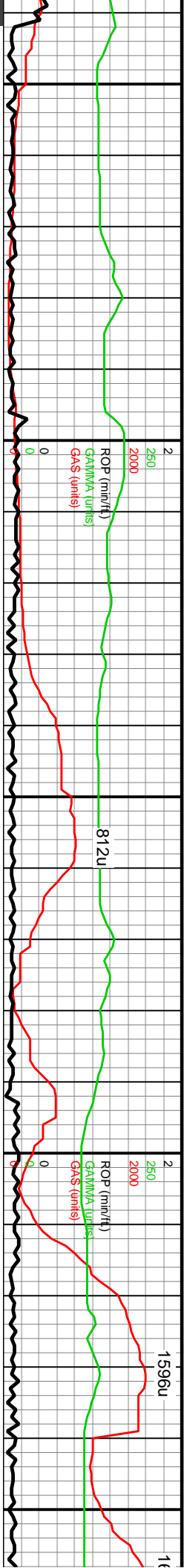
9200-9260 CHK (75%): pred gy- med gy, ip lt gy, offwht- bf- tn mot, frm- sl hd, sme sl frm, pred sb blk, pred mod arg, mrlly intbds thru, occ calc incl, rr pyr: MRLST (15%): dk gy, ip sl blk, sme bf- gy mot, pred hd, sb ply- fis, ip sb blk, arg thru, tr cal incl- lse cal, rr pyrc bent; SH (10%): dk gy- blk, sme gy mot, blk, hd, sme mod calc, mrlly

9260-9320 CHK (75%): pred gy- med gy, ip lt gy, offwht- bf- tn mot, frm- sl hd, sme sl frm, pred sb blk, pred mod arg, mrlly intbds thru, occ calc incl, rr pyr: MRLST (15%): dk gy, ip sl blk, sme bf- gy mot, pred hd, sb ply- fis, ip sb blk, arg thru, tr cal incl- lse cal, rr pyrc bent; SH (10%): dk gy- blk, sme gy mot, blk, hd, sme mod calc, mrlly

9260-9320 C offwht- bf- tn blk, pred mod pyr: MRLST pred hd, sb p lse cal, rr pyrc mot, blk, hd

pred med gy, occ lt- firm- sl hd, sme sl d arg, mrlly intbds (25%): dk gy- sl blk, o ply- fis, ip sb blk, rr pyrc bent





91.41°
71.69°
6.1
68°

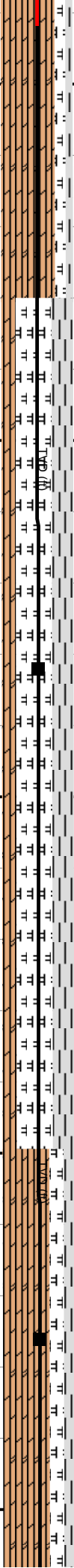
6500

MD: 9.432'
Inclination: 91.68°
Azimuth: 271.9°
TVD: 7,013.54'
VS: 2,038.6'

WOB: 33Klbs
Rotary: 60RPM
Strokes: 220SPM
Pump Rate: 639GPM

6500

MD: 9.526'
Inclination: 91.38°
Azimuth: 271.39°
TVD: 7,011.03'
VS: 2,132.53'



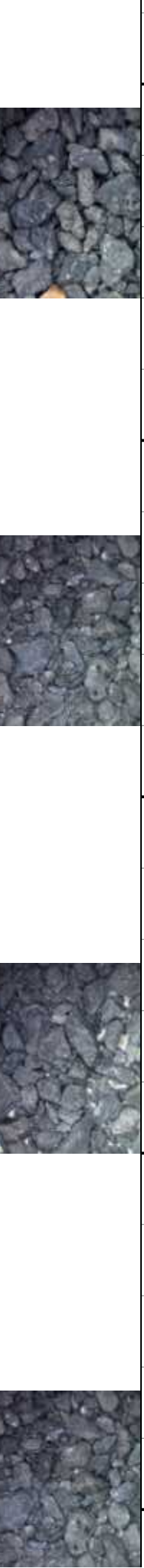
9380-9440 MRLST (50%): dk gy, ip sl blk, sme bf- gy mot, pred hd, sb ply- fis, ip sb blk, arg thru, tr cal incl- lse cal, rr pyr; SH (30%): dk gy- blk, sme gy mot, blk, hd, sme mod calc, mrl; CHK (20%): pred med- dk gy, ip lt gy, offwht- bf- tn mot, frm- sl hd, sme sl frm, pred sb blk, pred mod arg, mrl intbds thru, occ calc incl, rr pyr

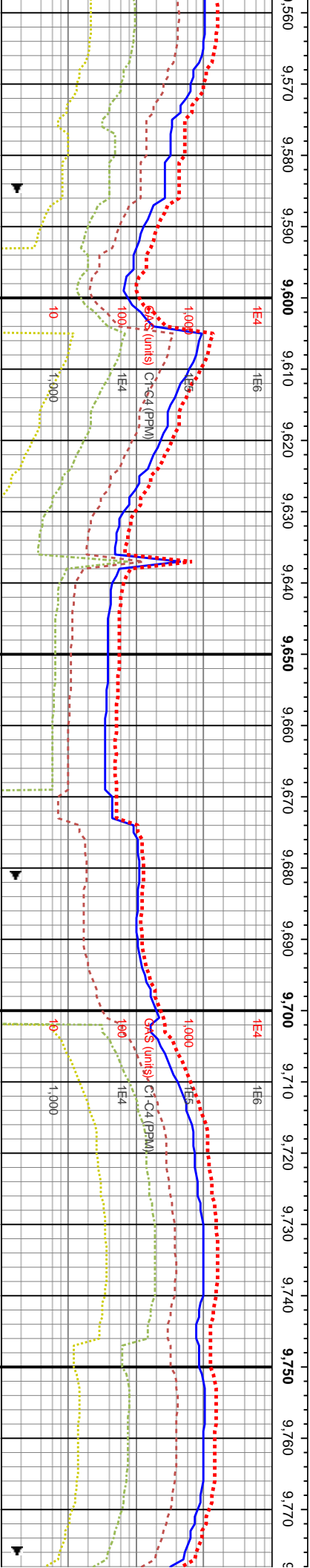
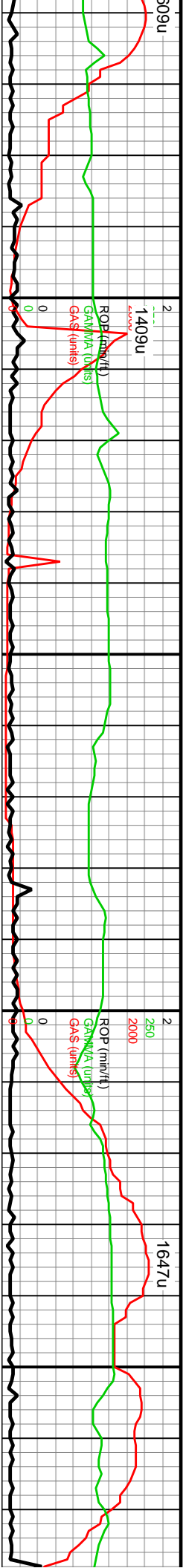
7500

9440-9500 MRLST (50%): dk gy, ip sl blk, sme bf- gy mot, pred hd, sb ply- fis, ip sb blk, arg thru, tr cal incl- lse cal, rr pyr; SH (30%): dk gy- blk, sme gy mot, blk, hd, sme mod calc, mrl; CHK (20%): pred med- dk gy, ip lt gy, offwht- bf- tn mot, frm- sl hd, sme sl frm, pred sb blk, pred mod arg, mrl intbds thru, occ calc incl

7500

9500-9560 CHK (65%): pred med- gy, ip lt gy, offwht- bf- tn mot, frm- sl hd, sme sl frm, pred sb blk, pred sl- mod arg, mrl intbds thru, occ calc incl, rr pyr; MRLST (20%): dk gy, ip sl blk, sme bf- gy mot, pred hd, sb ply- fis, ip sb blk, arg thru, tr cal incl- lse cal, rr pyr; SH (15%): dk gy- blk, sme gy mot, blk, hd- frm, sl calc, mrl



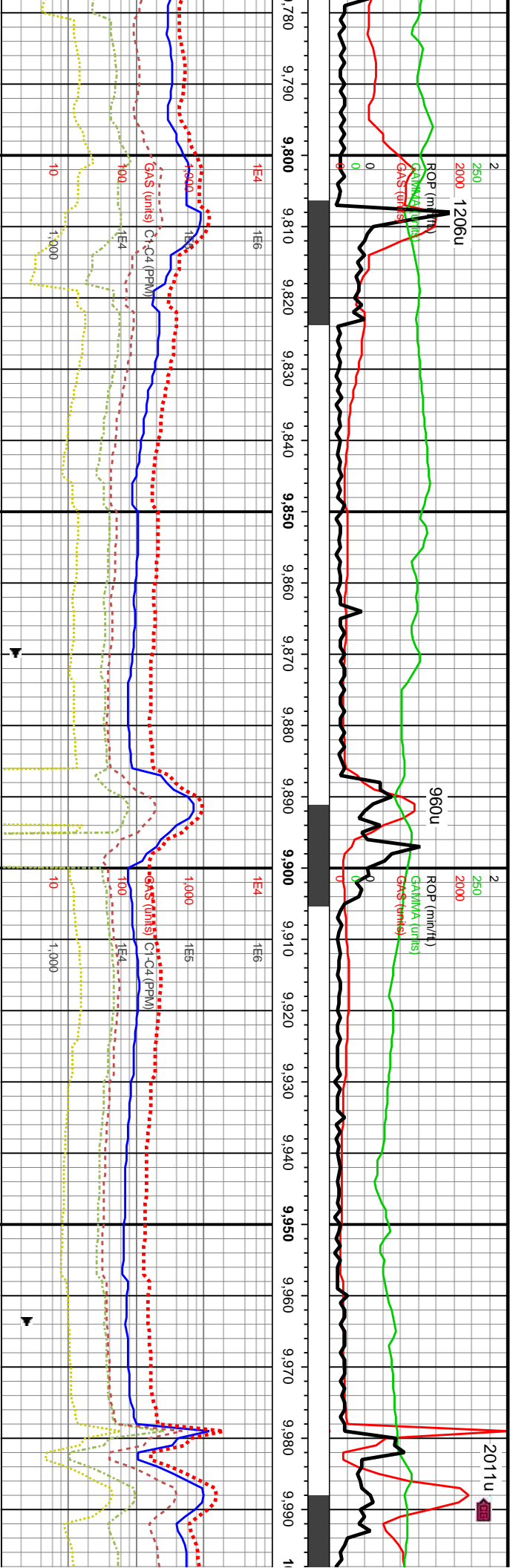


MD: 9,621'
Inclination: 90.97°
Azimuth: 270.04°
TVD: 7,009.08'
VS: 2,227.5'

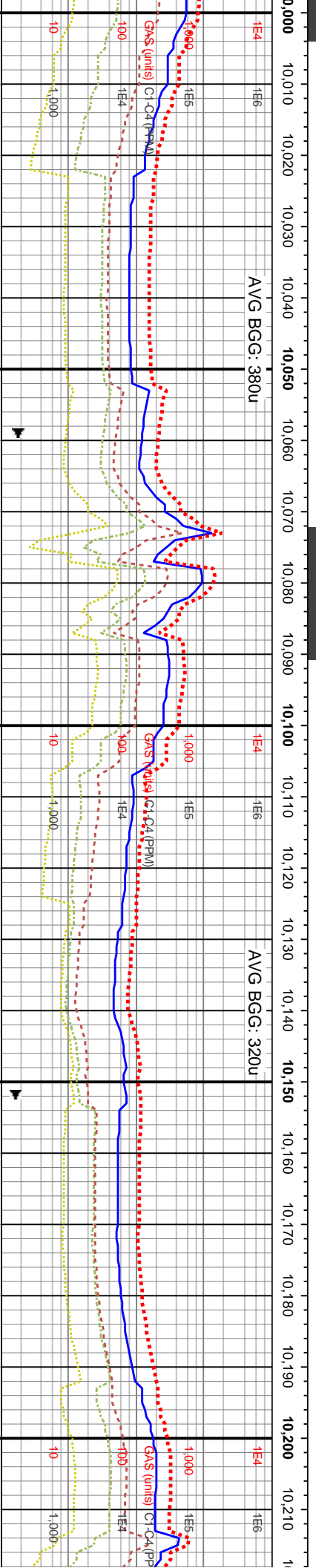
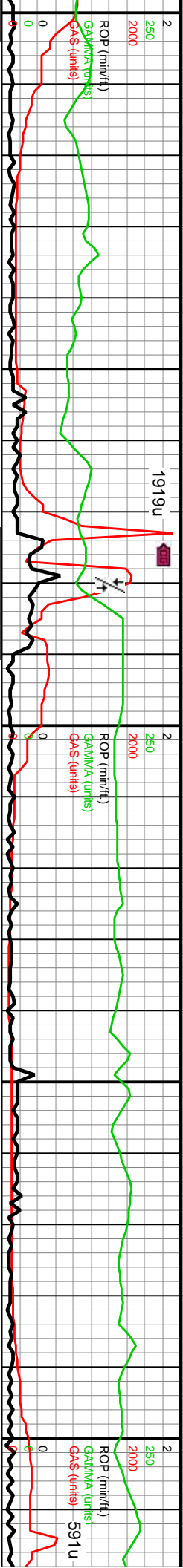
MD: 9,715'
Inclination: 91.04°
Azimuth: 273.81°
TVD: 7,007.43'
VS: 2,321.41'

9560-9620 CHK (65%): pred med- gy, ip lt gy, offwht- bf- tn mot, frm- sl hd, sme sl frm, pred sb blk, pred sl- mod arg, mrlly intbds thru, occ calc incl, rr pyr; MRLST (20%): dk gy, ip sl blk, sme bf- gy mot, pred hd, sb pily- fis, ip sb blk, arg thru, tr cal incl- lse cal, rr pyr; SH (15%): dk gy- blk, sme gy mot, blk, hd- frm, sl calc, mrlly	9620-9680 CHK (75%): pred med- gy, ip lt gy, offwht- bf- tn mot, frm- sl hd, sme sl frm, pred sb blk, pred sl- mod arg, mrlly intbds thru, occ calc incl, rr pyr; MRLST (25%): dk gy, ip sl blk, sme bf- gy mot, pred hd, sb pily- fis, ip sb blk, arg thru, tr cal incl- lse cal, rr pyr, tr sh	9680-9740 CHK (75%): pred med- gy, ip lt gy, offwht- bf- tn mot, frm- sl hd, sme sl frm, pred sb blk, pred sl- mod arg, mrlly intbds thru, occ calc incl, rr pyr; MRLST (25%): dk gy, ip sl blk, sme bf- gy mot, pred hd, sb pily- fis, ip sb blk, arg thru, tr cal incl- lse cal, rr pyr, tr sh	9740-9800 CHK (75%): pred med- gy, ip lt gy, offwht- bf- tn mot, frm- sl hd, sme sl frm, pred sb blk, pred sl- mod arg, mrlly intbds thru, occ calc incl, rr pyr; MRLST (25%): dk gy, ip sl blk, sme bf- gy mot, pred hd, sb pily- fis, ip sb blk, arg thru, tr cal incl- lse cal, rr pyr, tr sh
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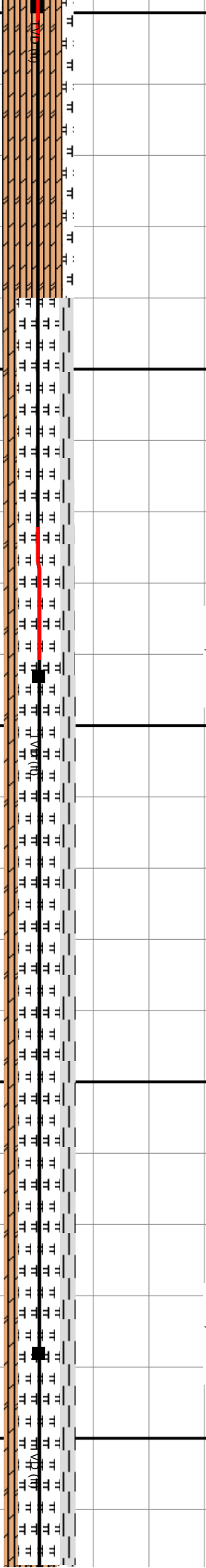


Condition	9800-9860 CHK (85%)	9860-9920 CHK (85%)	9920-9980 CHK (85%)	9980-10000 CHK (85%)
med-gy, ip lt gy, same sl frm, pred only intbds thru, occ dk gy, ip sl blk, ply- fis, ip sb blk, tr pyr, tr sh	9800-9860 CHK (85%): pred gy, ip lt gy, offwht- bf- tn mot thru, frm- sl hd, same sl frm, pred sb blk, pred sl- mod arg, occ mrlst intbds thru, occ calc incl, tr pyr; MRLST (15%): dk gy, ip sl blk, same bf- gy mot, pred hd, sb ply- fis, ip sb blk, arg thru, tr cal incl	9860-9920 CHK (85%): pred gy, ip lt gy, offwht- bf- tn mot thru, frm- sl hd, same sl frm, pred sb blk, pred sl- mod arg, occ mrlst intbds thru, occ calc incl, tr pyr; MRLST (15%): dk gy, ip sl blk, same bf- gy mot, pred hd, sb ply- fis, ip sb blk, arg thru, tr cal incl	9920-9980 CHK (85%): pred gy, ip lt gy, offwht- bf- tn mot thru, frm- sl hd, same sl frm, pred sb blk, pred sl- mod arg, occ mrlst intbds thru, occ calc incl, tr pyr; MRLST (15%): dk gy, ip sl blk, same bf- gy mot, pred hd, sb ply- fis, ip sb blk, arg thru, tr cal incl	9980-10000 CHK (85%): pred gy, ip lt gy, offwht- bf- tn mot thru, frm- sl hd, same sl frm, pred sb blk, pred sl- mod arg, occ mrlst intbds thru, occ calc incl, tr pyr; MRLST (15%): dk gy, ip sl blk, same bf- gy mot, pred hd, sb ply- fis, ip sb blk, arg thru, tr cal incl



WOB: 61Klbs
Rotary: 0RPM
Strokes: 220SPM
Pump Rate: 639GPM

MD: 10,093'
Inclination: 90.77°
Azimuth: 270.06°
TVD: 6,998.4
VS: 2,698.67

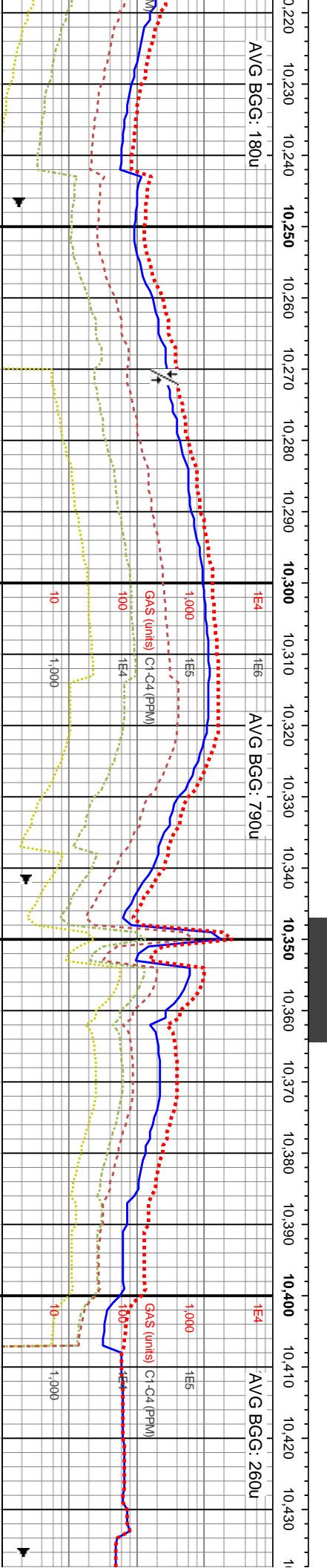
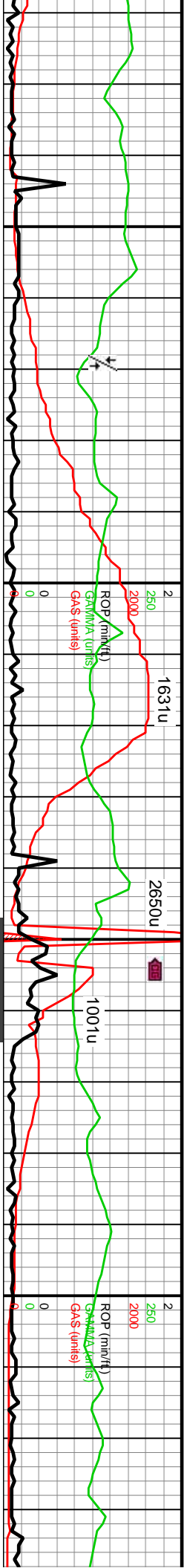


10040-10100 MRLST (60%): dk gy, ip sl blk, sme
bf- gy mot, pred hd, sb pty- fis, ip sb blk, arg thru,
tr cal incl- lse cal, rr pyr: SH (20%): dk gy- blk, sme
gy- brn mot, blk, hd, sme mod calc, mly; CHK
(20%): pred med- dk gy, ip lt gy, offwh- bf- tn mot,
frm- sl hd, sme sl frm, pred sb blk, pred mod arg,
mly intbds thru, occ calc incl

10100-10160 MRLST (60%): dk gy, ip sl blk, sme
bf- gy mot, pred hd, sb pty- fis, ip sb blk, arg thru,
tr cal incl- lse cal, rr pyr: SH (20%): dk gy- blk,
sme gy- brn mot, blk, hd, sme mod calc, mly;
CHK (20%): pred med- dk gy, ip lt gy, offwh- bf- tn
mot, frm- sl hd, sme sl frm, pred sb blk, pred
mod arg, mly intbds thru, occ calc incl

10160-10220 MRLST (60%): dk gy, ip sl blk, sme
bf- gy mot, pred hd, sb pty- fis, ip sb blk, arg thru,
tr cal incl- lse cal, rr pyr: SH (20%): dk gy- blk,
sme gy- brn mot, blk, hd, sme mod calc, mly;
CHK (20%): pred med- dk gy, ip lt gy, offwh- bf- tn
mot, frm- sl hd, sme sl frm, pred sb blk, pred
mod arg, mly intbds thru, occ calc incl



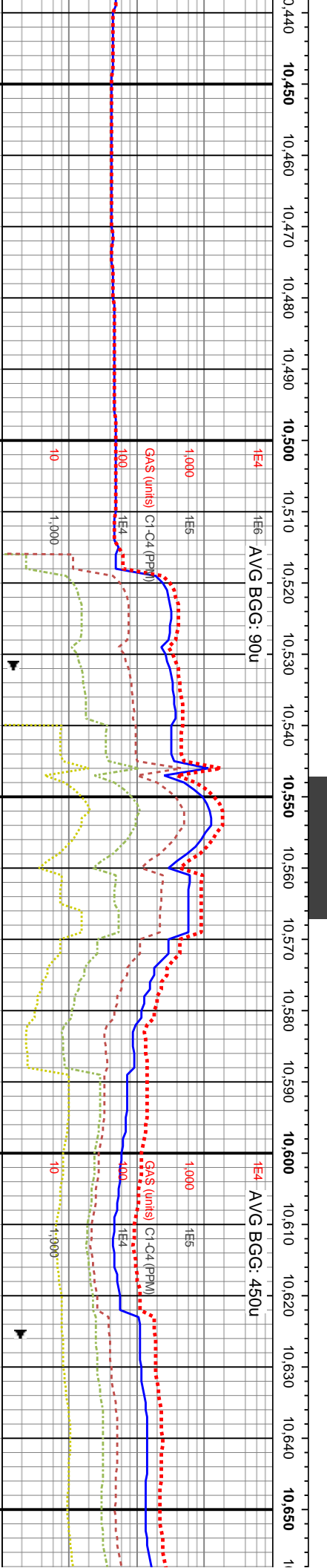
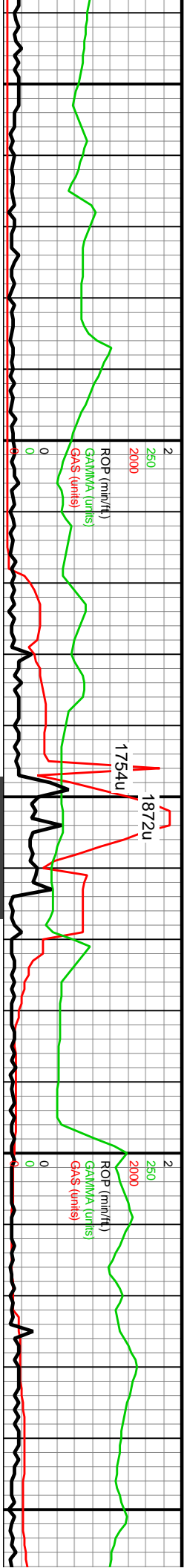


MD: 10,282'
Inclination: 89.76°
Azimuth: 269.79°
TVD: 6,997.19'
VS: 2,887.66'

MD: 10,377'
Inclination: 90.6°
Azimuth: 270.48°
TVD: 6,996.89'
VS: 2,982.66'

10220-10280 CHK (65%): pred med- gy, ip lt gy, sme brn, offwht- bf- tn mot, frm- sl hd, sme sl frm, pred sb blk, pred sl- mod arg, mrlly intbds thru, occ calc incl, tr frac fl cal, rr pyr; MRLST (25%): dk gy, ip sl blk, sme bf- gy mot, pred hd, sb ply- fis, ip sb blk, arg thru, tr cal incl- lse cal, rr pyr; SH (10%): dk gy- blk, sme gy mot, blk, hd- frm, sl calc, mrlly	10280-10340 CHK (75%): pred med- gy, ip lt gy, sme brn, offwht- bf- tn mot, frm- sl hd, sme sl frm, pred sb blk, pred sl- mod arg, mrlly intbds thru, occ calc incl, tr frac fl cal, rr pyr; MRLST (15%): dk gy, ip sl blk, sme bf- gy mot, pred hd, sb ply- fis, ip sb blk, arg thru, tr cal incl- lse cal, rr pyr; SH (10%): dk gy- blk, sme gy mot, blk, hd- frm, sl calc, mrlly	10340-10400 CHK (85%): pred gy, ip lt gy- brn, offwht- bf- tn mot thru, frm- sl hd, sme sl frm, pred sb blk, pred sl- mod arg, occ mrlly intbds thru, occ calc incl, tr frac fl cal, rr pyr; MRLST (15%): dk gy, ip sl blk, sme bf- gy mot, pred hd, sb ply- fis, ip sb blk, arg thru, tr cal incl	10400-10460 CHK (85%): brn, offwht- bf- tn mot thru, frm- sl blk, pred sb blk, pred sl- mod arg, occ calc incl, MRLST (15%): dk gy, ip mot, pred hd, sb ply- fis, thru, tr cal incl
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MD: 10,471' WOB: 42Klbs
Inclination: 89.5° ay: 65RPM
Azimuth: 269.86° kes: 220SPM
TVD: 6,996.81"ump Rate: 639GPM
VS: 3,076.66'

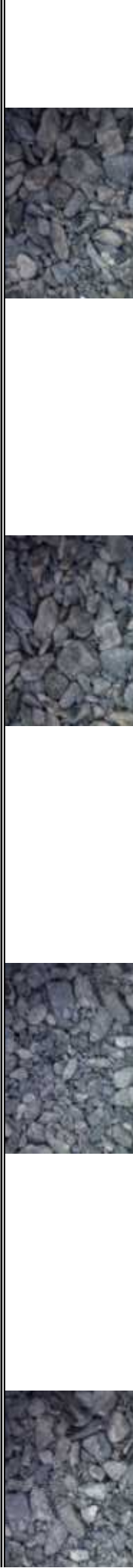
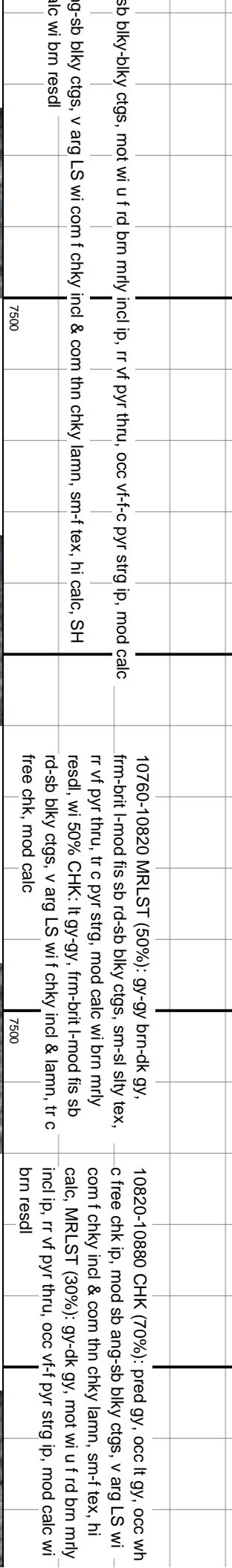
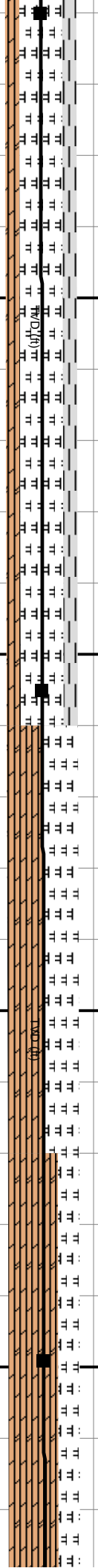
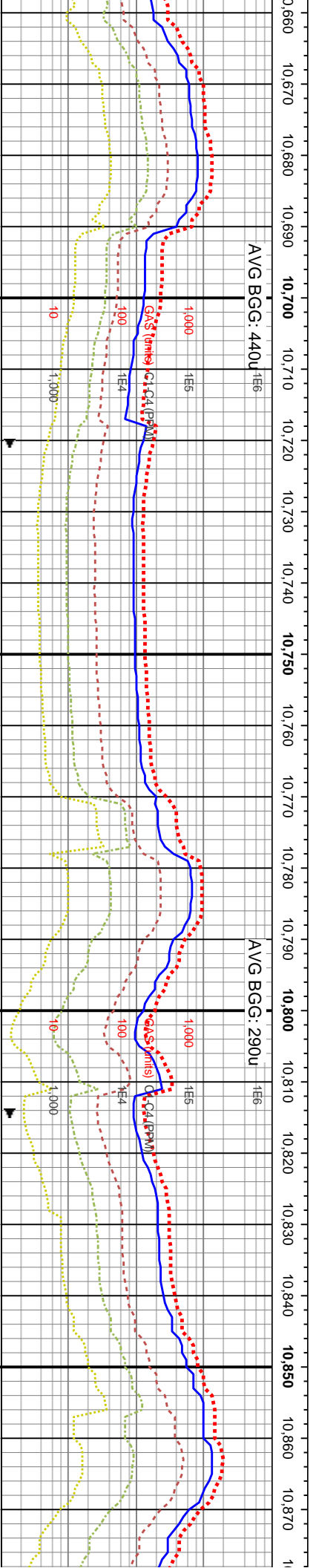
MD: 10,566'
Inclination: 90.67°
Azimuth: 269.31°
TVD: 6,996.66'
VS: 3,171.65'

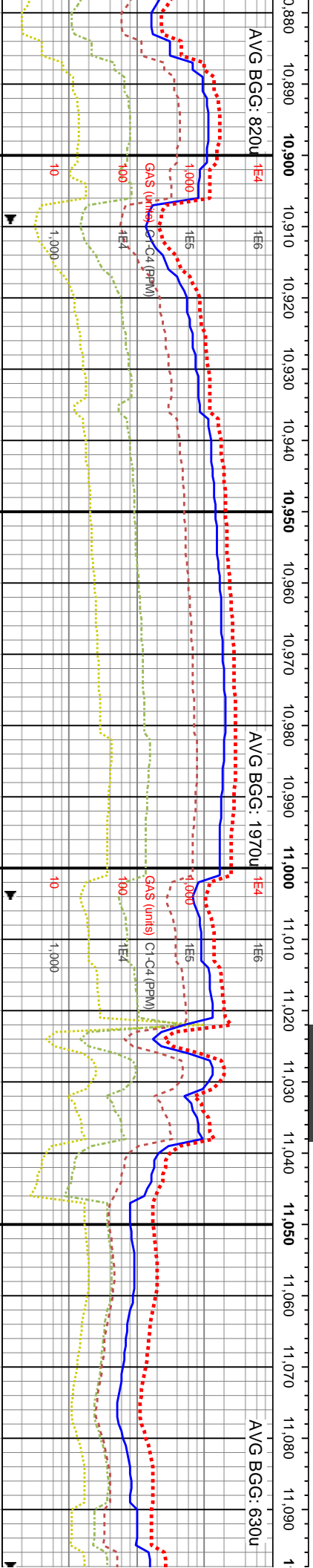
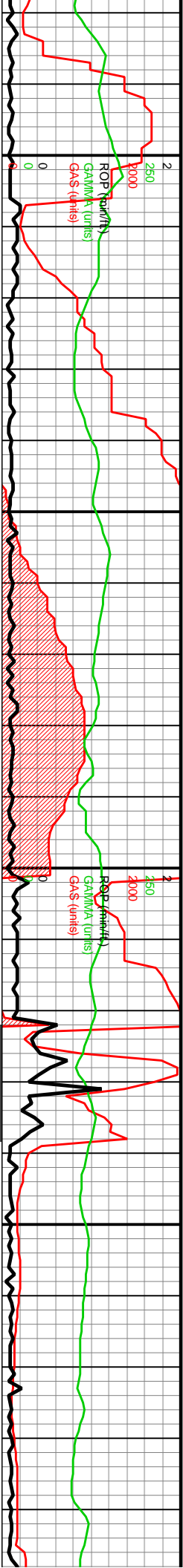
MD: 10
Inclinat
Azimut
TVD: 6
VS: 3,2

); pred gy, ip lt gy-
u, frm- sl hd, sme
sl- mod arg, mly
tr frac fl cal, rr pyr;
sl blk, sme bf- gy
ip sb blkly, arg

10460-10580 CHK (70%): pred gy, occ lt gy, occ wh c free chk ip, mod sb ang-sb blkly
cigs, v arg LS wi com f chky incl & com thn chky lamm, sm-f tex, hi calc, MRLST (30%):
gy-dk gy, mot wi u f rd brn mly incl ip, rr vf pyr thru, occ vf-f pyr strg ip, mod calc wi brn
resdl

10580-10760 MRLST (60%): gy-gy brn-dk gy, frm-brit mod fis
wi brn resdl,
CHK (20%): pred gy, occ lt gy, occ wh c free chk ip, mod sb ar
(20%): gy-gy brn, mod fis sb ang cigs, frm-brit, slty tex, mod ce





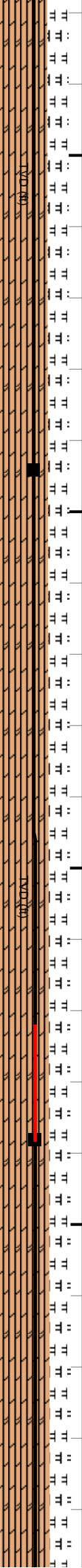
6500

6500

MD: 10,944'
Inclination: 90.81°
Azimuth: 268.3°
TVD: 6,986.69'
VS: 3,546.11'

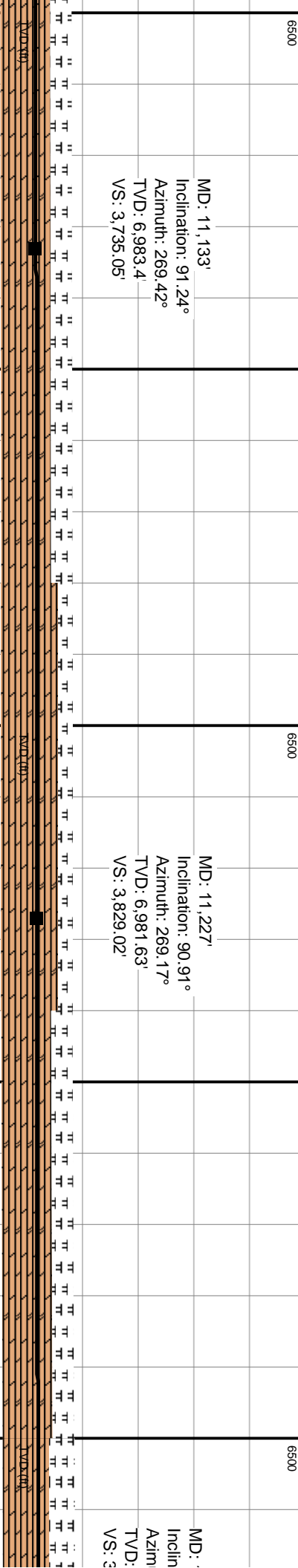
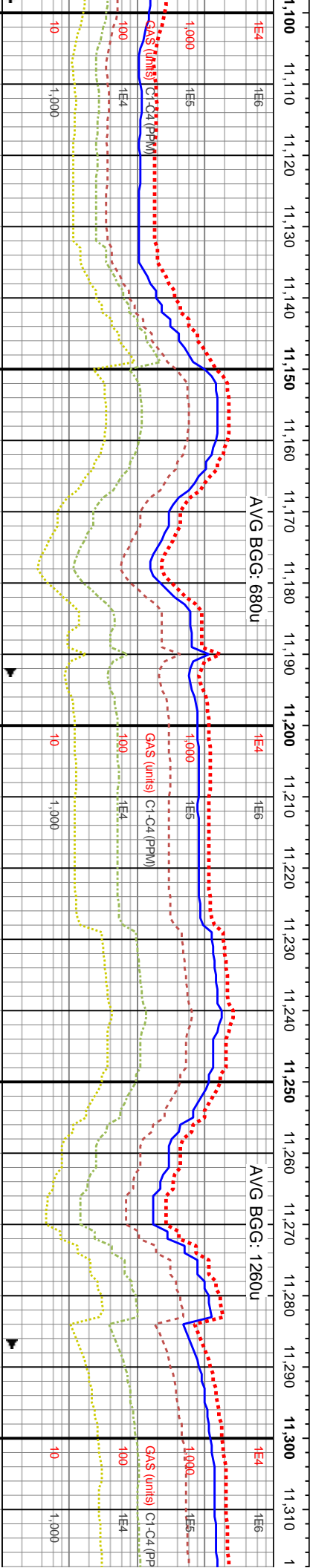
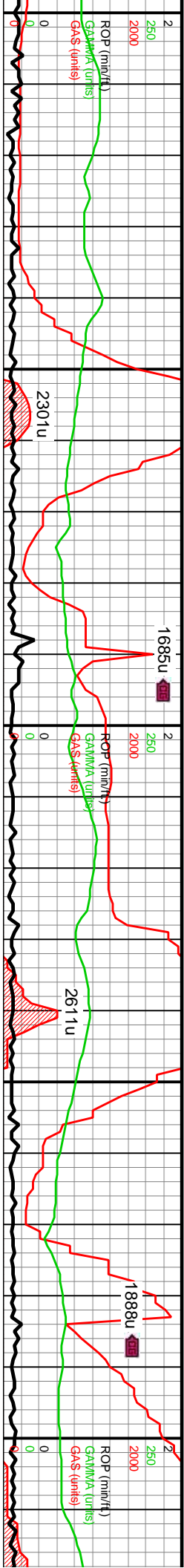
WOB: 40Klbs
Rotary: 65RPM
Strokes: 220SPM
Pump Rate: 639GPM

MD: 11,038'
Inclination: 90.97°
Azimuth: 269.46°
TVD: 6,985.23'
VS: 3,640.08'



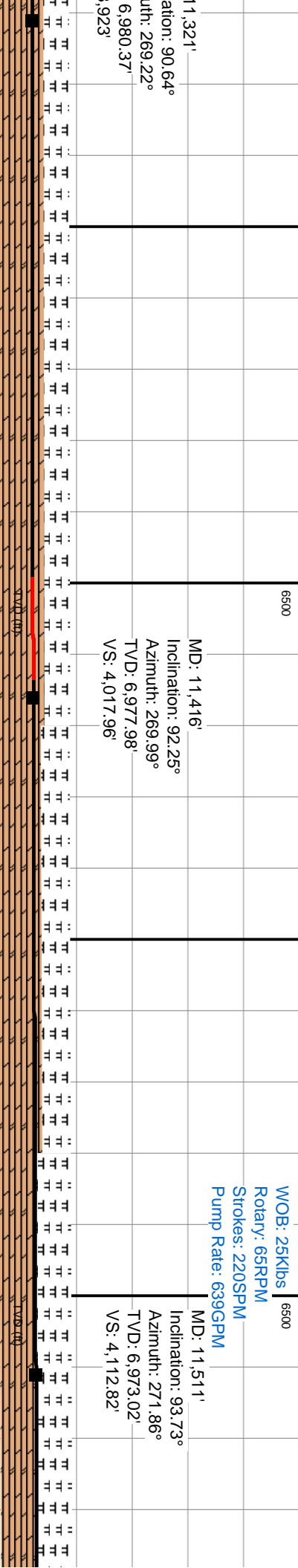
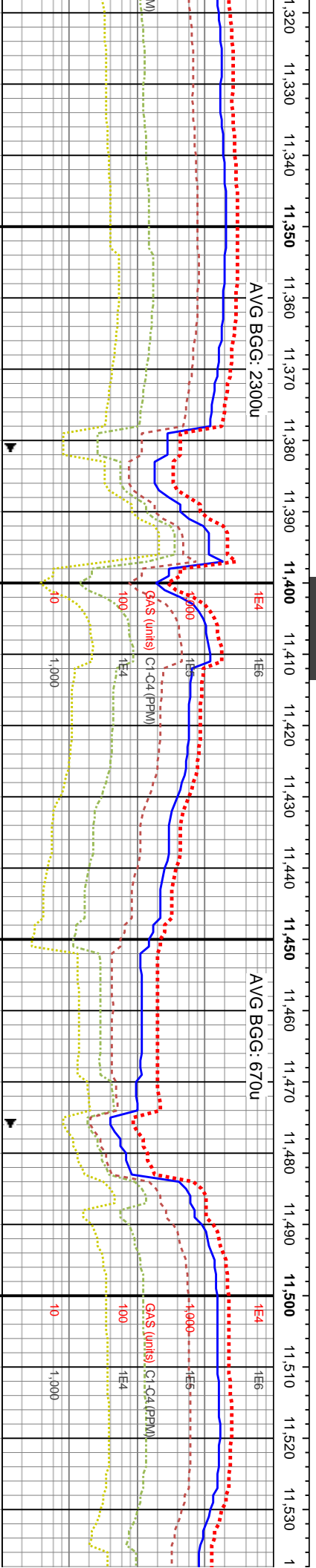
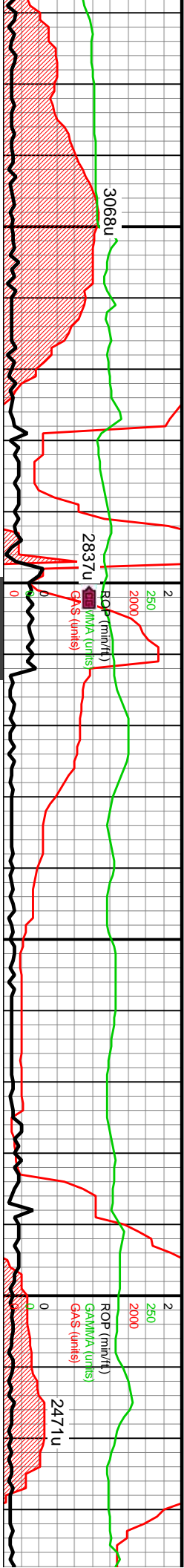
10880-10940 CHK (70%): lt gy-gy, frm-brit l-mod fis sb rd-sb blkly ctgs, v arg LS wi f chky incl & lamm, tr c free chk, mod calc, MRLST (30%): gy-gy brn-dk gy, frm-brit l-mod fis sb rd-sb blkly ctgs, sm-sl silty tex, rr vf pyr thru, tr c pyr stng, mod calc wi brn mrlly resd	10940-11000 CHK (70%): pred gy, occ lt gy, occ wh c free chk ip, mod sb ang-sb blkly ctgs, v arg LS wi com f chky incl & com thn chky lamm, sm-f tex, hi calc, MRLST (30%): gy-dk gy, mot wi u f rd brn mrlly incl ip, rr vf pyr thru, occ vf-f pyr stng ip, mod calc wi brn resd	11000-11120 CHK (70%): lt gy-gy, frm-brit l-mod fis sb rd-sb blkly ctgs, v arg LS wi f lamm, tr c free chk wi f pyr stng ip, mod calc, MRLST (30%): gy-gy brn-dk gy, frm-brit rd-sb blkly ctgs, sm-sl silty tex, rr vf pyr thru, tr c pyr stng, mod calc wi brn mrlly resd
7500	7500	7500



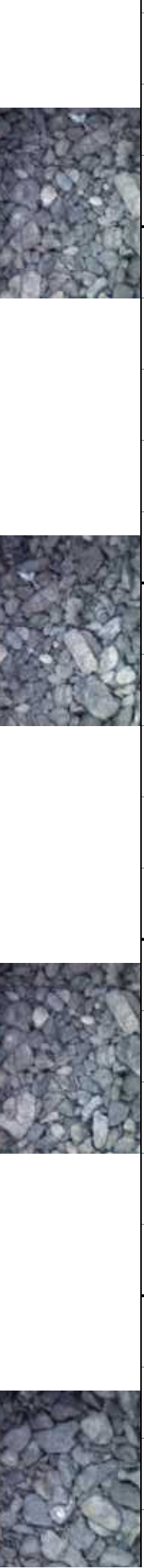


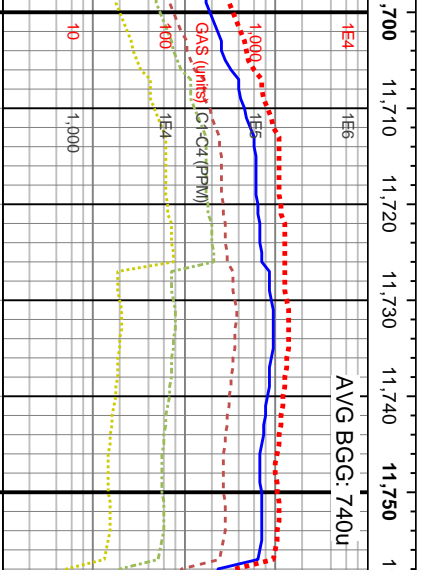
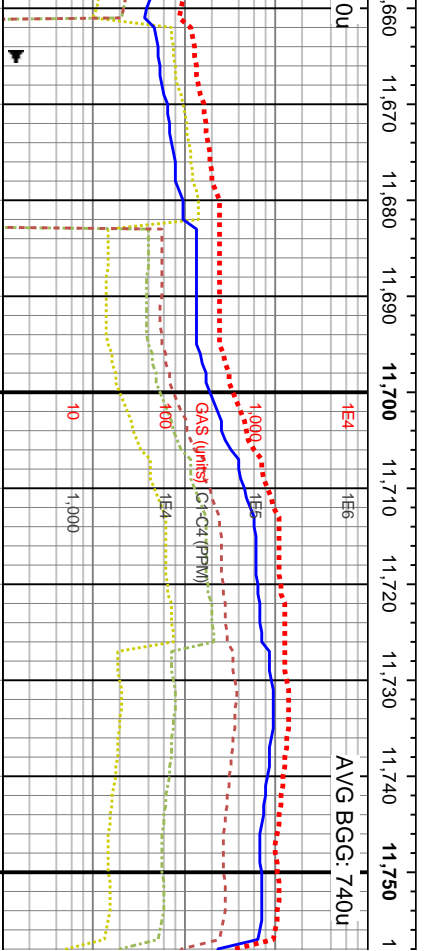
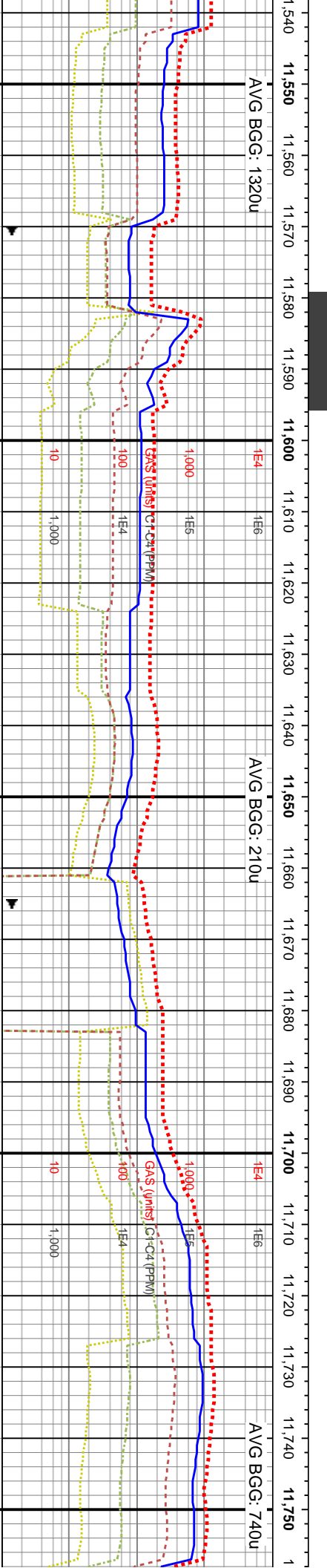
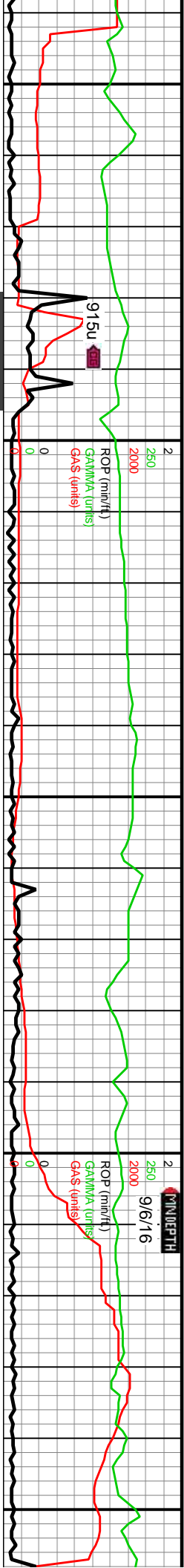
MD: 11,133' Inclination: 91.24° Azimuth: 269.42° TVD: 6,983.4 VS: 3,735.05'		11120-11180 CHK (70%): pred gy, occ lt gy, occ wh c free chk ip, mod sb ang-sb blk cyts, v arg LS wi com f chy incl & com thn chy lamm, sm-f tex, hi calc, MRLST (30%): gy-dk gy, mot wi u f rd brn mrly incl ip, rr vf pyr thru, occ vf-f pyr strg ip, mod calc wi brn resd	11180-11240 CHK (80%): lt gy-gy, occ c free chk ip, mod sb ang-sb blk cyts, v arg LS wi com f chy incl & com thn chy lamm, sm-f tex, hi calc, MRLST (20%): gy-dk gy, mot wi u f rd brn mrly incl ip, rr vf pyr thru, occ vf-f pyr strg ip, mod calc wi brn resd	11240-11300 CHK (70%): lt gy-gy, occ wh c free chk ip wi occ pyr strg, mod sb ang-sb blk cyts, v arg LS wi com f chy incl & com thn chy lamm, occ rr vf pyr, sm-f tex, hi calc, MRLST (30%): gy-dk gy, mot wi u f rd brn mrly incl ip, rr vf pyr thru, occ vf-f pyr strg ip, mod calc wi brn resd
MD: 11,227' Inclination: 90.91° Azimuth: 269.17° TVD: 6,981.63' VS: 3,829.02'				

chky incl & i-mod fis sb	7500				11300-11420 C	7500
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11,321'	MD: 11,416'	MD: 11,511'
Inclination: 92.25°	Inclination: 92.25°	Inclination: 93.73°
Azimuth: 269.99°	Azimuth: 269.99°	Azimuth: 271.86°
TVD: 6,977.98'	TVD: 6,977.98'	TVD: 6,973.02'
VS: 4,017.96'	VS: 4,017.96'	VS: 4,112.82'
11,320-11,340	11,340-11,420	11,420-11,540
CHK (60%): It gy-gy, frm-brit l-mod fis sb rd-sb blkly ctgs, v arg LS wi f chky incl & lamm, tr c free chk wi f pyr strg ip, mod calc. MRLST (40%): gy-gy brn-dk gy, frm-brit l-mod fis sb rd-sb blkly ctgs, sm-sltly tex, tr vf pyr thru, tr c pyr strg, mod calc wi brn mrlly resd	11,420-11,480	11,480-11,540
CHK (60%): It gy-gy, frm-brit l-mod fis sb rd-sb blkly ctgs, v arg LS wi f chky incl & lamm, tr c free chk wi f pyr strg ip, mod calc. MRLST (40%): gy-gy brn-dk gy, frm-brit l-mod fis sb rd-sb blkly ctgs, sm-sltly tex, tr vf pyr thru, tr c pyr strg, mod calc wi brn mrlly resd	CHK (60%): It gy-gy, frm-brit l-mod fis sb rd-sb blkly ctgs, v arg LS wi f chky incl & lamm, tr c free chk wi f pyr strg ip, mod calc. MRLST (40%): gy-gy brn-dk gy, frm-brit l-mod fis sb rd-sb blkly ctgs, sm-sltly tex, tr vf pyr thru, tr c pyr strg, mod calc wi brn mrlly resd	MRLST (50%): gy-dk gy, sl brn hue ip, frm brit l-mod fis sb rd-sb blkly ctgs, pred sm tex, tr vf pyr thru, tr c pyr strg, mod calc wi brn mrlly resd, CHK (50%): It gy-gy, frm-brit l-mod fis sb rd-sb blkly ctgs, v arg LS wi f chky incl & lamm, tr c free chk wi f pyr strg ip, mod calc
7500	7500	7500



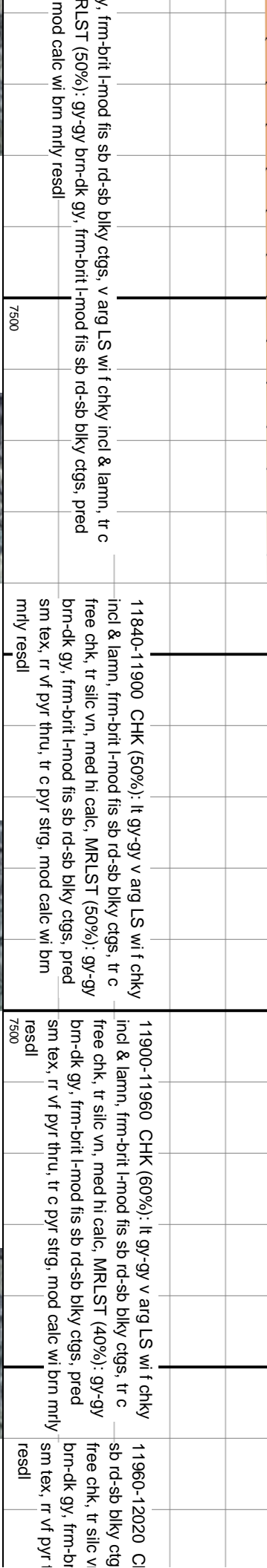
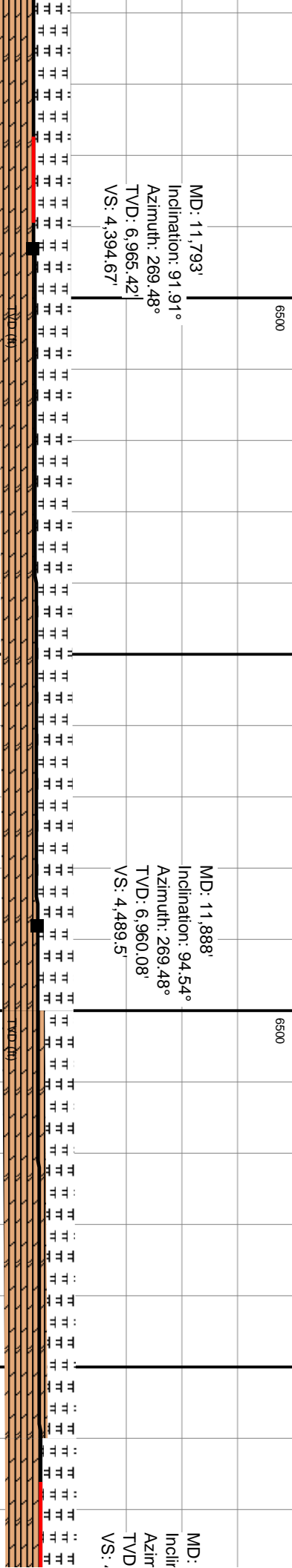
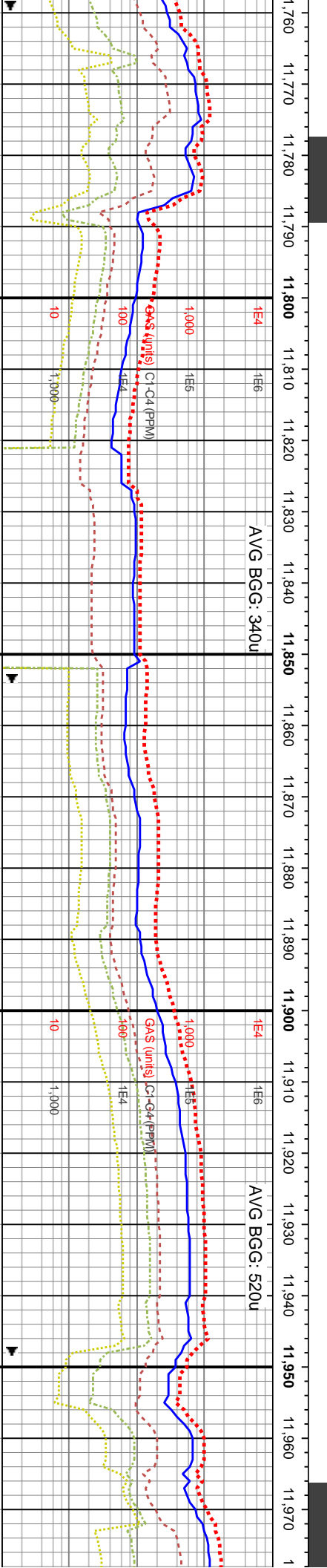
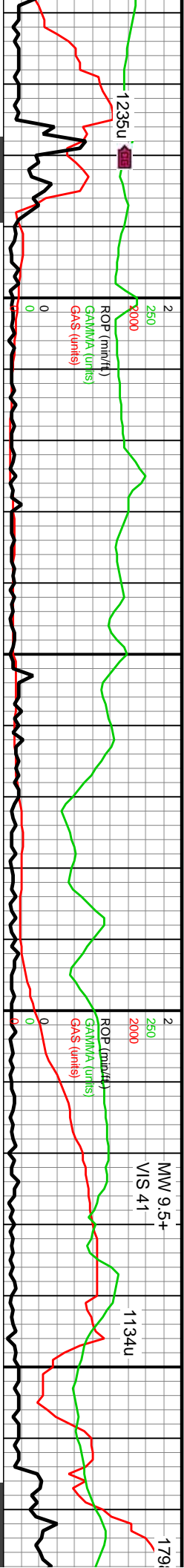


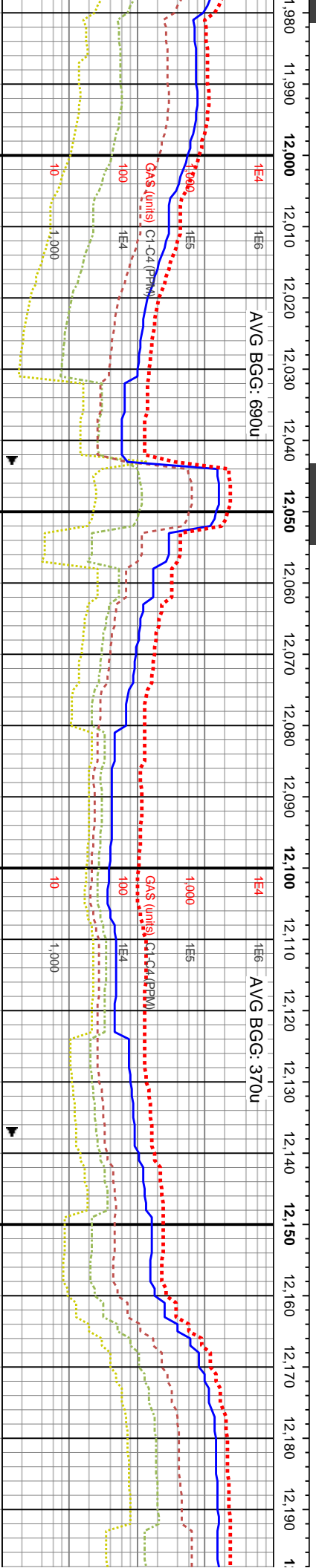
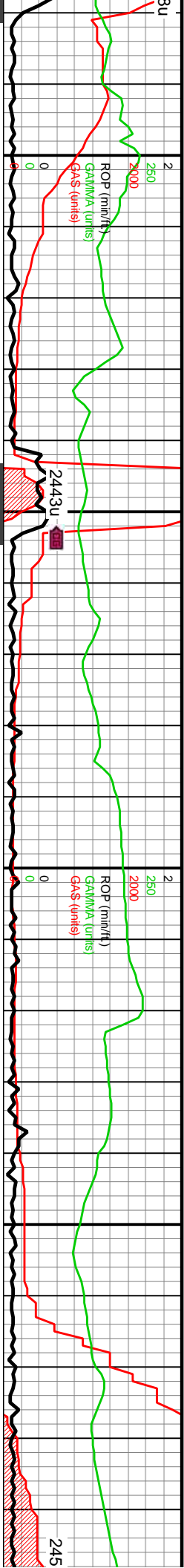
MD: 11,605'
Inclination: 91.24°
Azimuth: 270.45°
TVD: 6,968.94'
VS: 4,206.71'

MD: 11,699'
Inclination: 90.57°
Azimuth: 270.07°
TVD: 6,967.46'
VS: 4,300.69'

11540-11660 MRLST (60%): gy-gy brn-dk gy, frm brit l-mod fis sb rd-sb blk cy cigs, mot wi brn mrlly incl ip, pred sm tex, rr vf pyr thru, tr c pyr strg, mod calc wi brn mrlly resdl, CHK (40%): lt gy-gy, dk gy ip, frm-brit l-mod fis sb rd-sb blk cy cigs, v arg LS wi f chky incl & lamn, tr c free chk, mod calc	7500
11660-11720 MRLST (60%): gy-dk gy, sl brn hue ip, frm brit l-mod fis sb rd-sb blk cy cigs, pred sm tex, rr vf pyr thru, tr c pyr strg, mod calc wi brn mrlly resdl, CHK (40%): lt gy-gy, frm-brit l-mod fis sb rd-sb blk cy cigs, v arg LS wi f chky incl & lamn, tr c free chk wi f pyr strg ip, mod calc	7500
11720-11840 CHK (50%): lt gy-g free chk, tr silc vn, med hi calc, M sm tex, rr vf pyr thru, tr c pyr strg,	







WOB: 41Klbs
Rotary: 65RPM
Strokes: 216SPM
Pump Rate: 627GPM

ation: 93.56°
uth: 268.3°
6.953.37'
4.584.24'

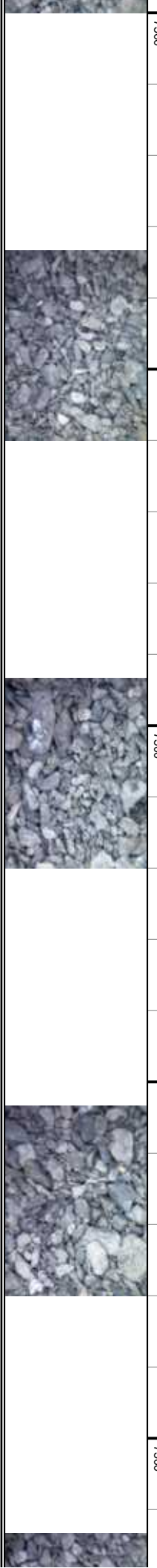
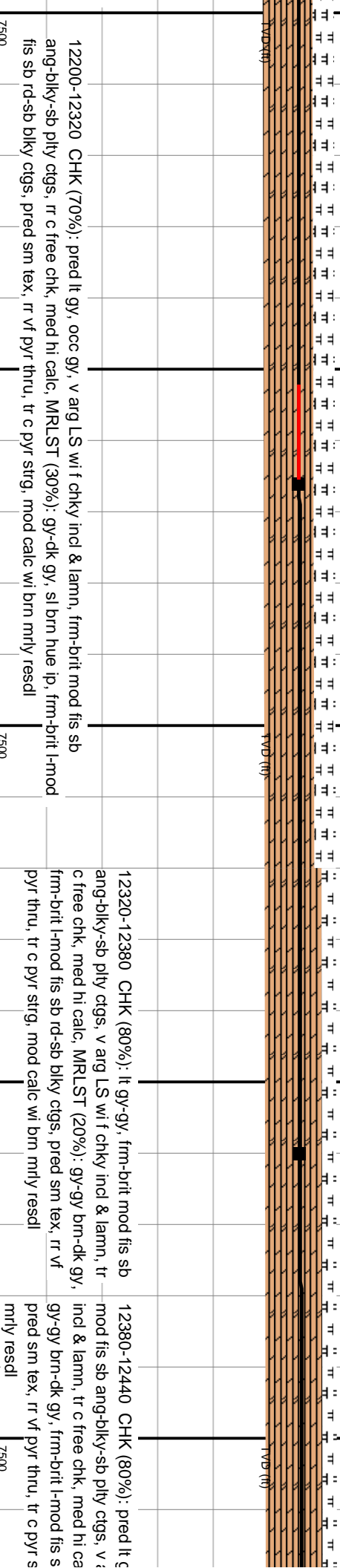
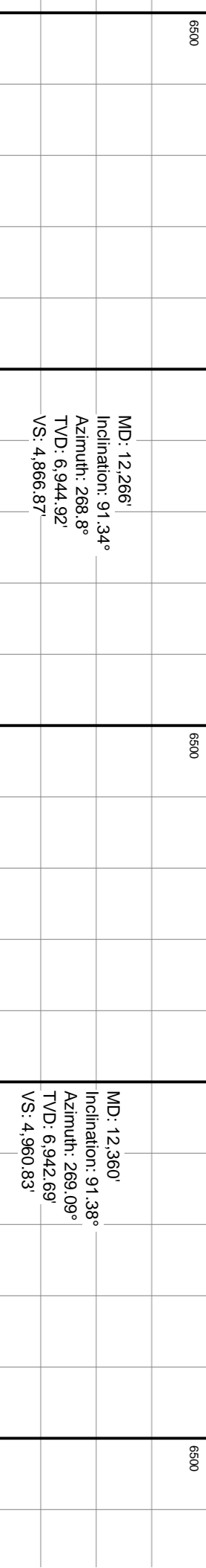
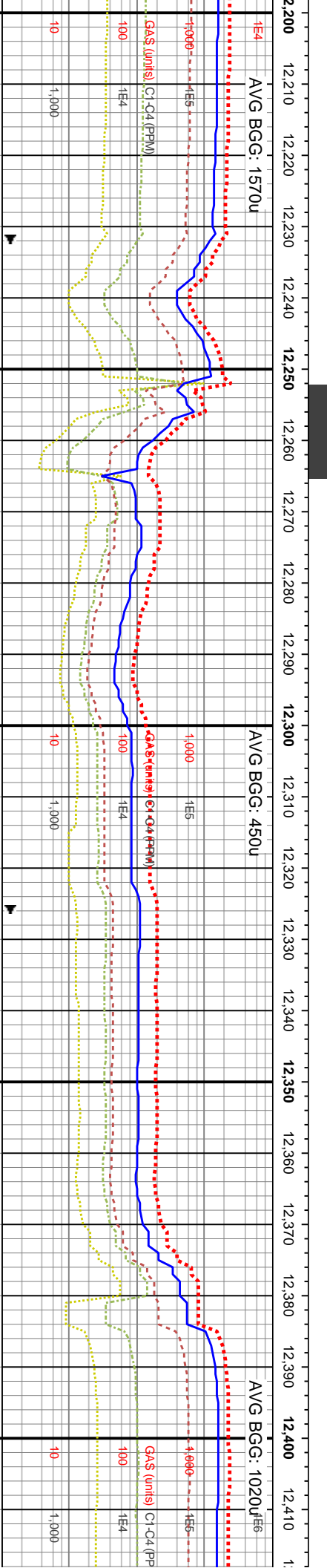
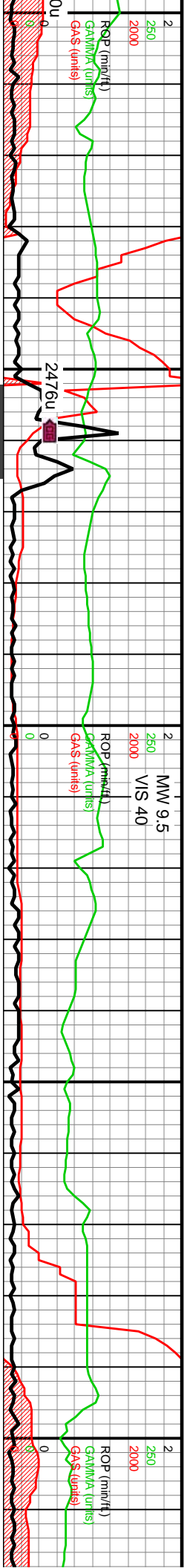
MD: 12.077'
Inclination: 91.68°
Azimuth: 267.78°
TVD: 6.949.07'
VS: 4.678.07'

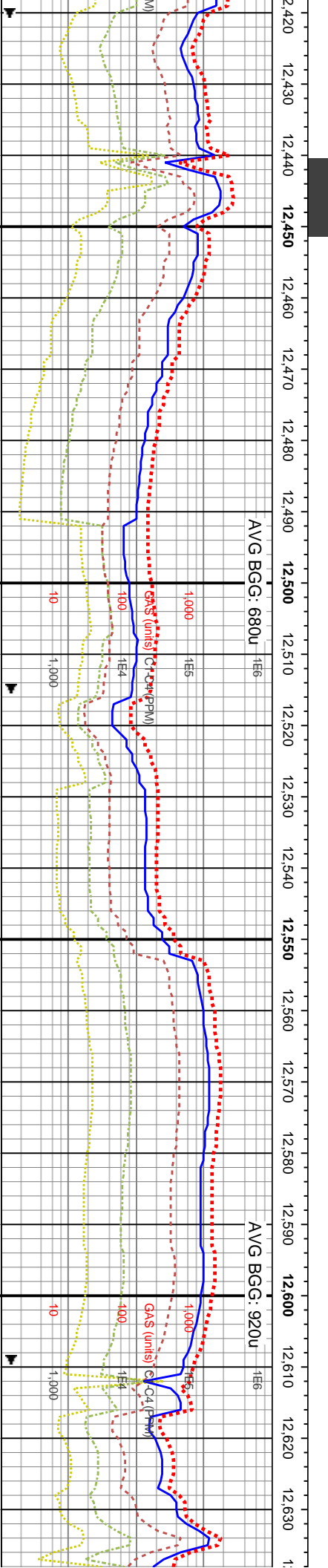
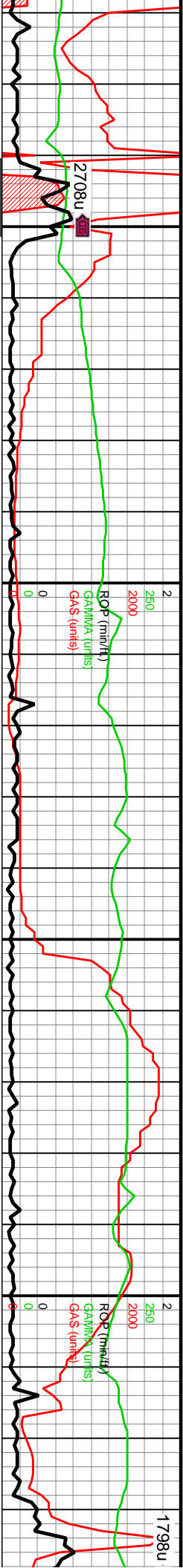
MD: 12.172'
Inclination: 91.01°
Azimuth: 267.52°
TVD: 6.946.84'
VS: 4.772.95'



12020-12080 CHK (60%): lt gy-gy, frm-brit l-mod fis	12080-12140 MRLST (60%): gy-dk gy, sl brn hue ip,	12140-12200 CHK (70%): lt gy-gy v arg LS wi f chky
ang-biky-sb ply ctgs, v arg LS wi f chky incl & lamn, tr c	frm brit l-mod fis sb rd-sb blkly ctgs, pred sm tex, rr vf	incl & lamn, frm-brit mod fis sb ang-biky-sb ply ctgs,
c free chk, med hi calc, MRLST (50%): gy-gy	pyr thru, tr c pyr strg, mod calc wi brn mrlly resdl, CHK	rr c free chk, med hi calc, MRLST (30%): gy-dk gy, sl
it l-mod fis sb rd-sb blkly ctgs, pred	(40%): lt gy-gy, frm-brit l-mod fis sb rd-sb blkly ctgs, v	brn hue ip, frm-brit l-mod fis sb rd-sb blkly ctgs, pred
thru, tr c pyr strg, mod calc wi brn mrlly	arg LS wi f chky incl & lamn, tr c free chk wi f pyr strg	sm tex, rr vf pyr thru, tr c pyr strg, mod calc wi brn
7500	7500	mrlly resdl





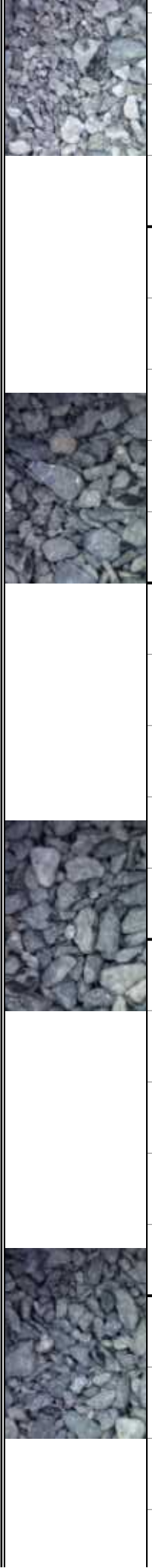


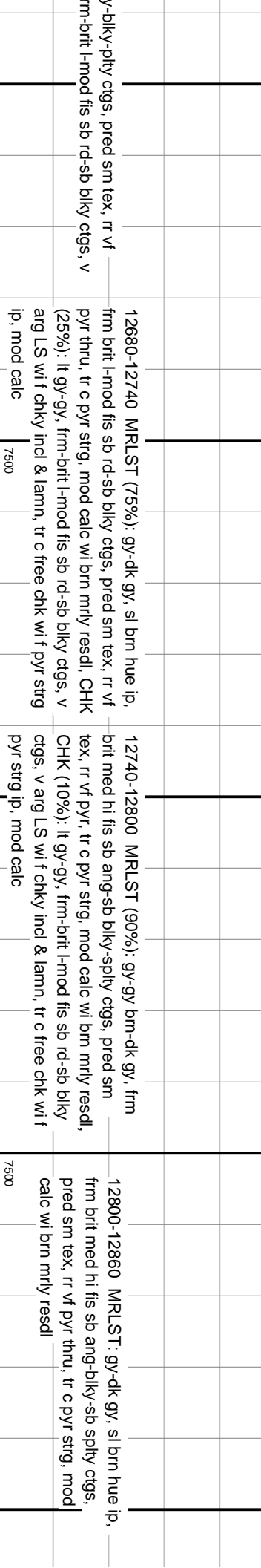
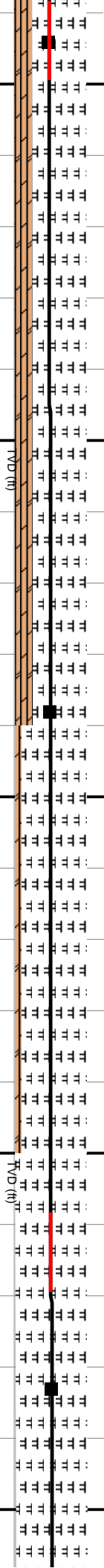
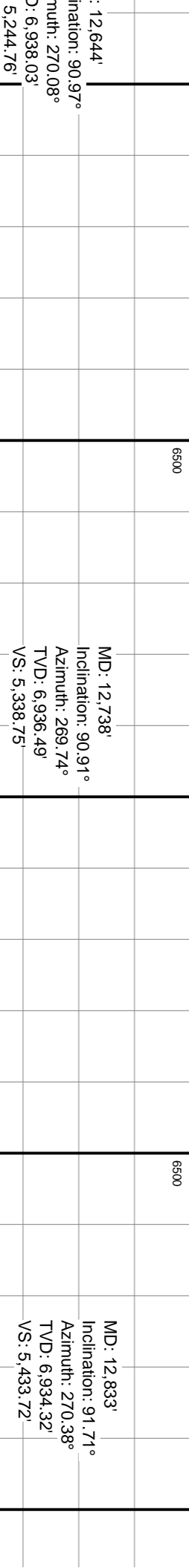
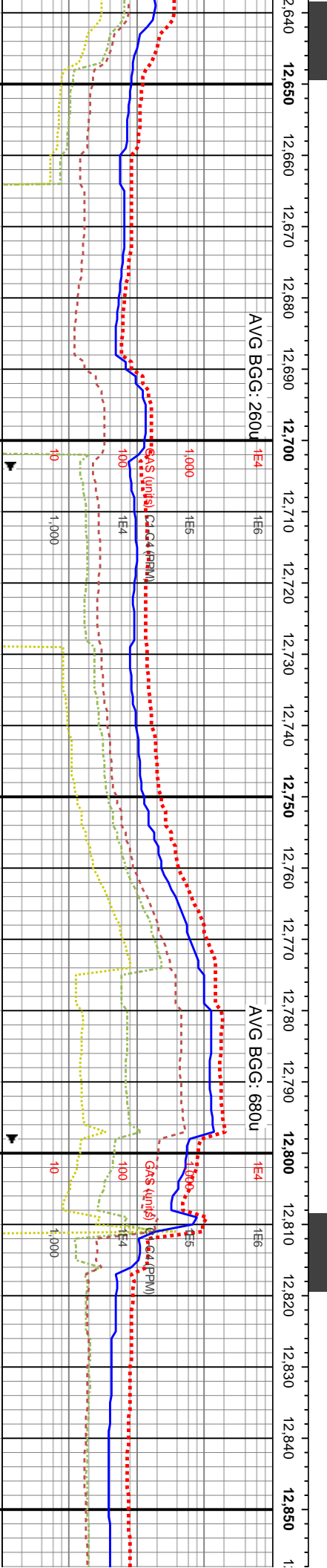
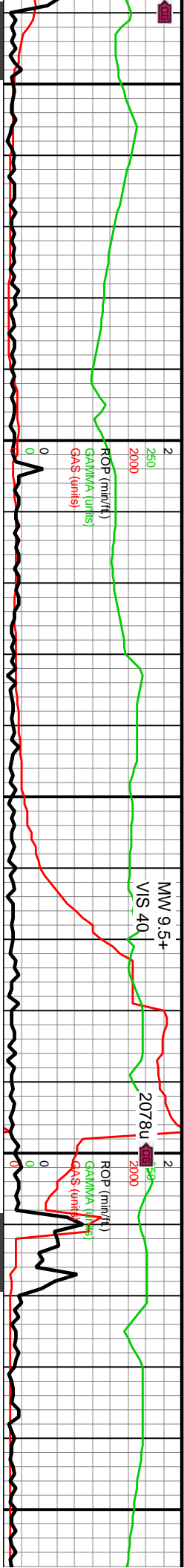
MD: 12,455'
Inclination: 90.94°
Azimuth: 269.24°
TVD: 6,940.77'
VS: 5,055.79'

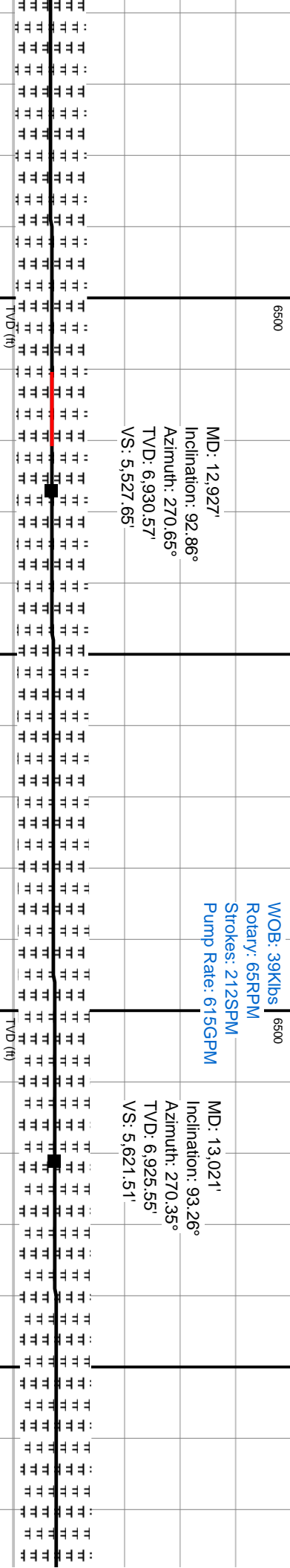
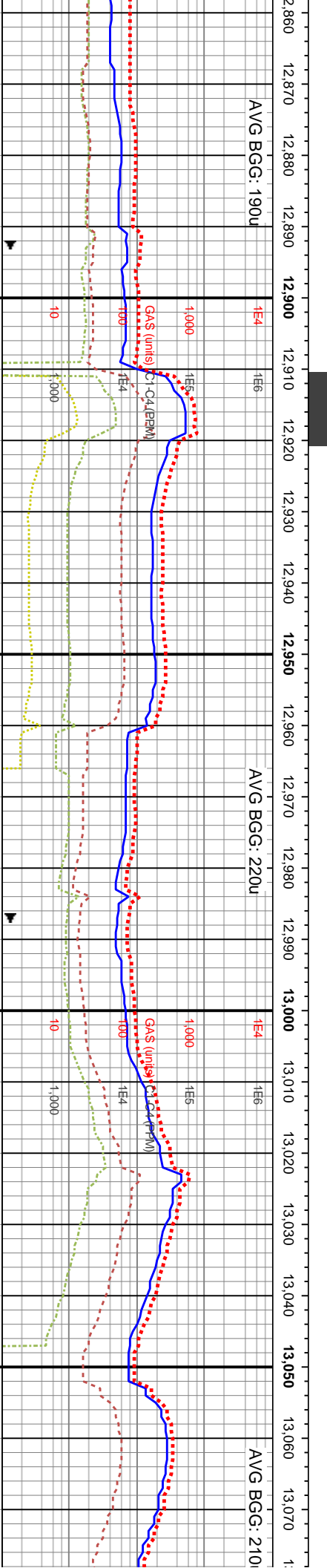
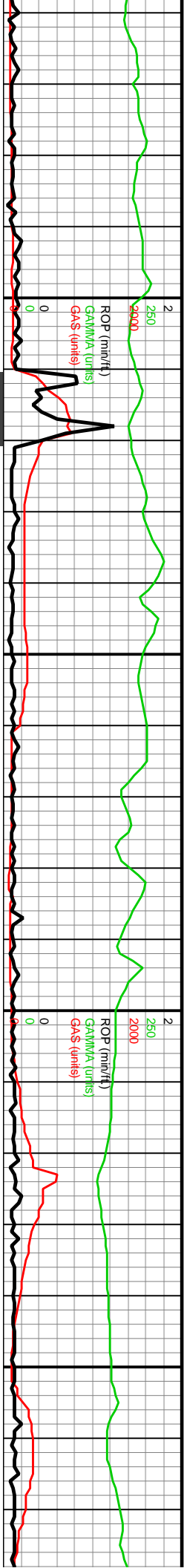
WOB: 37Klbs
Rotary: 65RPM
Strokes: 216SPM
Pump Rate: 626GPM

MD: 12,549'
Inclination: 90.7°
Azimuth: 269.65°
TVD: 6,939.42'
VS: 5,149.78'

12440-12500 CHK (60%): pred lt gy, occ gy, frm-brit mod fis sb ang-bkly-sb pty cigs, v arg LS wi f chky incl & lamm, tr c free chk, med hi calc, MRLST (40%): gy-gy brn-dk gy, frm-brit l-mod fis sb rd-sb blkly cigs, pred sm tex, rr vf pyr thru, tr c pyr strg, mod calc wi brn mfly	12500-12560 MRLST (60%): gy-dk gy, sl brn hue ip, frm brit l-mod fis sb rd-sb blkly cigs, pred sm tex, rr vf pyr thru, tr c pyr strg, mod calc wi brn mfly resdl, CHK (40%): lt gy-gy, frm-brit l-mod fis sb rd-sb blkly cigs, v arg LS wi f chky incl & lamm, tr c free chk wi f pyr strg ip, mod calc	12560-12680 MRLST (75%): gy-gy brn-dk gy, frm brit med hi fis sb blk pyr thru, tr c pyr strg, mod calc wi brn mfly resdl, CHK (25%): lt gy-gy, f arg LS wi f chky incl & lamm, tr c free chk wi f pyr strg ip, mod calc
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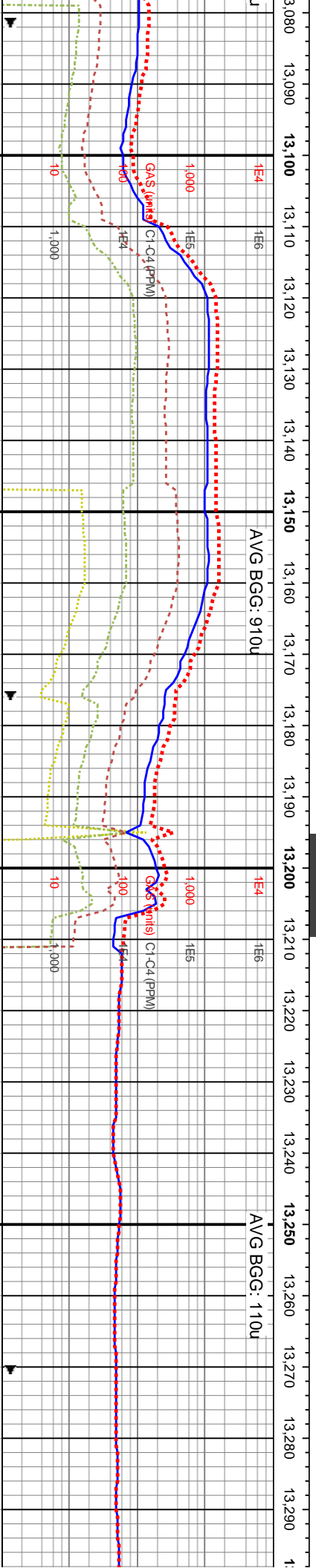
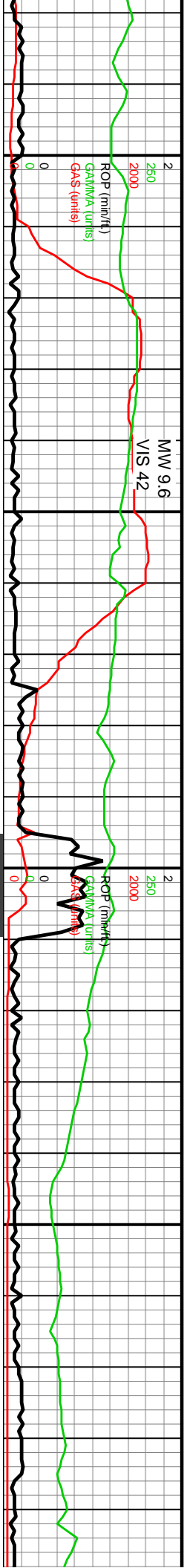


12860-12920 MRLST: gy-gy brn-dk gy, frm brit med hi fis sb ang-sb blkly-sply ctgs, pred sm tex, rr vf pyr, tr c pyr strg, mod calc wi brn mfly resd		12920-12980 MRLST: gy-dk gy, sl brn hue ip, frm brit med hi fis sb ang-blky-sb sply ctgs, pred sm tex, rr vf pyr thru, tr c pyr strg, mod calc wi brn mfly resd		12980-13100 MRLST (90%): gy-gy brn-dk gy, frm brit med hi fis sb ang-sb blkly-sply ctgs, sm tex, rr vf pyr, tr c pyr strg, mod calc wi brn mfly resd, CHK (10%): lt gy-gy, frm-brit rd-sb blkly ctgs, v arg LS wi f chky incl & lamn, tr c free chk wi f pyr strg ip, mod calc	
7500		7500		7500	

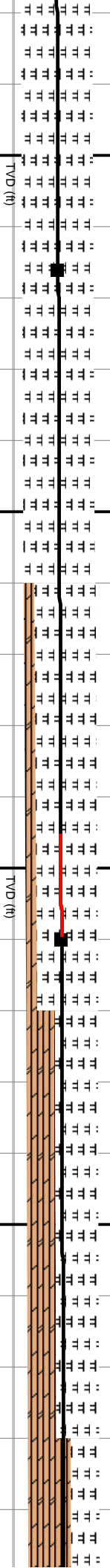
MD: 12,927'
Inclination: 92.86°
Azimuth: 270.65°
TVD: 6,930.57'
VS: 5,527.65'

WOB: 39klbs
Rotary: 65RPM
Strokes: 21SPM
Pump Rate: 615GPM

MD: 13,021'
Inclination: 93.26°
Azimuth: 270.35°
TVD: 6,925.55'
VS: 5,621.51'

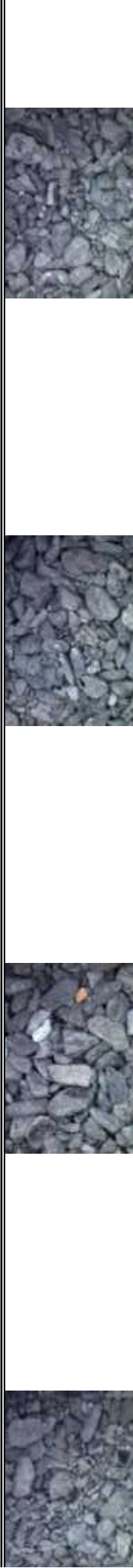
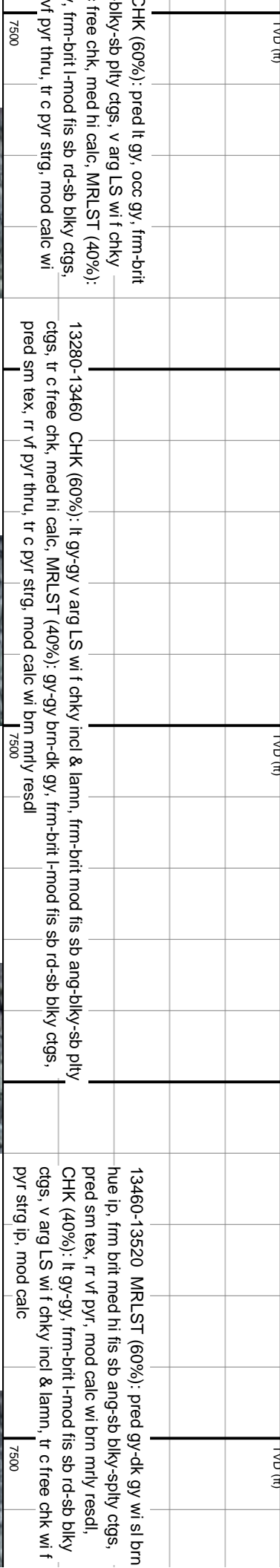
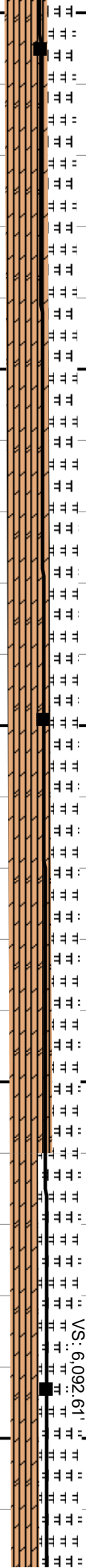
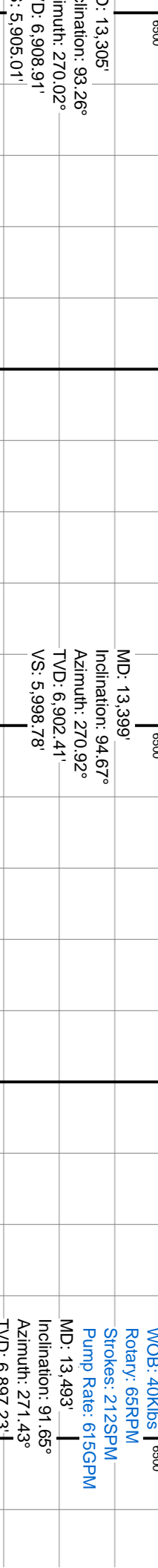
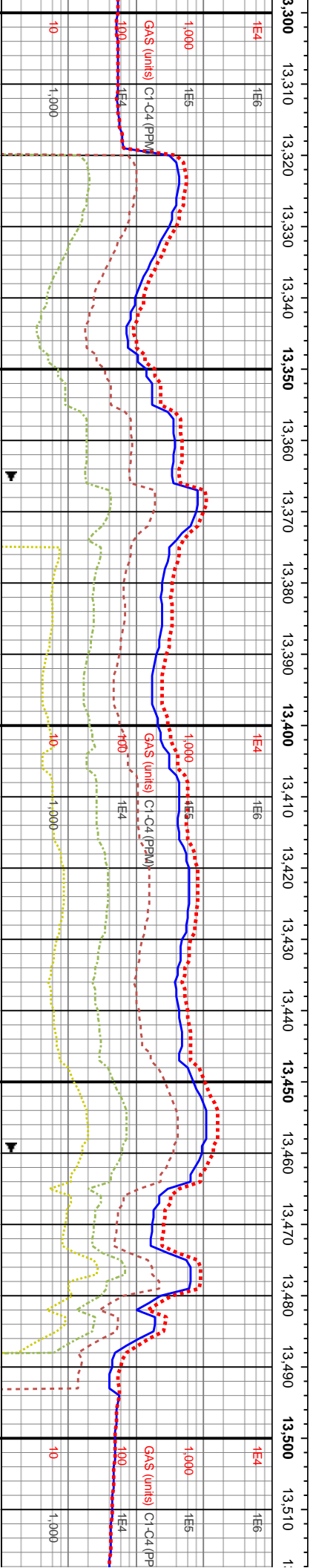
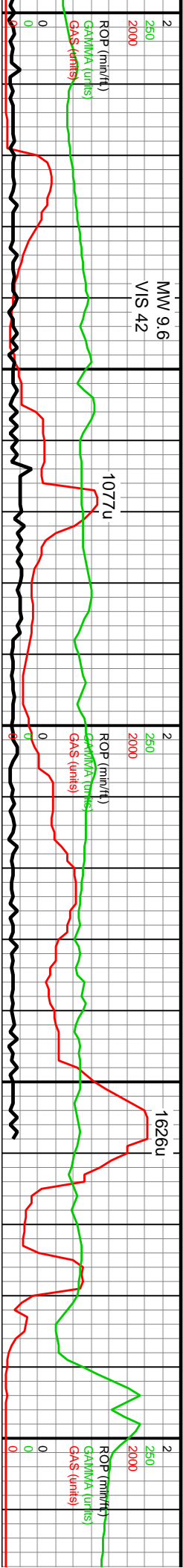


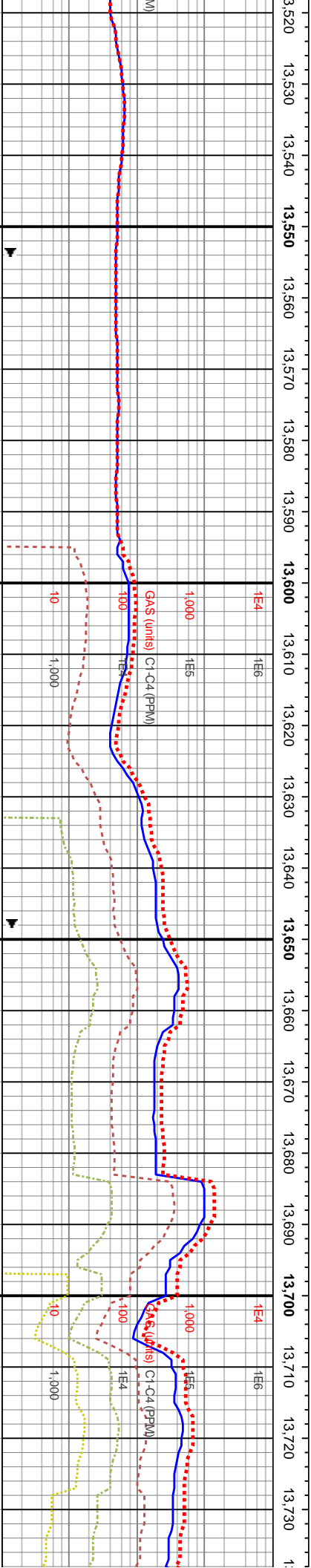
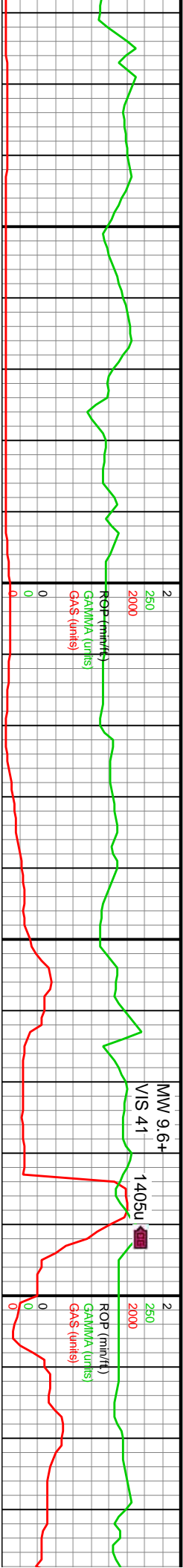
MD: 13,116'
Inclination: 94.13°
Azimuth: 270.34°
TVD: 6,919.43'
VS: 5,716.31'



13100-13160 MRLST (90%): pred gy-dk gy, occ brn hue ip, frm brit med hi fis sb ang-sb blkly-sply ctgs, pred sm tex, rr vf pyr, rr chkly incl ip, mod calc wi brn mrlly resdl. CHK (10%): lt gy-gy, frm-brit l-mod fis sb rd-sb blkly ctgs, v arg LS wi f chkly incl & lamm, tr c free chk wi f pyr strg ip, mod calc	7500
13160-13220 MRLST (85%): gy-gy brn-dk gy, frm brit med hi fis sb ang-sb blkly-sply ctgs, pred sm tex, rr vf pyr, tr c pyr strg, mod calc wi brn mrlly resdl, CHK (15%): lt gy-gy, frm-brit l-mod fis sb rd-sb blkly ctgs, v arg LS wi f chkly incl & lamm, tr c free chk wi f pyr strg ip, mod calc	7500
13220-13280 MRLST (60%): pred gy-dk gy wi sl brn hue ip, frm brit med hi fis sb ang-sb blkly-sply ctgs, pred sm tex, rr vf pyr, mod calc wi brn mrlly resdl, CHK (40%): lt gy-gy, frm-brit l-mod fis sb rd-sb blkly ctgs, v arg LS wi f chkly incl & lamm, tr c free chk wi f pyr strg ip, mod calc	
13280-13340 () mod fis sb ang- incl & lamm, tr c gy-gy brn-dk gy pred sm tex, rr brn mrlly resdl	







MD: 13,588'
Inclination: 91.04°
Azimuth: 271.3°
TVD: 6,895'
VS: 6,187.57'

MD: 13,682'
Inclination: 91.81°
Azimuth: 271.96°
TVD: 6,892.66'
VS: 6,281.5'



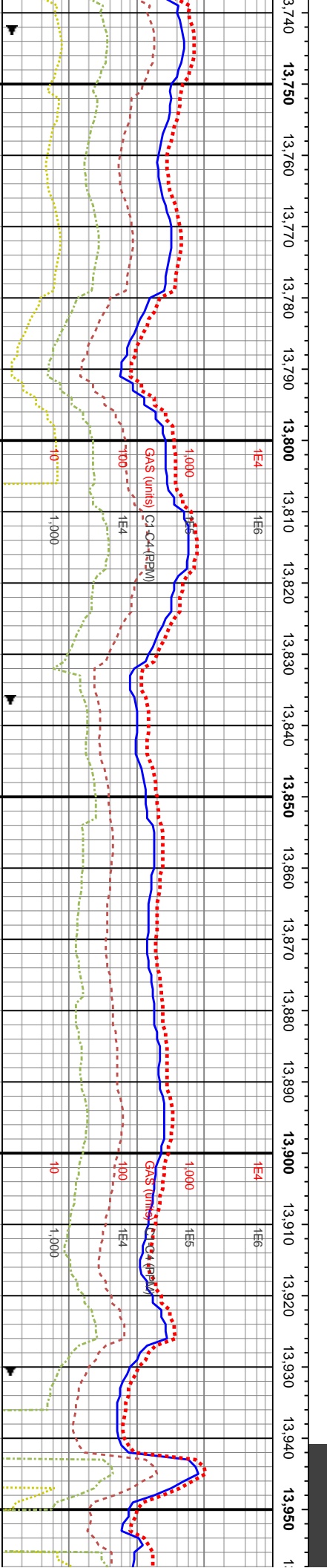
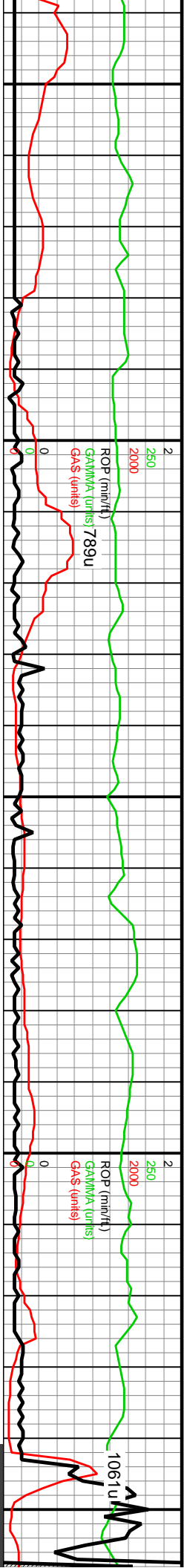
13520-13580 MRLST (70%): gy-dk gy wi sl brn hue ip, frm brit med hi fis sb ang-sb blkly-sply cigs, pred sm tex, rr vf pyr, mod calc wi brn mrlly resdl, CHK (30%); lt gy-gy, frm-brit l-mod fis sb rd-sb blkly cigs, v arg LS wi f chky incl & lamn, tr c free chk wi f pyr strg ip, mod calc

13580-13640 MRLST (75%): pred gy-dk gy wi sl brn hue ip, frm brit med hi fis sb ang-sb blkly-sply cigs, pred sm tex, rr vf pyr, mod calc wi brn mrlly resdl, CHK (25%); lt gy-gy, frm-brit l-mod fis sb rd-sb blkly cigs, v arg LS wi f chky incl & lamn, tr c free chk wi f pyr strg ip, mod calc

13640-13700 MRLST (75%): gy-gy brn-dk gy, frm brit med hi fis sb ang-sb blkly-sply cigs, pred sm tex, rr vf pyr, mod calc wi brn mrlly resdl, CHK (25%); lt gy-gy, frm-brit l-mod fis sb rd-sb blkly cigs, v arg LS wi f chky incl & lamn, tr c free chk wi f pyr strg ip, mod calc

13700-13760 MRLST (75%): pred brn hue ip, frm brit med hi fis sb ang-sb blkly-sply cigs, pred sm tex, rr vf pyr, mod calc wi brn mrlly resdl, CHK (25%); lt gy-gy, frm-brit l-mod fis sb rd-sb blkly cigs, v arg LS wi f chky incl & lamn, tr c free chk wi f pyr strg ip, mod calc





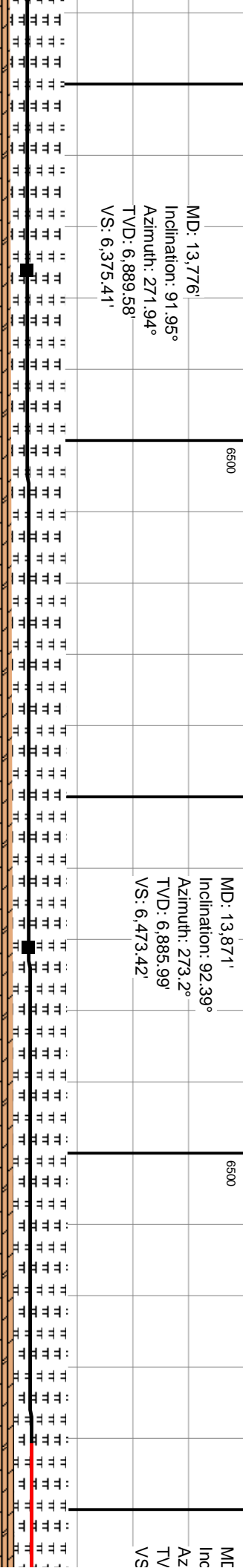
MD: 13,776'

Inclination: 91.95°

Azimuth: 271.94°

TVD: 6,889.58'

VS: 6,375.41'



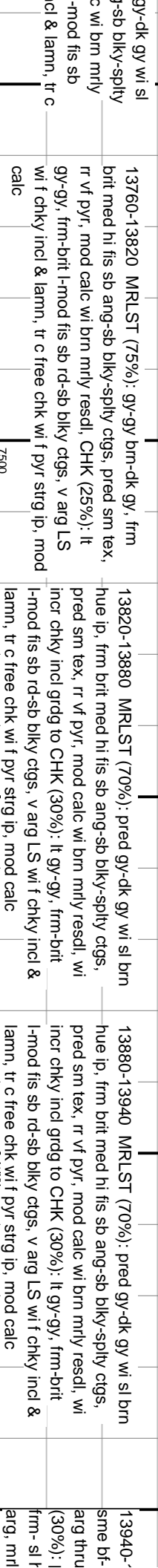
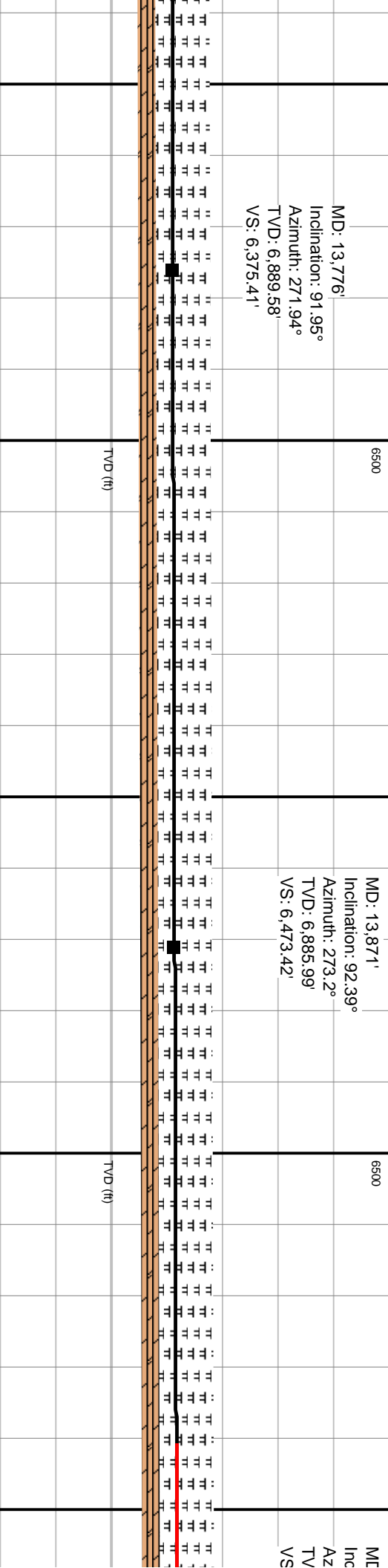
MD: 13,871'

Inclination: 92.39°

Azimuth: 273.2°

TVD: 6,885.99'

VS: 6,473.42'



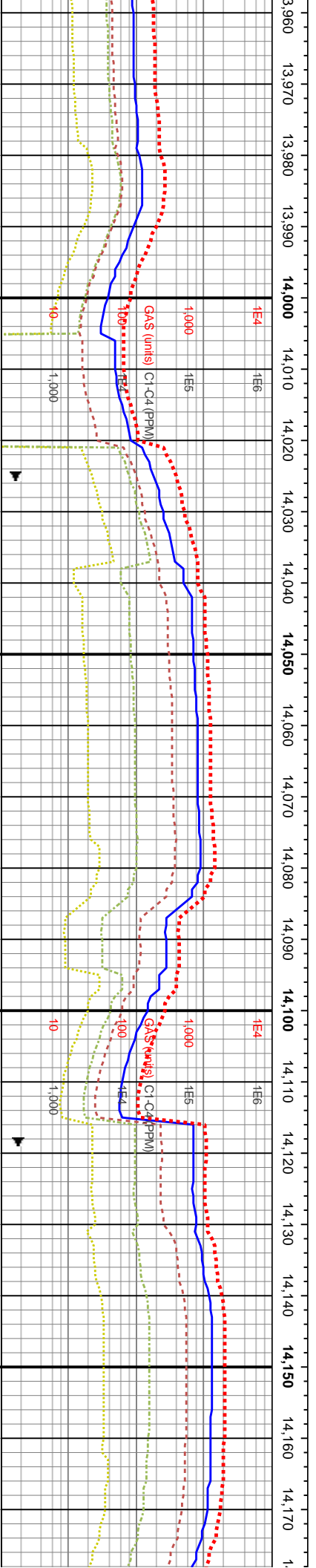
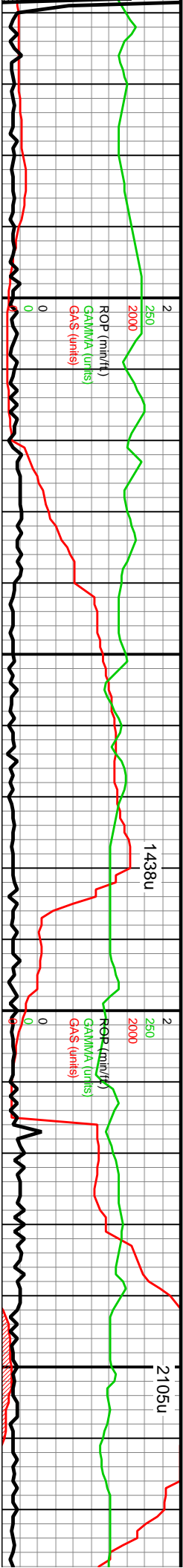
13760-13820 MRLST (75%): gy-gy brn-dk gy, frm brit med hi fis sb ang-sb blkly-sply ctgs, pred sm tex, rr vf pyr, mod calc wi brn mrlly resdl, CHK (25%): lt gy-gy, frm-brit l-mod fis sb rd-sb blkly ctgs, v arg LS wi f chky incl & lamn, tr c calc

13820-13880 MRLST (70%): pred gy-dk gy wi sl brn hue ip, frm brit med hi fis sb ang-sb blkly-sply ctgs, pred sm tex, rr vf pyr, mod calc wi brn mrlly resdl, wi incr chky incl grdg to CHK (30%): lt gy-gy, frm-brit l-mod fis sb rd-sb blkly ctgs, v arg LS wi f chky incl & lamn, tr c free chk wi f pyr strg ip, mod calc

13880-13940 MRLST (70%): pred gy-dk gy wi sl brn hue ip, frm brit med hi fis sb ang-sb blkly-sply ctgs, pred sm tex, rr vf pyr, mod calc wi brn mrlly resdl, wi incr chky incl grdg to CHK (30%): lt gy-gy, frm-brit l-mod fis sb rd-sb blkly ctgs, v arg LS wi f chky incl & lamn, tr c free chk wi f pyr strg ip, mod calc

13940-13950 MRLST (70%): pred gy-dk gy wi sl brn hue ip, frm brit med hi fis sb ang-sb blkly-sply ctgs, pred sm tex, rr vf pyr, mod calc wi brn mrlly resdl, wi incr chky incl grdg to CHK (30%): lt gy-gy, frm-brit l-mod fis sb rd-sb blkly ctgs, v arg LS wi f chky incl & lamn, tr c free chk wi f pyr strg ip, mod calc



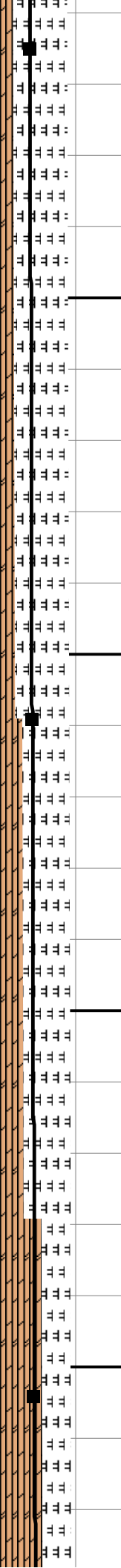


13.965' : 13.965' Inclination: 92.28°
271.47°
D: 6.882.16'
6.567.26'

6thWOB: 42Klbs
Rotary: 65RPM
Strokes: 210SPM
Pump Rate: 609GPM

DP MD: 14.059'
Inclination: 92.62°
Azimuth: 271.59°
TVD: 6,878.14'
VS: 6,661.14'

6500 MD: 14.154'
Inclination: 92.42°
Azimuth: 270.59°
TVD: 6,873.96'
VS: 6,756.03'



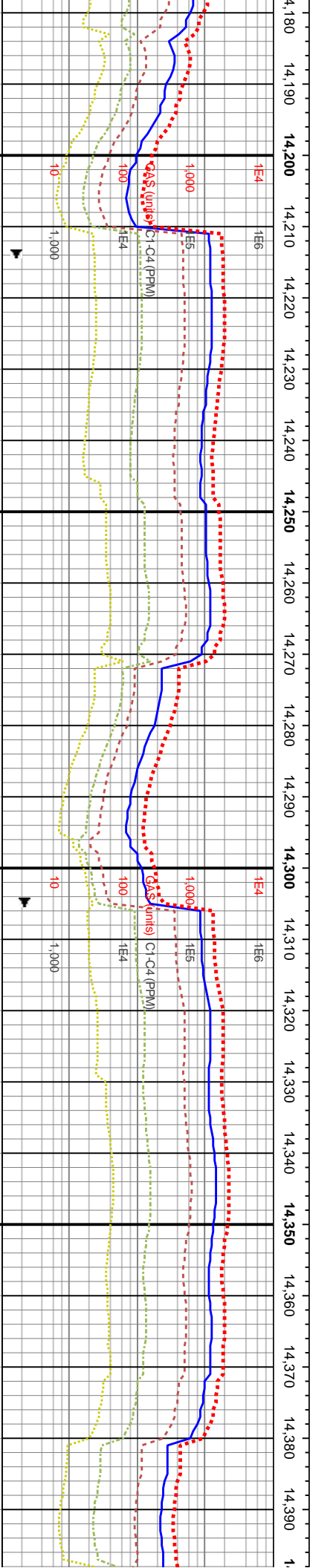
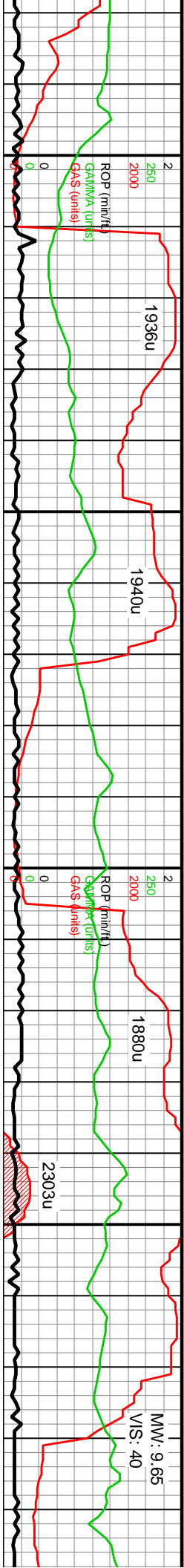
4000 MRLST (70%): dk gy- sl blk,
gy mot, pred hd, sb pty, ip sb blk,
sme cal incl, tr lse cal, tr bent; CHK
pred med- dk gy, offwht- bf- lt brn mot,
frm- sl frm, pred sb blk, pred mod
arg, mrlly intbds thru, occ calc incl, rr pyr

14000-14060 MRLST (70%): dk gy- sl blk,
sme bf- gy mot, pred hd, sb pty, ip sb blk,
arg thru, sme cal incl, tr lse cal, tr bent; CHK
(30%): pred med- dk gy, offwht- bf- lt brn mot,
frm- sl hd, sme sl frm, pred sb blk, pred mod
arg, mrlly intbds thru, occ calc incl, rr pyr

14060-14120 MRLST (65%): dk gy- sl blk,
sme bf- gy mot, pred hd, sb pty, ip sb blk,
arg thru, sme cal incl, tr lse cal, tr bent; CHK
(35%): pred med- dk gy, offwht- bf- lt brn mot,
frm- sl hd, sme sl frm, pred sb blk, pred mod
arg, mrlly intbds thru, occ calc incl, rr pyr

14120-14180 CHK (65%): pred med- gy, sme
lt brn, offwht- bf- lt brn mot, frm- sl hd, sme sl
frm, pred sb blk, pred mod arg, mrlly intbds
thru, occ calc incl, rr euhed cal rr pyr; MRLST
(35%): dk gy- sl blk, sme bf- gy mot, pred hd,
sb pty, ip sb blk, arg thru, sme cal incl, tr lse





MD: 14,248'
Inclination: 93.39°
Azimuth: 270.84°
TVD: 6,869.2
VS: 6,849.9

MD: 14,343'
Inclination: 95.18°
Azimuth: 270.98°
TVD: 6,862.1
VS: 6,944.62

TVD (ft)

TVD (ft)

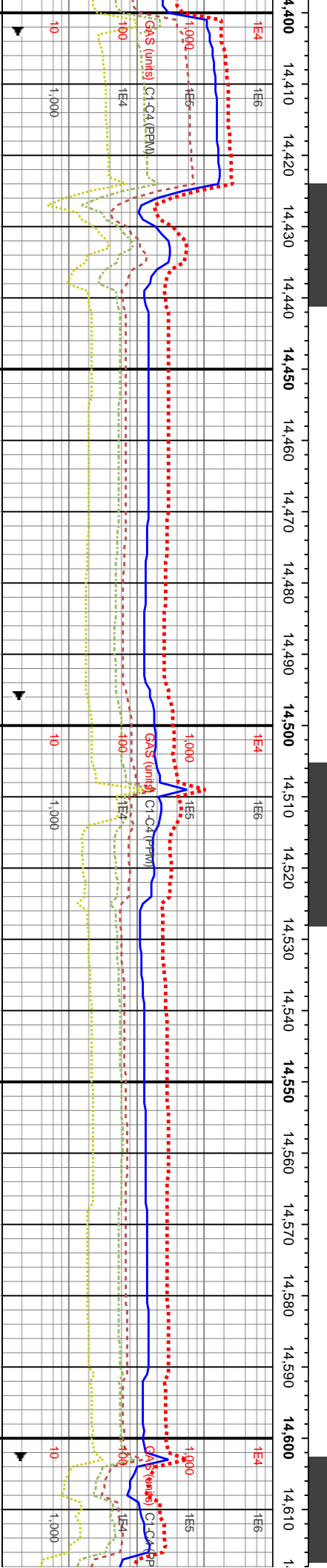
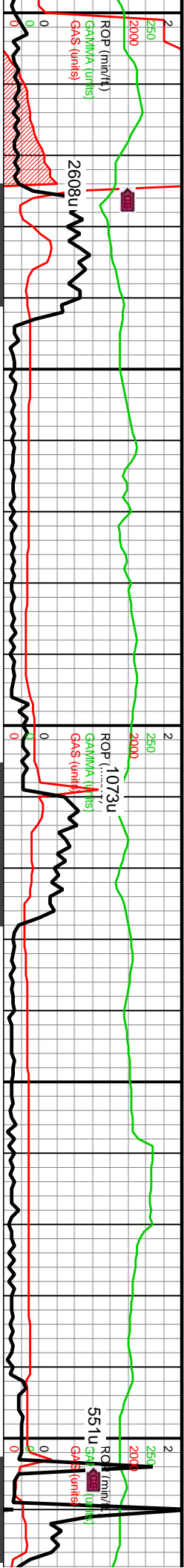
14180-14240 CHK (85%): pred gy, ip lt gy, offwht- bf- tn mot thru, frm- sl hd, sme sl frm, pred sb blk, pred sl- mod arg, occ mryl intbds thru, occ calc incl, rr pyr: MRLST (15%): dk gy, ip sl blk, sme bf- gy mot, pred hd, sb ply- fis, ip sb blk, sme bf- gy mot, pred hd, sb ply- fis, ip sb blk, arg thru, tr cal incl, rr bent

14240-14300 CHK (70%): pred gy, ip lt gy, offwht- bf- tn mot thru, frm- sl hd, sme sl frm, pred sb blk, pred sl- mod arg, occ mryl intbds thru, occ calc incl, rr pyr: MRLST (20%): dk gy, ip sl blk, sme bf- gy mot, pred hd, sb ply- fis, ip sb, blk, arg thru, tr cal incl, rr bent; SH (10%): med gy, blk- spl, v frm- hd, ip mryl- calc

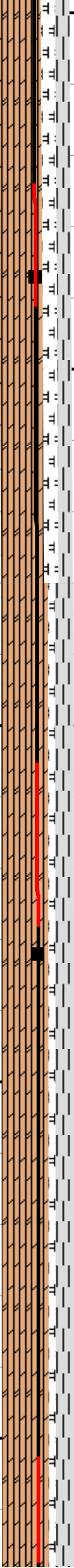
14300-14360 CHK (55%): pred gy, ip lt gy, offwht- bf- tn mot thru, frm- sl hd, sme sl frm, pred sb blk, pred sl- mod arg, occ mryl intbds thru, occ calc incl, rr pyr: MRLST (30%): dk gy, ip sl blk, sme bf- gy mot, pred hd, sb ply- fis, ip sb, blk, arg thru, tr cal incl, rr bent; SH (15%): med gy, blk- spl, v frm- hd, ip mryl- calc

14360-14420 CHK (55%)
lt- dk gy, offwht- bf- tn mot, sme sl frm, pred sb blk, 1 occ mryl intbds thru, occ c MRLST (30%): dk gy, ip s mot, pred hd, sb ply- fis, thru, tr cal incl, rr bent; Sh blk- spl, v frm- hd, ip mryl



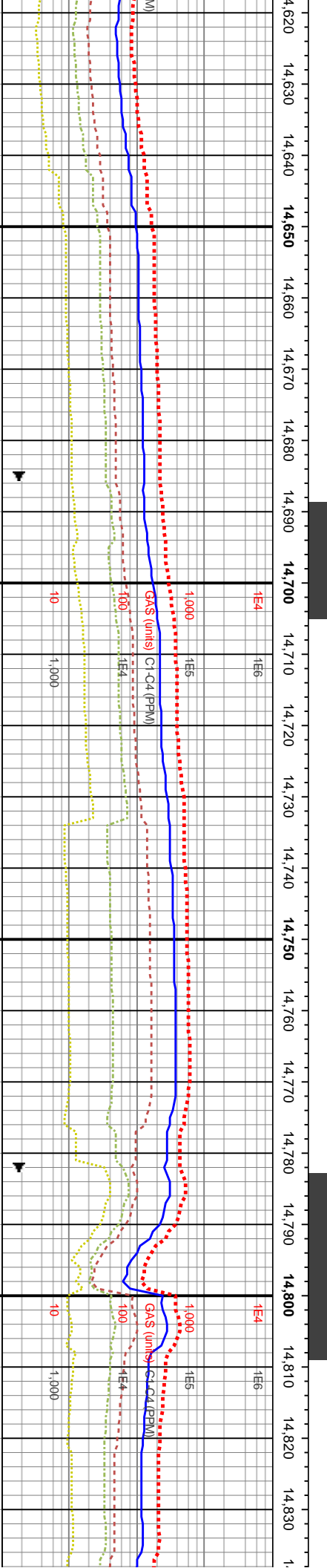


6500	MD: 14.437° Inclination: 94.37° Azimuth: 269.82° TVD: 6,854.28' VS: 7,038.29'	WOB: 39Klbs Rotary: 30RPM Strokes: 210SPM Pump Rate: 610GPM TVD: 6,849.6' VS: 7,133.16'	MD: 14.532° Inclination: 91.28° Azimuth: 269.22° TVD: 6,849.6' VS: 7,133.16'
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pred med gy, ip t thru, frm-si hd, pred sl- mod arg, calc incl, rr pyr, l blk, sme bf- gy ip sb, blk, arg t (15%): med gy, y- calc / cau	14420-14480 MRLST (60%): dk gy, ip sl blk, sme bf- gy mot, pred hd, sb pty- fis, ip sb blk, arg thru, tr cal incl- lse cal, rr pyr, SH (20%): dk gy- blk, sme gy- brn mot, blk, hd, sme sl calc, mrl; CHK (20%): pred med- dk gy, ip lt gy, offwh- bf- tn mot, frm- sl hd, sme sl frm, pred sb blk, pred mod arg, mrl intbds thru, occ calc incl	14480-14540 MRLST (75%): dk gy, ip sl blk, sme bf- gy mot, pred hd, sb pty- fis, ip sb blk, arg thru, tr cal incl- lse cal, rr pyr, sme bent, tr chky intbds, SH (25%): dk gy- blk, sme gy- brn mot, blk, hd, sme sl calc, mrl 7500	14540-14600 MRLST (70%): dk gy, ip sl blk, sme bf- gy mot, pred hd, sb pty- fis, ip sb blk, arg thru, tr cal incl- lse cal, rr pyr, sme bent, tr chky intbds, SH (30%): dk gy- blk, sme gy- brn mot, blk, hd, sme sl calc, mrl 7500	14600-14660 MRLST (70%): dk gy, ip sl blk, sme bf- gy mot, pred hd, sb pty- fis, ip sb blk, arg thru, tr cal incl- lse cal, rr pyr, sme bent, tr chky intbds, SH (30%): dk gy- blk, sme gy- brn mot, blk, hd, sme sl calc, mrl 7500
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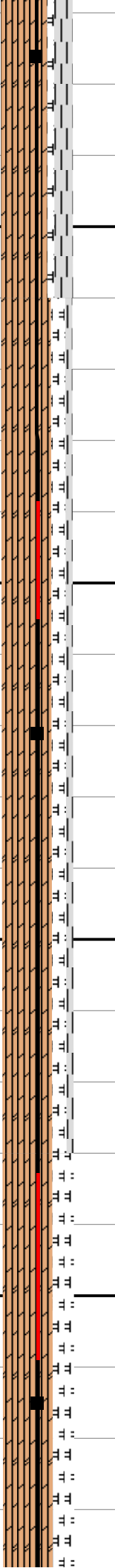




D : 14,626'
Inclination: 90.44°
Azimuth: 268.91°
TVD: 6,848.18'
S: 7,227.14'

6500
MD: 14,721'
Inclination: 91.14°
Azimuth: 268.49°
TVD: 6,846.87'
VS: 7,322.1'

6500
MD: 14,815'
Inclination: 90.57°
Azimuth: 269.16°
TVD: 6,845.47'
VS: 7,416.07'

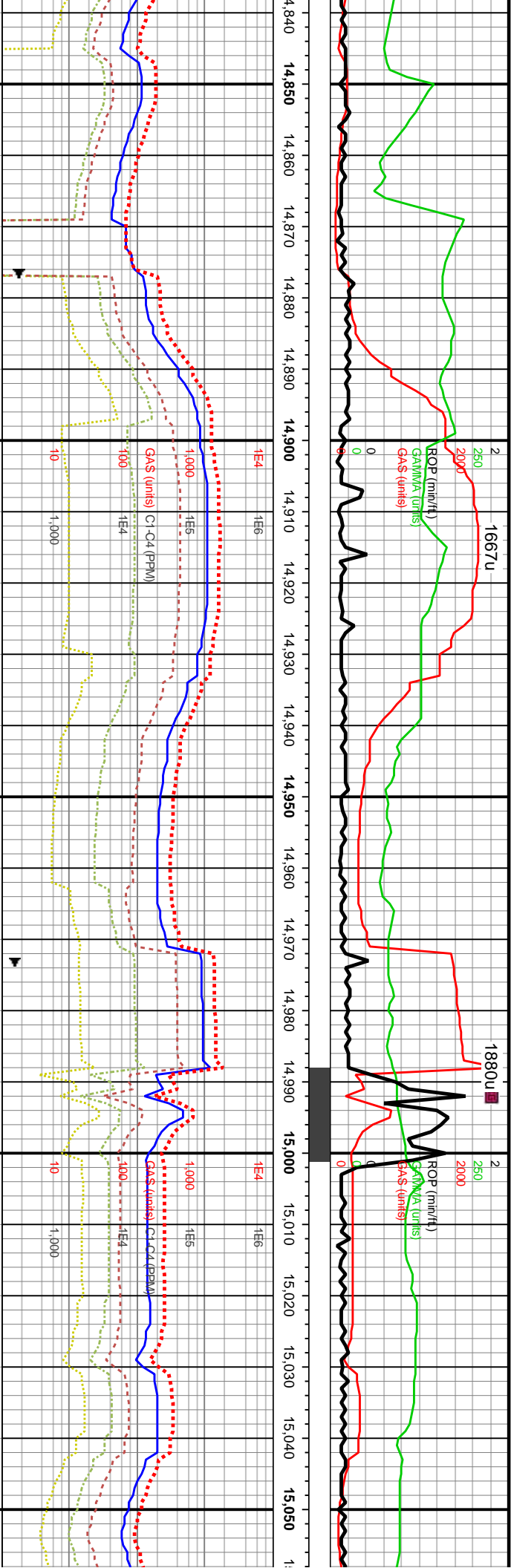


14660-14720 CHK (70%): pred gy, ip lt gy, offwht- bf- tn mot thru, frm- sl hd, sme sl frm, pred sb blk, pred sl- mod arg, occ mrlly intbds thru, occ calc incl, rr pyr; MRLST (20%): dk gy, ip sl blk, sme bf- gy mot, pred hd, sb ply- fls, ip sb, blk, arg thru, tr cal incl, rr bent; SH (10%): med gy, blk- spl, v frm- hd, ip mrl- calc

14720-14780 CHK (70%): pred gy, ip lt gy, offwht- bf- tn mot thru, frm- sl hd, sme sl frm, pred sb blk, pred sl- mod arg, occ mrlly intbds thru, occ calc incl, rr pyr; MRLST (20%): dk gy, ip sl blk, sme bf- gy mot, pred hd, sb ply- fls, ip sb, blk, arg thru, tr cal incl, rr bent; SH (10%): med gy, blk- spl, v frm- hd, ip mrl- calc

14780-14840 CHK (65%): pred med- gy, sme lt brn, offwht- bf- lt brn mot, frm- sl hd, sme sl frm, pred sb blk, pred mod arg, mrlly intbds thru, occ calc incl, rr pyr; MRLST (35%): dk gy, sl blk, sme bf- gy mot, pred hd, sb ply, ip sb blk, arg thru, sme cal incl, tr lse cal, tr bent





MD: 14,910'
Inclination: 91.01°
Azimuth: 268.81°
TVD: 6,844.16'
VS: 7,511.05'

MD: 15,004': 54Klbs
Inclination: 90.74° PM
Azimuth: 270.42° 16SPM
TVD: 6,842.73'ate: 599GPM
VS: 7,605.03'

TVD (ft)

TVD (ft)

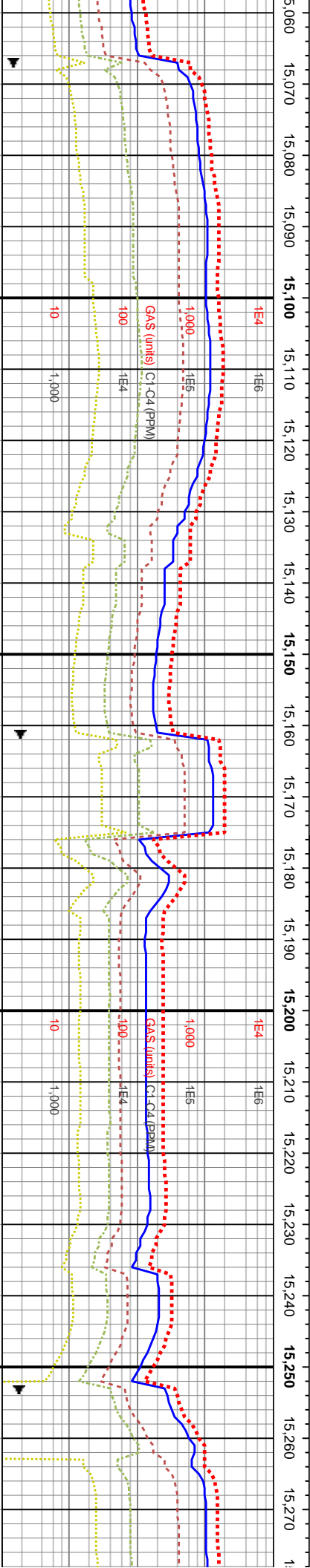
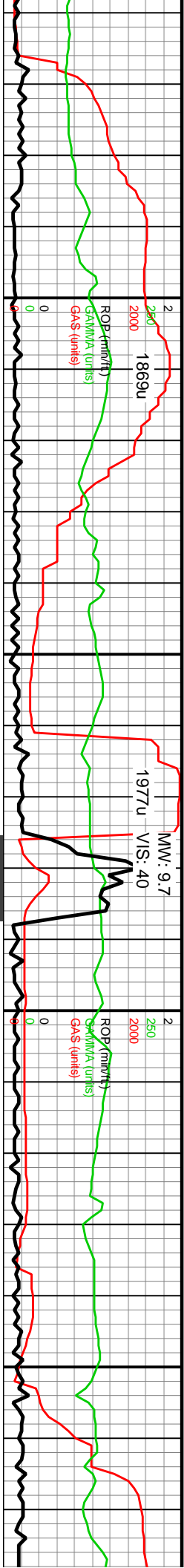
14840-14900 CHK (75%): pred med- gy, sme lt brn, offwht- bf- lt brn mot, frm- sl hd, sme sl frm, pred sb blk, pred mod arg, mrlly intbds thru, occ calc incl, tr pyr; MRLST (25%): dk gy- sl blk, sme bf- gy mot, pred hd, sb ply, ip sb blk, arg thru, sme cal incl, tr lse cal, tr bent

14900-14960 CHK (60%): pred med- gy, sme lt brn, offwht- bf- lt brn mot, frm- sl hd, sme sl frm, pred sb blk, pred mod arg, mrlly intbds thru, occ calc incl, tr bent; MRLST (20%): dk gy- sl blk, sme bf- gy mot, pred hd, sb ply, ip sb blk, arg thru, sme cal incl, tr lse cal, SH (20%): med gy, hd, blk

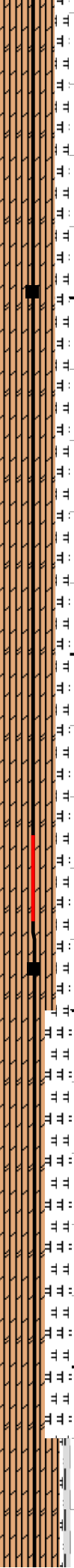
14960-15020 CHK (60%): pred med- gy, sme lt brn, offwht- bf- lt brn mot, frm- sl hd, sme sl frm, pred sb blk, pred mod arg, mrlly intbds thru, occ calc incl, tr bent; MRLST (20%): dk gy- sl blk, sme bf- gy mot, pred hd, sb ply, ip sb blk, arg thru, sme cal incl, tr lse cal, SH (20%): med gy, hd, blk

15020-15080 CHK (80%): brn, offwht- bf- lt brn mot, frm, pred sb blk, pred mod arg, mrlly intbds thru, occ calc incl; MRLST (20%): dk gy- sl blk, sme bf- gy mot, pred hd, sb ply, ip sb blk, arg thru, sme cal incl, tr lse cal, SH (20%): med gy, hd, blk





MD: 15,099.500
Inclination: 91.48°
Azimuth: 271.53°
TVD: 6,840.89'
VS: 7,700'



TVD (ft)

pred med gy, occ lt
brn, offwht- bf- lt brn mot, frm- sl hd, sme sl
frm, pred sb blk, pred mod arg, mrlly intbds
thru, occ calc incl, MRLST (20%): dk gy- sl blk,
sme bf- gy mot, pred hd, sb ply, ip sb blk,
arg thru, sme cal incl, tr lse cal

TVD (ft)

MD: 15,194'
Inclination: 89.97°
Azimuth: 270.96°
TVD: 6,839.68'
VS: 7,794.96'



TVD (ft)

15080-15140 CHK (80%): pred med gy, occ lt
brn, offwht- bf- lt brn mot, frm- sl hd, sme sl
frm, pred sb blk, pred mod arg, mrlly intbds
thru, occ calc incl, MRLST (20%): dk gy- sl blk,
sme bf- gy mot, pred hd, sb ply, ip sb blk,
arg thru, sme cal incl, tr lse cal

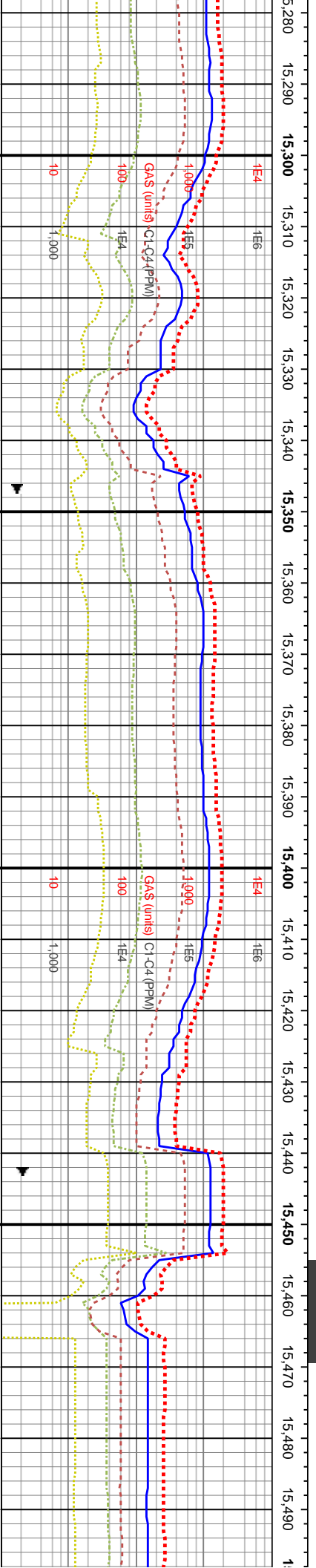
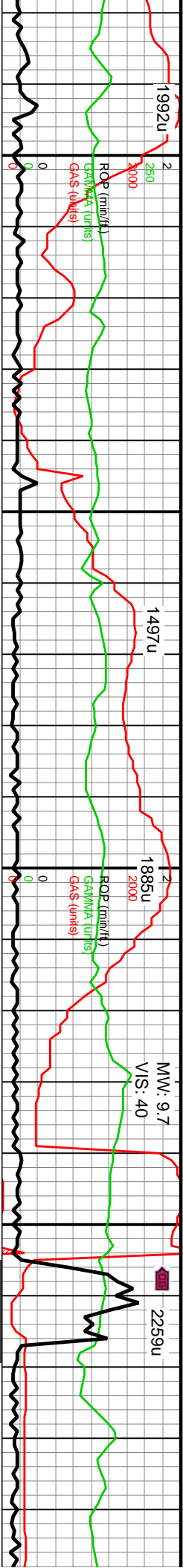
TVD (ft)

15200-15260 CHK (65%): pred med gy, occ lt
brn, offwht- bf- lt brn mot, frm- sl hd, sme sl
frm, pred sb blk, pred mod arg, mrlly intbds
thru, occ calc incl, tr bent; MRLST (35%): dk
gy- sl blk, sme bf- gy mot, pred hd, sb ply, ip
sb blk, arg thru, sme cal incl, tr lse cal

TVD (ft)

15260-
brn, offwht- bf- lt brn mot, frm- sl hd, sme sl
frm, pred sb blk, pred mod arg, mrlly intbds
thru, occ calc incl, tr bent; MRLST (35%): dk
gy- sl blk, sme bf- gy mot, pred hd, sb ply, ip
sb blk, arg thru, sme cal incl, tr lse cal

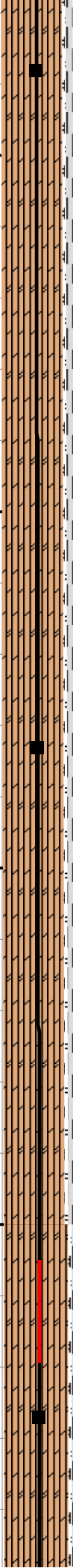
TVD (ft)



MD: 15,288'
Inclination: 91.18°
Azimuth: 272.05°
TVD: 6,838.74'
VS: 7,888.92'

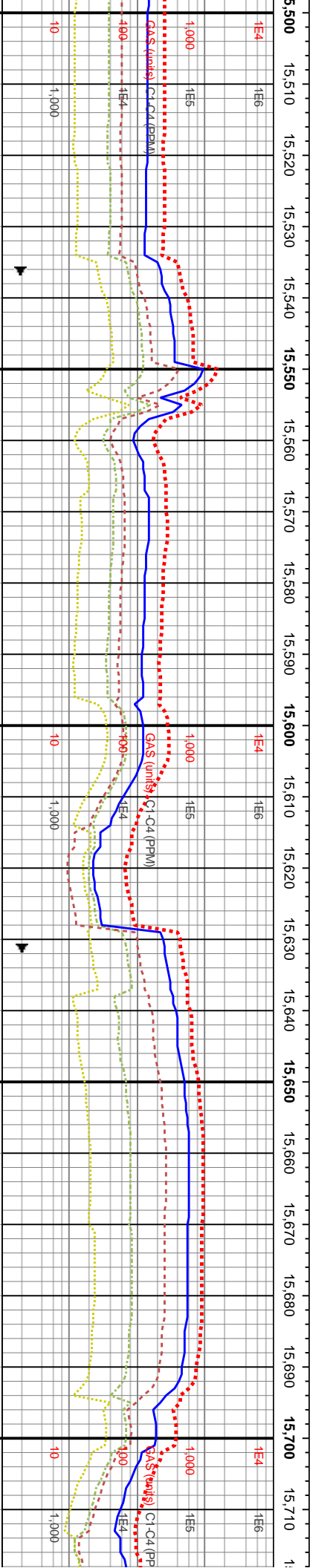
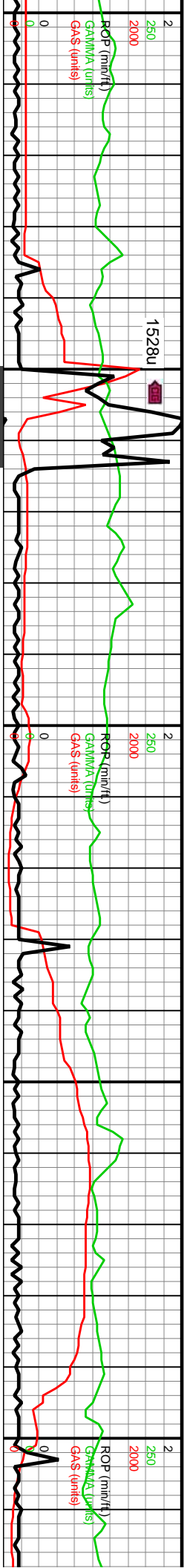
MD: 15,383'
Inclination: 92.28°
Azimuth: 272.69°
TVD: 6,835.87'
VS: 7,983.8'

MD: 15,477'
Inclination: 91.38°
Azimuth: 271.14°
TVD: 6,832.87'
VS: 8,077.69'

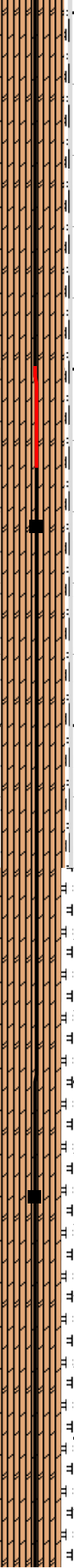


15320-15380 CHK (90%): pred med gy, occ lt brn, offwht- bf- lt brn mot, frm- sl hd, sme sl frm, pred sb blkly, pred mod arg, mrlly intbds thru, occ calc incl, rr bent, sme mrlly intbds; SH (10%): med gy, hd, blkly- spilt	15380-15440 CHK (90%): pred med gy, occ lt brn, offwht- bf- lt brn mot, frm- sl hd, sme sl frm, pred sb blkly, pred mod arg, mrlly intbds thru, occ calc incl, rr bent, sme mrlly intbds; SH (10%): med gy, hd, blkly- spilt	15440-15500 CHK: pred med- lt gy, occ lt br offwht- bf- lt brn mot, frm- sl frm, sme sl hd, pred sb blkly, pred sl- mod arg, occ calc incl, pyr, sme mrlly intbds, sme sh strg
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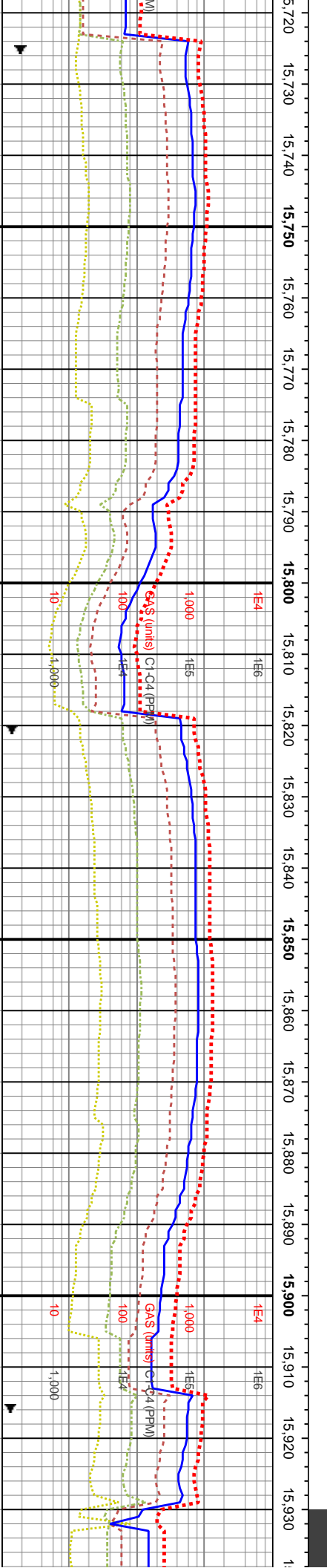
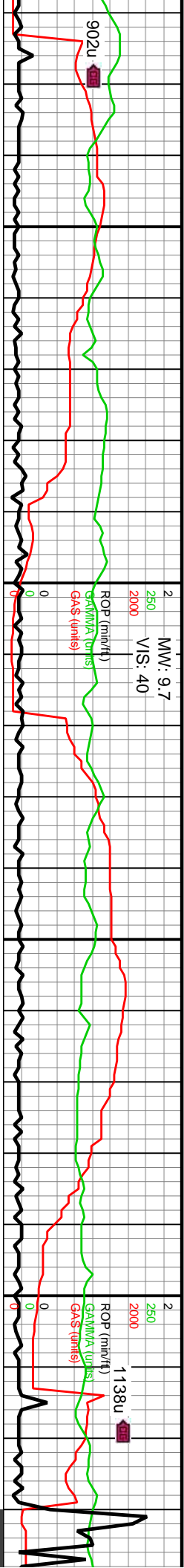
6WOB: 43Klbs Rotary: 65RPM Strokes: 202SPM Pump Rate: 587GPM		MD: 15,572' Inclination: 89.87° Azimuth: 268.84° TVD: 6,831.83' VS: 8,172.68'	
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TVD (ft)		TVD (ft)	
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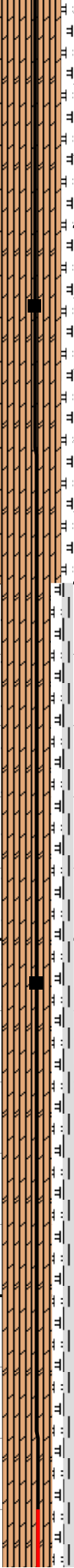
15500-15560 CHK: pred med- lt gy, occ lt brn, offwht- bf- lt brn mot, frm- sl frm, sme sl hd, pred sb blkly, pred sl- mod arg, occ calc incl, rr pyr, sme mrly intbds, sme sh strg		15560-15620 CHK: pred med- lt gy, occ lt brn, offwht- bf- lt brn mot, frm- sl frm, sme sl hd, pred sb blkly, pred sl- mod arg, occ calc incl, rr pyr, sme mrly intbds, sme med gy- dk, gy sh strg		15620-15680 CHK: lt gy- gy, occ dk gy wi f- u f elong chky incl & thn chky lamn, rr mrly incl, l- mod fls rd- sb ang- sb blkly ctgs, sm- chky tex, tr vf pyr, med calc wi cin HCL rxn, wi incr mrly incl gridg to MRLST (15%): gy- dk gy mot wi u f rd mrly incl, rr vf pyr & pyr stg, mod calc wi brn mrly resdl		15680-15740 CHK: lt gy- gy- dk gy if ang- sb blkly ctgs, v ang LS wi f- u f e chky lamn, rr brn mrly incl, sm- chky calc wi cin HCL rxn, wi incr mrly inc (15%): gy- dk gy mot wi u f rd mrly ir strg, mod calc wi brn mrly resdl	
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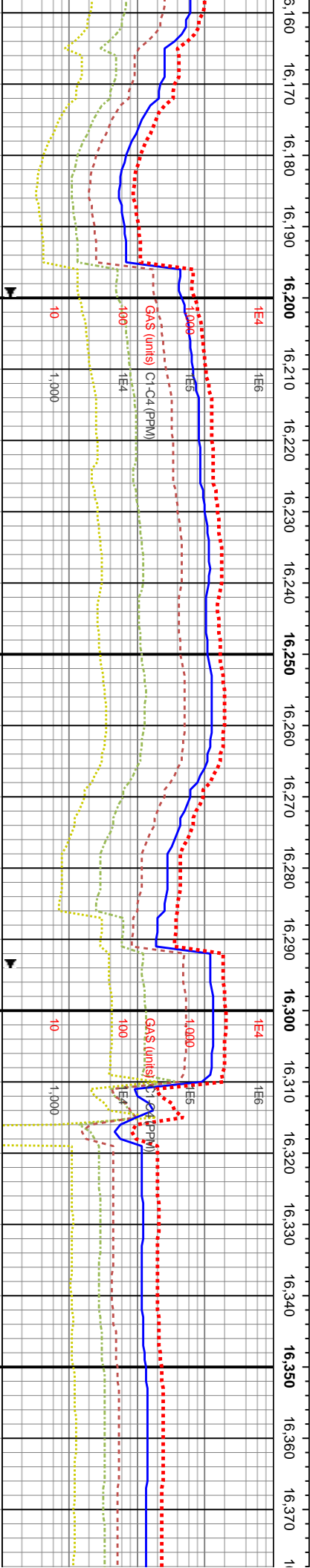
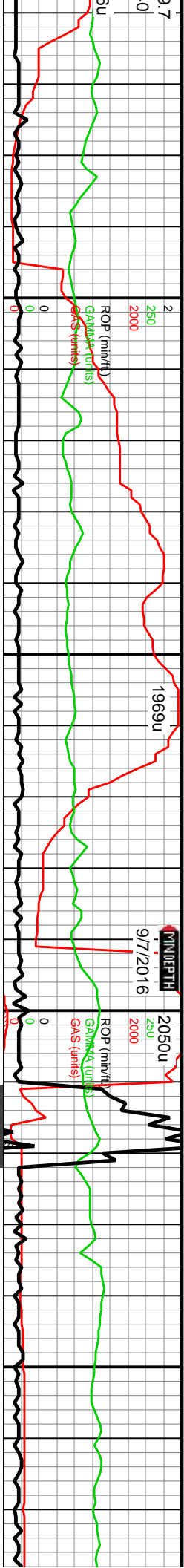
MD: 15,761'
Inclination: 90.07°
Azimuth: 269.99°
TVD: 6,832.27'
VS: 8,358.53'

MD: 15,856'
Inclination: 91.17°
Azimuth: 271.62°
TVD: 6,831.24'
VS: 8,453.51'



15740-15800 CHK: lt gy-gy, occ dk gy wi f-u f elong chky incl & thn chky lamm, rr mly incl, l-mod fis rd-sb ang-sb blk cygs, sm-chky tex, tr vf pyr, med calc wi cin HCL rxn, wi incr mly incl grdg to MRLST (15%): gy-dk gy mot wi u f rd mly incl, rr vf pyr & pyr strg, mod calc wi brn mly resdl	15800-15920 CHK (70%): lt gy-gy-dk gy ip, l-mod fis rd-sb ang-sb blk cygs, v arg LS wi f-u f elong chky incl & thn chky lamm, rr brn mly incl, sm-chky tex, tr vf pyr, med calc wi cin HCL rxn, wi incr mly incl grdg to MRLST (15%): gy-dk gy mot wi u f rd mly incl, rr vf pyr & pyr strg, mod calc wi brn mly resdl, SH (15%): v dk gy, frm-brit hi fis blk-ply cygs, sm tex, slic vn ip, non calc	15920-16040 C rd-sb ang-sb b (15%): gy-dk g frm-brit hi fis bl
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6500

MD: 16,234'
Inclination: 91.34°
Azimuth: 270.86°
TVD: 6,825.42'
VS: 8,831.36'

6500

MD: 16,328'
Inclination: 91.28°
Azimuth: 271.29°
TVD: 6,823.28'
VS: 8,925.33'

TVD (ft)

TVD (ft)

l-mod fis rd-sb ang-sb blkly ctgs, v arg LS wi f-u f
chky tex, tr vf pyr, med calc wi cin HCL rxn, SH
slic vn ip, non calc, MRLST (10%): gy-dk gy frm-brit
ang, mod calc wi brn mrly rescl

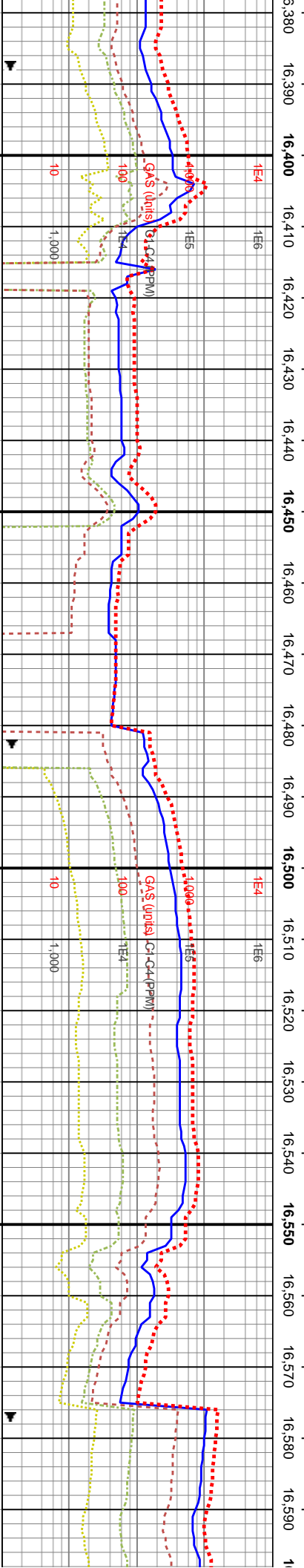
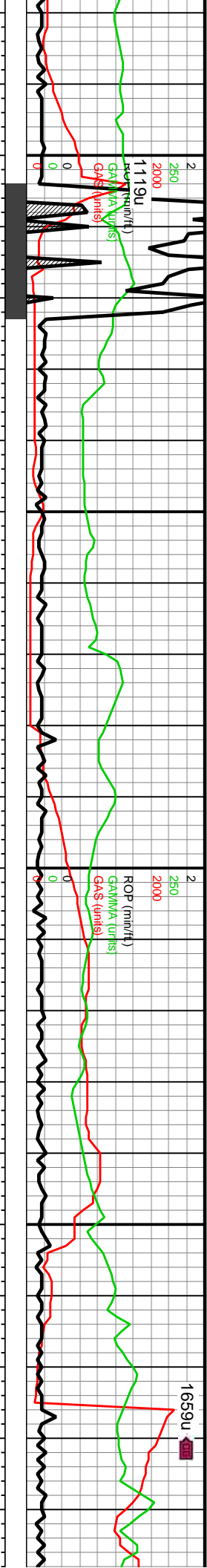
16220-16280 CHK (80%): lt gy-gy-dk gy ip, l-mod fis
rd-sb ang-sb blkly ctgs, v arg LS wi f-u f along chky incl
& thn chky lamn, rr brn mrly incl, sm-chky tex, tr vf pyr,
med calc wi cin HCL rxn, SH (15%): v dk gy, frm-brit hi
fis blkly-ply ctgs, sm tex, slic vn ip, non calc, wi rr
MRLST: gy-dk gy frm-brit mod fis sb ang-blkly ctgs, sm
tex, rr vf pyr & c pyr stg, mod calc wi brn mrly rescl

16280-16400 CHK (75%): pred lt gy-gy, occ dk gy, l-mod fis rd-sb ang-sb blkly ctgs, v arg l
chky incl & thn chky lamn, rr brn mrly incl, sm-chky tex, tr vf pyr, med calc wi cin HCL rxn,
gy, frm-brit hi fis blkly-ply ctgs, sm tex, slic vn ip, non calc, MRLST (10%): gy-dk gy frm-brit
ang-blkly ctgs, sm tex, rr vf pyr & c pyr stg, mod calc wi brn mrly rescl

7500

7500





MD: 16,423'
Inclination: 89.56°
Azimuth: 268.05°
TVD: 6,822.58'
VS: 9,020.3'

WOB: 34Klbs
Rotary: 66RPM
Strokes: 198SPM
Pump Rate: 575GPM
MD: 16,517'
Inclination: 89.23°
Azimuth: 268°
TVD: 6,823.57'
VS: 9,114.23'

TVD (ft)

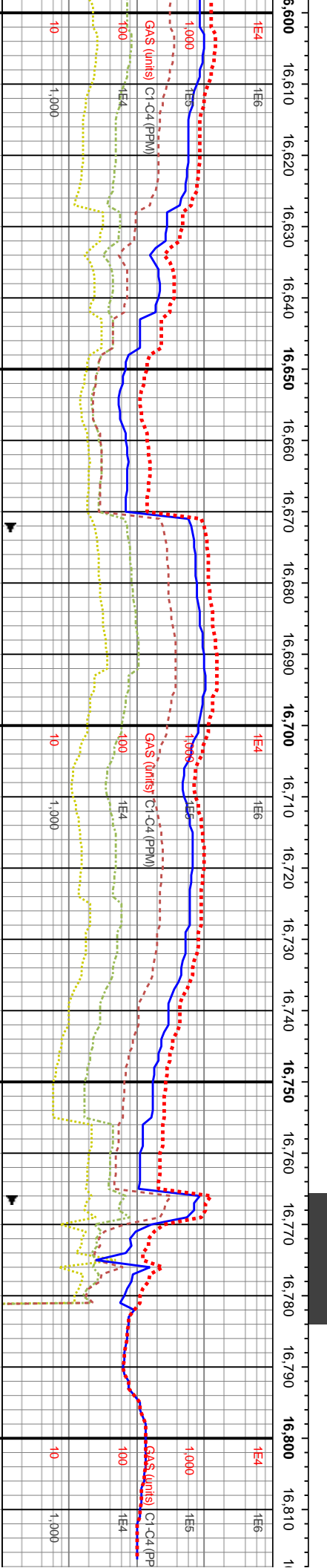
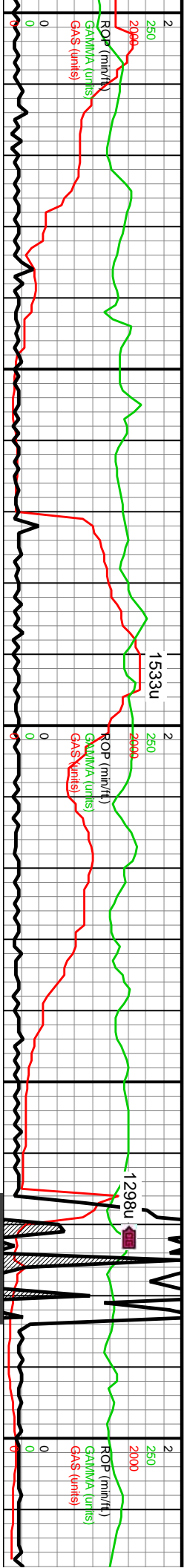
TVD (ft)

S wi f-u f elong SH (15%): v dk
16400-16520 CHK (85%): lt gy-gy, occ dk gy wi f-u f elong chky incl & thn chky lamn, rr mly incl, l-mod fis
rd-sb ang-sb blk cy ctgs, sm-chky tex, tr vf pyr, med calc wi cin HCL rxn, wi incr mly incl grdg to MRLST (10%):
gy-dk gy mot wi u f rd mly incl, rr vf pyr & pyr strg, mod calc wi brn mly resdl, wi rr SH (5%): v dk gy, frm-brit hi
fis blk-ply ctgs, sm tex, silc vn ip, non calc

16520-16580 CHK (85%): lt gy-gy, occ dk gy wi f-u f
elong chky incl & thn chky lamn, rr mly incl, l-mod
fis rd-sb ang-sb blk cy ctgs, sm-chky tex, tr vf pyr, med
calc wi cin HCL rxn, wi incr mly incl grdg to MRLST
(15%): gy-dk gy mot wi u f rd mly incl, rr vf pyr & pyr
strg, mod calc wi brn mly resdl

16580-16700
strg, mod cal
mly incl, l-m
dk gy, frm-br

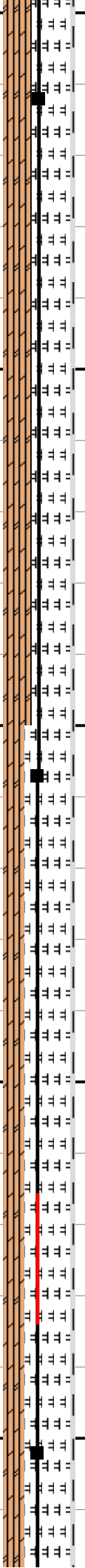




MD: 16,612'
Inclination: 88.96°
Azimuth: 267.94°
TVD: 6,825.07'
VS: 9,209.15'

MD: 16,707'
Inclination: 88.79°
Azimuth: 268.47°
TVD: 6,826.94'
VS: 9,304.08'

MD: 16,802'
Inclination: 90.77°
Azimuth: 268.44°
TVD: 6,827.3'
VS: 9,399.03'



TVD (ft)

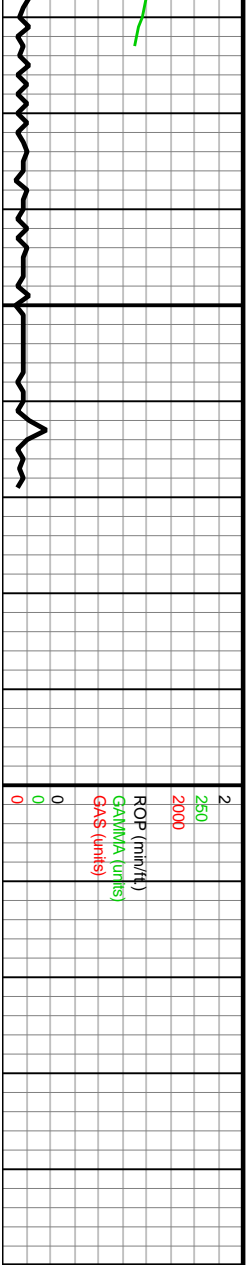
TVD (ft)

TVD (ft)

MRLST (55%): gy-dk gy, frm-brit mod fis sb blkly ctgs, mot wi u f rd mrlly incl, r v f pyr & pyr c wi brn mrlly resd, CHK (40%): lt gy-gy, occ dk gy wi f-u f elong chky incl & thn chky lamn, r mod fis rd-sb ang-sb blkly ctgs, sm-chky tex, tr v f pyr, med calc wi cin HCL rxn, wi rr SH (5%): v t hi fis blkly-pty ctgs, sm tex, silc vn ip, non calc

16700-16820 MRLST (65%): gy-dk gy mot wi u f rdd brn mrlly incl ip, frm-brit mod fis sb blkly ctgs, r v f pyr & pyr strg, mod calc wi brn mrlly resd, CHK (30%): lt gy-gy, occ dk gy, l-mod fis rd-sb ang-sb blkly ctgs, v ang LS wi f-u f elong chky incl & thn chky lamn, r mrlly incl, sm-chky tex, tr v f pyr, med calc wi cin HCL rxn, wi rr SH (5%): v dk gy, frm-brit hi fis blkly-pty ctgs, sm tex, silc vn ip, non calc





16,820	16,830	16,840	16,850	16,860	16,870	16,880	16,890	16,900	16,910	16,920	16,930	16,940	16,950
									1E4	1E6			
									Bit #: 2	1E6			
									Type: SK516-K2-Z				
									Size: 7 7/8	-Q4 (PPM)			
									Depth In: 1,557'				
									Depth Out: 16,870'				
									Hours: 40.9 hrs				
									Avg Ft/Hr: 374.4 '/hr				
									Jets: 7*12				
									S/N: A229405				
									6500				
									MD: 16,870'				
									Inclination: 90.77°				
									Azimuth: 268.44°				
									TVD: 6,826.32'				
									Projected				
									TD Reached 9-7-16				
									TVD (ft)				
									7500				
16820-16870 MRLST (65%): gy-dk gy, frm-brit mod fis sb blkly ctgs, mot wi u f rd mrlly incl, rr vf pyr & pyr strg, mod calc wi brn mrlly resdl, CHK (30%): lt gy-gy, occ dk gy wi f-u f elong chky incl & thn chky lamn, rr mrlly incl, l-mod fis rd-sb ang-sb blkly ctgs, sm-chky tex, tr vf pyr, med calc wi cln HCL rxn, wi rr SH (5%): v dk gy, frm-brit hi fis blkly-pty ctgs, sm tex, silc vn ip, non calc													

