



Empirica

Scale: 5" / 100'
Measured Depth Log

Well Name Winder South 3

Location Sec. 9-T6N-R67W

State Colorado

Country USA

County Weld

Rig Number Patterson 346

API Number 05-123-43408-00

Field Wattenberg

Geographic Region DJ Basin

Drilling Completed 9/2/2016

Spud Date 8/29/2016

Surface Coordinates SHL: 2306'FNL, 488' FEL, Sec. 9

Lat: 40° 30' 9.6258"

Long: -104° 53' 26.2566"

Bottom Hole Coordinates BHL: 2365'FFSLL, 460' FFWLL, Sec. 8 T6N R67W

Ground Elevation 4,854'

K.B. Elevation 4,878.5'

Logged Interval 6,440' To 16,968'

Total Depth 16,968'

Formation Niobrara B 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: 8-29-16
TD: 9-2-16

Services Provided 2-man Logging
On Site Geosteering

Logger Names Dominic Pitre/ Nicholas V

Address ALS Empirica
6510 Guhn Road
Houston, Texas 77040

Zone Color Coding

Oil

Note

Error

Condensate

Core

Water

Gas

Pressure

Seal

Rock Types

UNKNOWN

ANHYDRITE

GYPSUM

SALT

CHALK

LIMESTONE

DOLOMITE

CHERT

COAL

MARLSTONE

CLAYSTONE

SHALE

SHALE GRAY

SHALE COLORED

SILTSTONE

SANDSTONE

CONGLOMERATE

BRECCIA

TILL

BENTONITE

TUFF

IGNEOUS

METAMORPHIC

CEMENT

Accessories

Fossils

F FOSSIL

GASTROPOD

ALGAE

AMPHIPORA

BELEMNITE

BIOCLASTIC

BRACHIOPOD

BRYOZOA

CEPHALOPOD

CORAL

CRINOID

ECHINOID

FISH

FORAMINIFERA

ARGILLACEOUS

ARGILLITE GRAIN

BENTONITE

BITUMENOUS SUBSTANCE

BRECCIA FRAGMENTS

CALCAREOUS

CARBONACEOUS FLAKES

PLANT REMAINS

PELLET

PISOLUTE

PLANT SPORES

SCAPHOPOD

STROMATOPOROID

GLAUCONITE

GYPSIFEROUS

HEAVY MINERAL

KAOLIN

MARLSTONE

MINERAL CRYSTALS

NODULES

PHOSPHATE PELLET

PYRITE

SALT CAST

SANDY

DOLOMITIC

FELDSPAR

FERRUGINOUS PELLET

FERRUGINOUS

Stringer

ANHYDRITE STRINGER

BENTONITE STRINGER

COAL STRINGER

DOLOMITE STRINGER

GYPSUM STRINGER

LIMESTONE STRINGER

MARLSTONE (CALC) STRG

MARLSTONE (DOL) STRG

SANDSTONE STRINGER

SHALE STRINGER

SILTSTONE STRINGER

Other Syn

ORGANIC

PINPOINT

DEAD

EVEN

QUESTIONABLE

SPOTTED STAINING

FORM

GAS SHOW

VUGGY

NORMAL F

OIL SHOW

OVERTURN

Engineering

BIT

CASING

REVERSE

OVERTURN

CONNECTION (LEFT)

CONNECTION (RIGHT)

Porosity

E EARTHY

F FENESTRAL

F FRACTURE

X INTERCRYSTALLINE

I INTEROOLITIC

M MOLDIC

SLIDE

SURVEY

TRIP GAS

WIRELINE

FAULT

WIRELINE

SIDEWALL

CONNECTION GAS

CORE - LOST

CORE - RECOVERED

DST INTERVAL

WIRELINE

mbols

ATION TOP L LITHOGRAPHIC

Rounding

MX MICROXLN

A ANGULAR **MS** MUDSTONE

R ROUNDED **PS** PACKSTONE

S SUBANG **WS** WAKESTONE

F SUBRND

Sorting

Textures

M MODERATE

B BOUNDSTONE **P** POOR

C CHALKY **W** WELL

CX CRYPTOXLN

E EARTHY

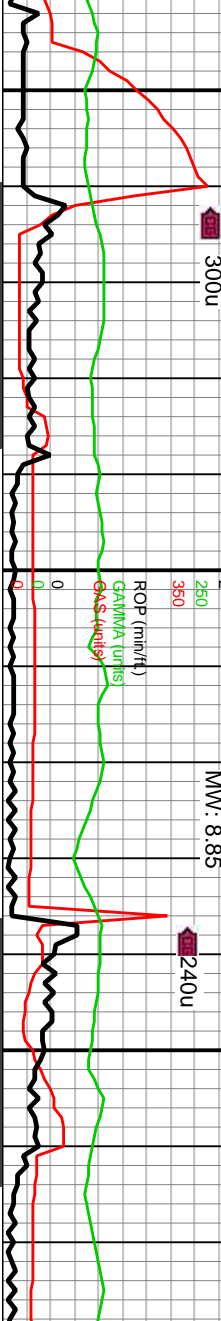
FX FINELYXLN

GS GRAINSTONE

ROP
GAMMA
GAS

Extraction OG
Welder County, Colorado
Spud Date: 8-29-16
Surface Casing @ 1,552'
2-man logging / Geosteering Began: 8-29-16

Linear Scale



Slide/Rotate

Depth Labels

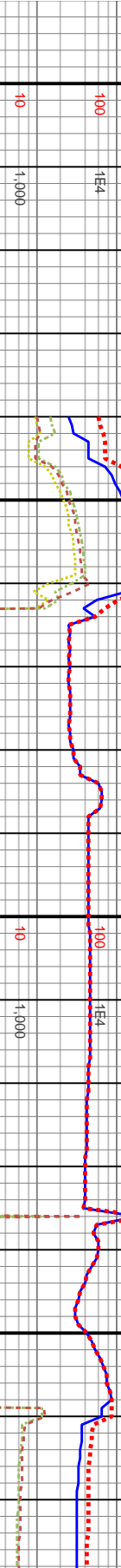


100 units = 1% Methane
10000 units = 100% Methane

Total Gas & Chromatograph

GAS
C1
C2
C3
C4

All Depths Correspond to Driller's Pipe Tally



Logarithmic Scale



MD: 6,476'
Inclination: 9.95°
Azimuth: 149.07°
TVD: 6,406.34'
VS: -461.71'

WOB: 29Klbs
Rotary: 50RPM
Strokes: 220SPM
Pump Rate: 640GPM

MD: 6,570'
Inclination: 11.28°
Azimuth: 149.2°
TVD: 6,498.73'
VS: -470.63'

Well Bore
TVD



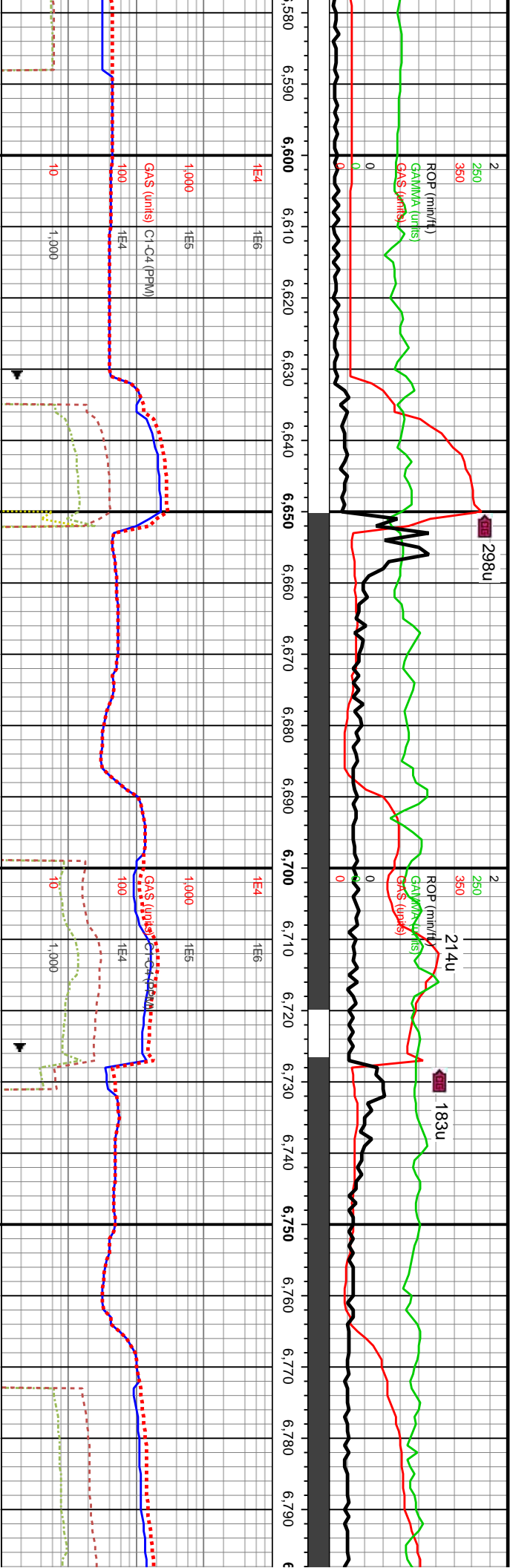
6440-6500 SS (75%): pred medgy- gy- lt brn sd grs. bf- offwht- ltgy sil cnt mtz, mod dk gy arg cnt, mod- v trnsd sd grs, pred fri- frm grn sup clus, ip frm- fri mtz sup clus, pred vf grd sd, intbdd silt- sh, SLTY SH (25%): crm- tn- med gy, sme med gy, sme lt brn- bf str, sb blk- sb ply, sl frm- sl sft, vf sd- slty intbds

6500-6560 SS (50%): pred medgy- brn sd grs, pred dk gy arg cnt, mod bf- offwht- ltgy sil cnt mtz, mod- sl trnsd sd grs, pred fri- frm grn sup clus, ip frm- fri mtz sup clus, pred vf grd sd, intbdd silt- sh, SLTST (25%): medgy, brn mot, frm- sl hcd, sb blk- arg, v f grd sd intbds, SLTY SH (25%): crm- tn- med gy, ip sl blk, sme lt brn- blk mot, sb blk- sb ply, sl sft, slty intbds

6560-6620 SS
pred dk gy arg
mtz, mod- sl tr
clus, ip frm- fri
silt- sh, SLTY S
sme lt brn- blk
intbds SLTST
sb blk- arg, v

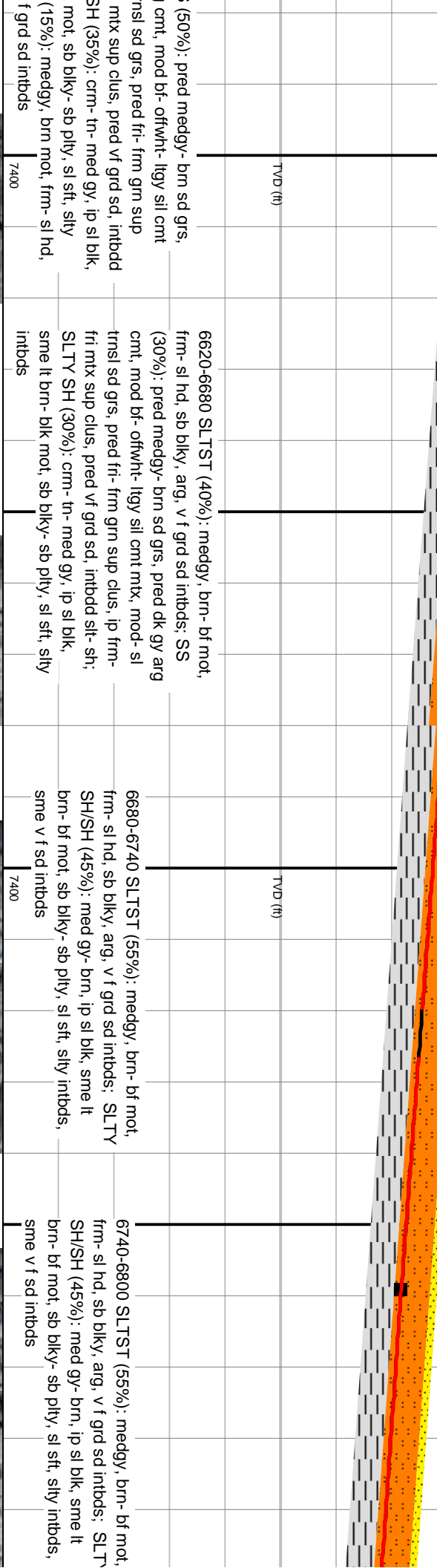
Images

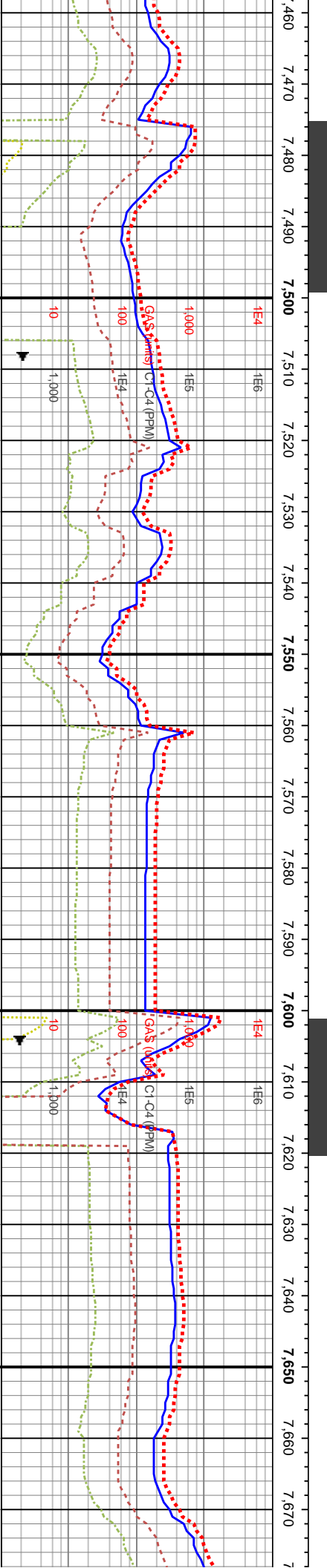
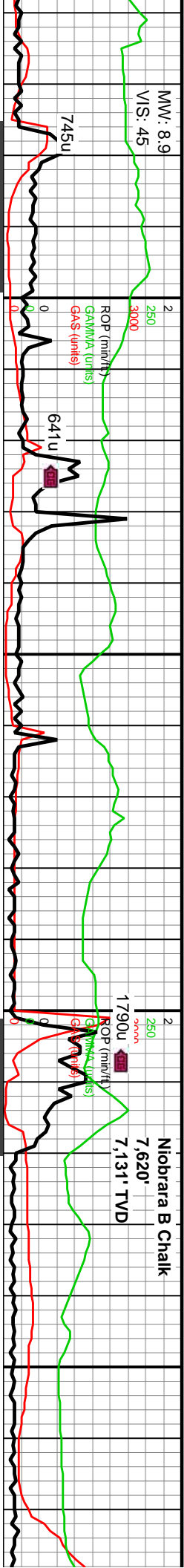


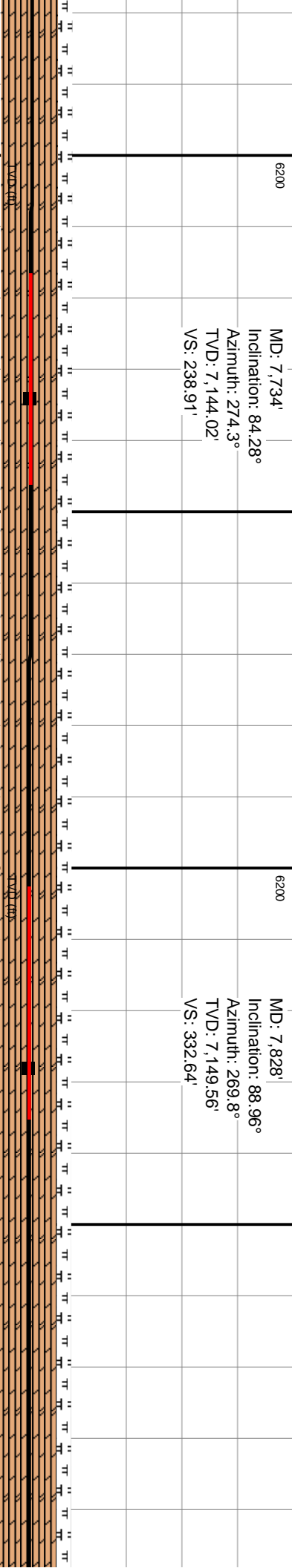
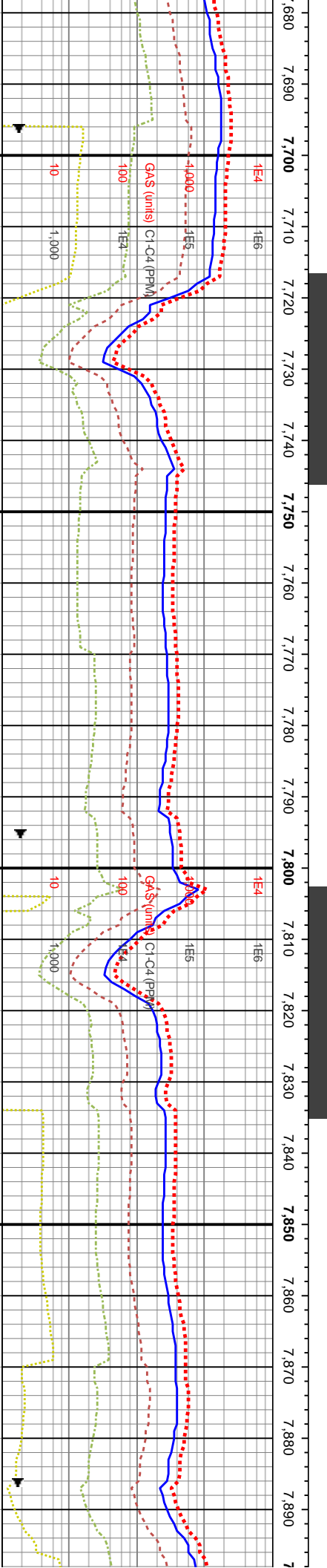
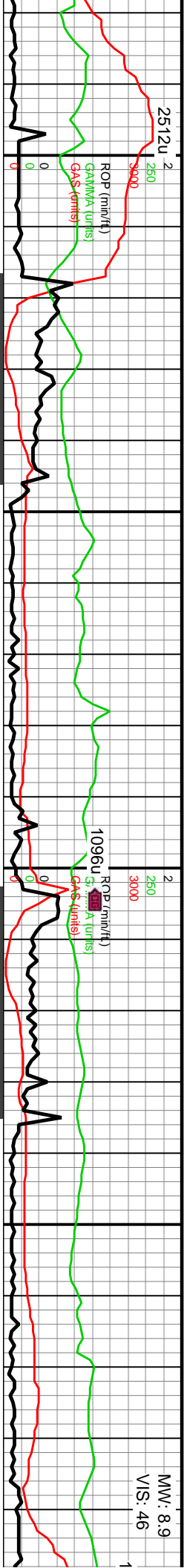


MD: 6,665'
Inclination: 9.84°
Azimuth: 159.47°
TVD: 6,592.12'
VS: -478.28'

MD: 6,759'
Inclination: 21.24°
Azimuth: 187.74°
TVD: 6,682.65'
VS: -478.87'

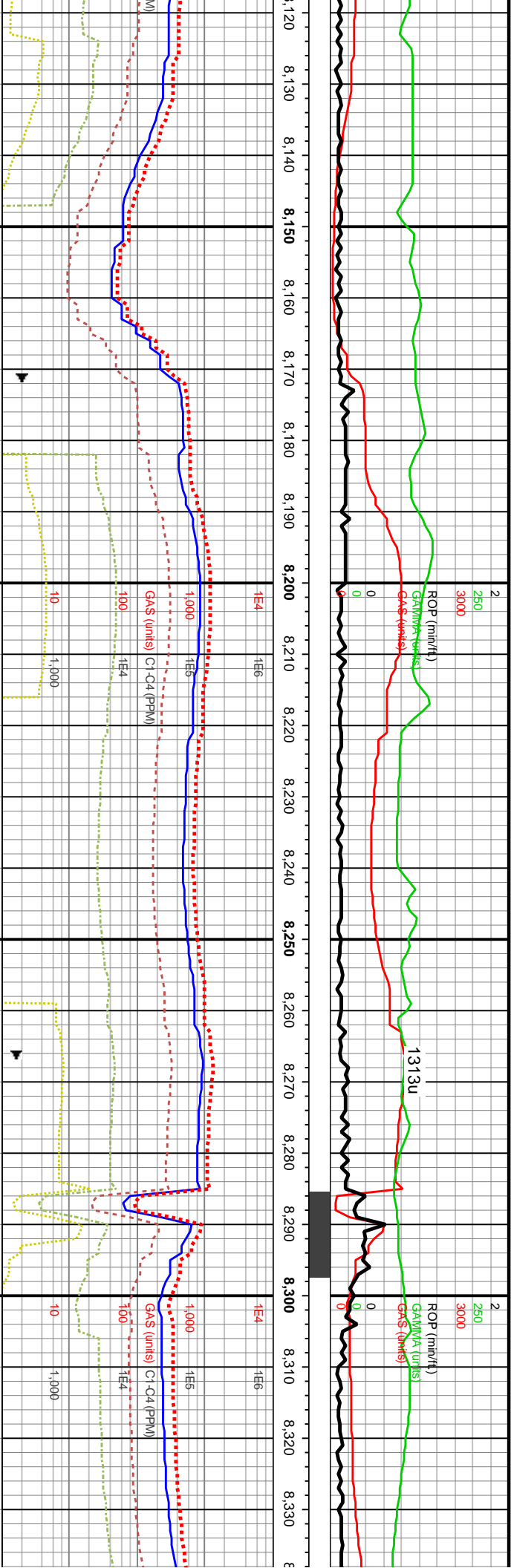






med med gy- gy, occ blk, offwhit- bf- med l, sme sl sft, pred mod arg, occ mrlly incl, sme pyr; sme sl blk, gy mot, arg, sme frac fl cal,	7700-7760 CHK (80%): pred med gy- gy, occ lt brn- dk gy, tr v dk gy- sl blk, offwhit- bf- med gy mot thru, pred frm- sl hd, sme sl sft, pred sb blk- blk, tr spl, ip sl- mod arg, occ mrlly intbds, mod lse cal, occ calc incl, sme pyr; MRLST (20%): dk- med gy, sme sl blk, gy mot, sb blk, sl frm- frm, mod- v arg, sme frac fl cal, intbds w chk	7760-7820 CHK (80%): pred med gy- gy, occ lt brn- dk gy, tr v dk gy- sl blk, offwhit- bf- med gy mot thru, pred frm- sl hd, sme sl sft, pred sb blk- blk, tr spl, ip sl- mod arg, occ mrlly intbds, mod lse cal, occ calc incl, sme pyr; MRLST (20%): dk- med gy, sme sl blk, gy mot, sb blk, sl frm- frm, mod- v arg, sme frac fl cal, intbds w chk	7820-7880 CHK (80%): pred med gy- gy, occ lt brn- dk gy, tr v dk gy- sl blk, offwhit- bf- med gy mot thru, pred frm- sl hd, sme sl sft, pred sb blk- blk, tr spl, ip sl- mod arg, occ mrlly intbds, mod lse cal, occ calc incl, sme pyr; MRLST (20%): dk- med gy, sme sl blk, gy mot, sb blk, sl frm- frm, mod- v arg, sme frac fl cal, intbds w chk, tr euhed cal	7880-7940 C dk gy, tr v dk pred frm- sl r spl, ip sl- mc occ calc incl, sme sl blk, gy sme frac fl cc
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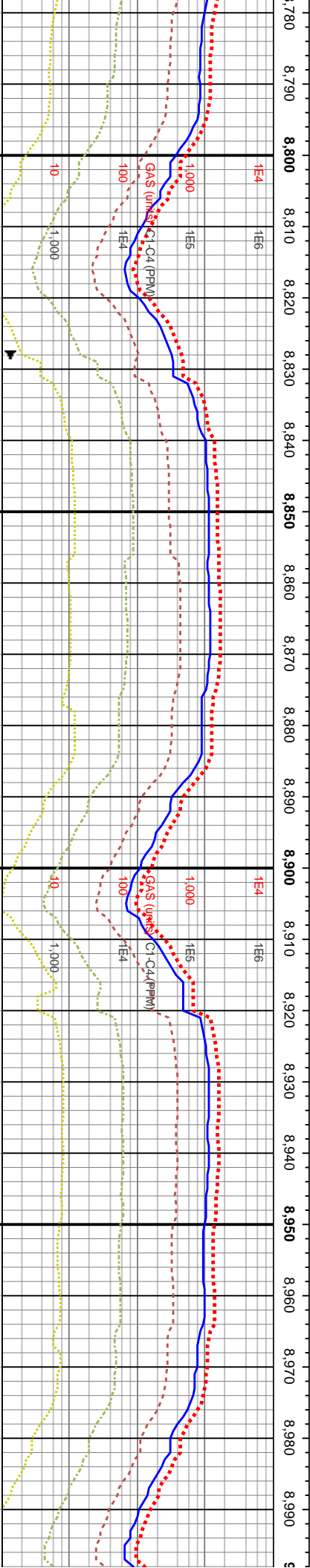
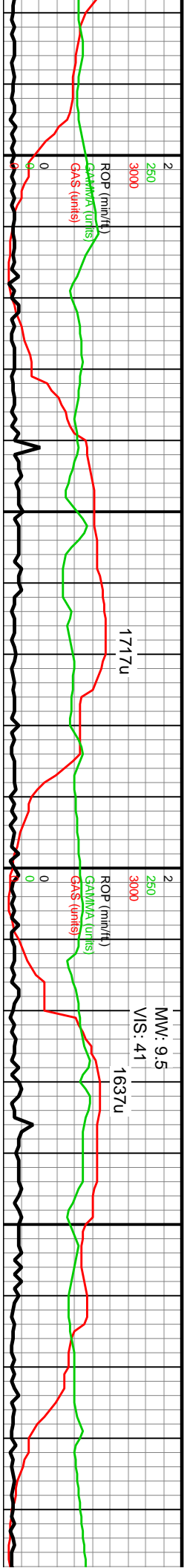


MD: 8,207'
Inclination: 91.51°
Azimuth: 268.39°
TVD: 7,142.68'
VS: 711.44'

MD: 8,301'
Inclination: 91.51°
Azimuth: 268.97°
TVD: 7,140.2'
VS: 805.38'

8120-8180 CHK (80%): pred med- dk gy, occ lt brn- sl blk, bf- med gy mot thru, pred frm- sl hd, pred sb blk- blk, tr spl, ip sl- mod arg, occ mrlly intbds, mod lse cal, calc incl, sme pyr, sme frac fl cal- euhed cal; MRLST (20%): dk- med gy, sme sl blk, gy mot, sb blk, sl frm- frm, mod- v arg, cal incl, intbds w chk	8180-8240 CHK (80%): pred med- dk gy, occ lt brn- sl blk, bf- med gy mot thru, pred frm- sl hd, pred sb blk- blk, tr spl, ip sl- mod arg, occ mrlly intbds, mod lse cal, calc incl, sme pyr, sme frac fl cal- euhed cal; MRLST (20%): dk- med gy, sme sl blk, gy mot, sb blk, sl frm- frm, mod- v arg, cal incl, intbds w chk	8240-8300 CHK (80%): pred med- dk gy, occ lt brn- sl blk, bf- med gy mot thru, pred frm- sl hd, pred sb blk- blk, tr spl, ip sl- mod arg, occ mrlly intbds, mod lse cal, calc incl, sme pyr, sme frac fl cal- euhed cal; MRLST (20%): dk- med gy, sme sl blk, gy mot, sb blk, sl frm- frm, mod- v arg, cal incl, intbds w chk	8300-8360 CHK (80%): pre lt brn- sl blk, bf- med gy mo hd, pred sb blk- blk, tr spl occ mrlly intbds, mod lse ca pyr, sme frac fl cal- euhed c dk- med gy, sme sl blk, gy r frm, mod- v arg, cal incl, inth
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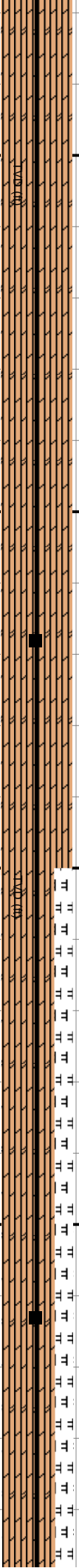




6200

9.26°
.38°

MD: 8,868'
Inclination: 90.17°
Azimuth: 269.98°
TVD: 7,142.48'
VS: 1,372.3

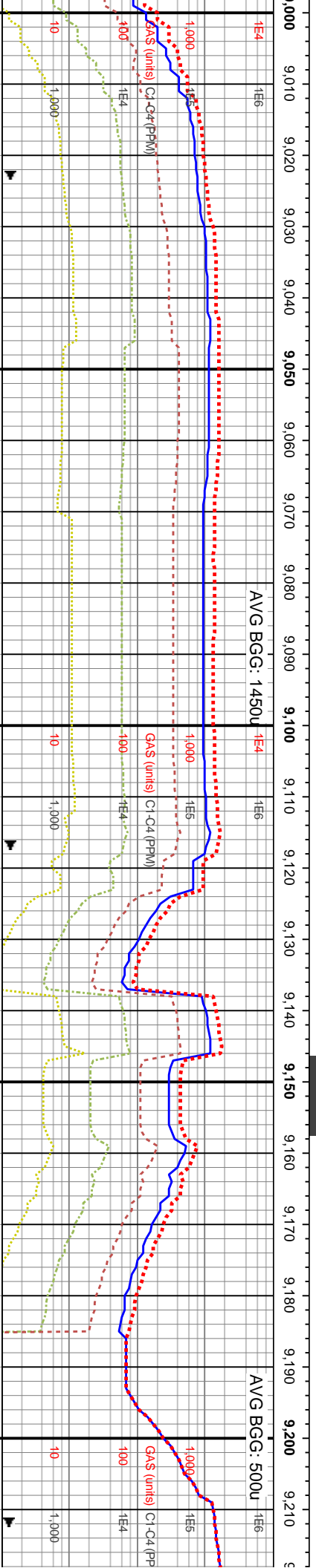
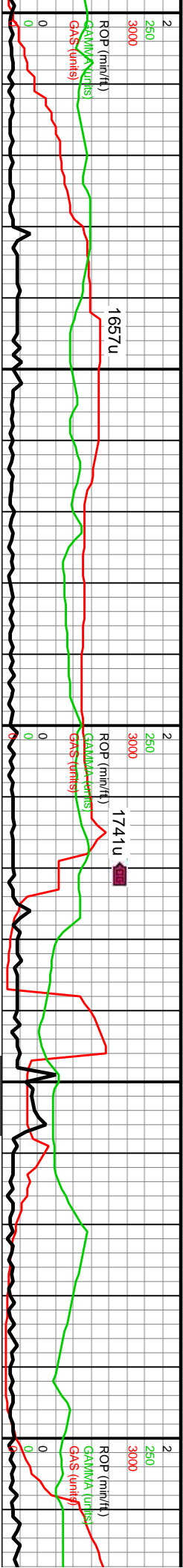


8840-8900 CHK: pred med, occ brn brn- sl
blk, bf- med gy mot thru, pred frm- sl hd, pred
sb blk- blk, ip sl- mod arg, tr mrly intbds,
mod lse cal, wht calc incl, sme pyr, sme frac fl
cal- euhd cal

8900-8960 CHK (75%): pred gy, occ lt gy, rr dk gy,
frm- brit l- mod fls sb rd- sb blk cy cigs, silty- gt tex ip, com
vf- f wh chky incl, rr thn chky lamn, tr vf pyr, rr bent, hi
calc, wi 25% MRLST: gy- dk gy, l- med hi fls sb
rd- blk- sb pty cigs, mot wi brn mrly incl, l- mod calc
wi brn mrly resd

8960-9020 CHK (75%): lt gy- gy, r
l- mod fls sb rd- sb blk cy cigs, v arg
chky incl, rr thn chky lamn ip, silty
rr bent, hi calc, MRLST (25%): gy
sb rd- blk- sb pty cigs, mot wi brn
calc wi brn mrly resd

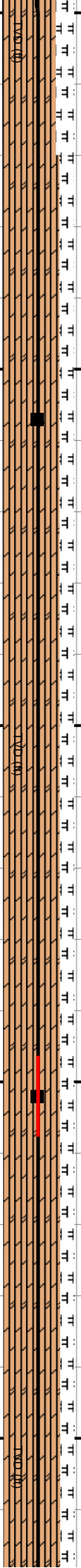




WOB: 32Klbs
Rotary: 65RRPM
Strokes: 220SPM
Pump Rate: 639GPM

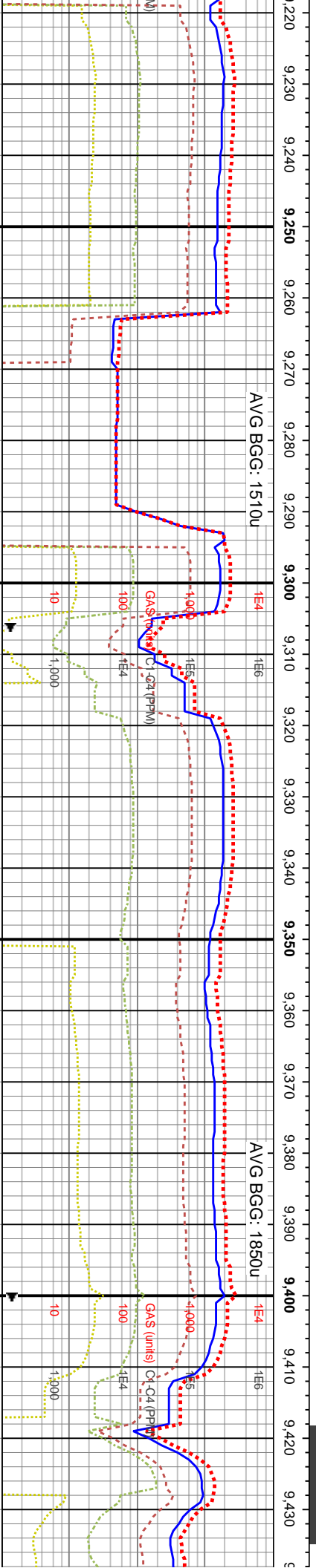
MD: 9,057'
Inclination: 91.34°
Azimuth: 269.61°
TVD: 7,139.97'
VS: 1,561.28'

MD: 9,152'
Inclination: 90.64°
Azimuth: 270.76°
TVD: 7,138.46'
VS: 1,656.12'

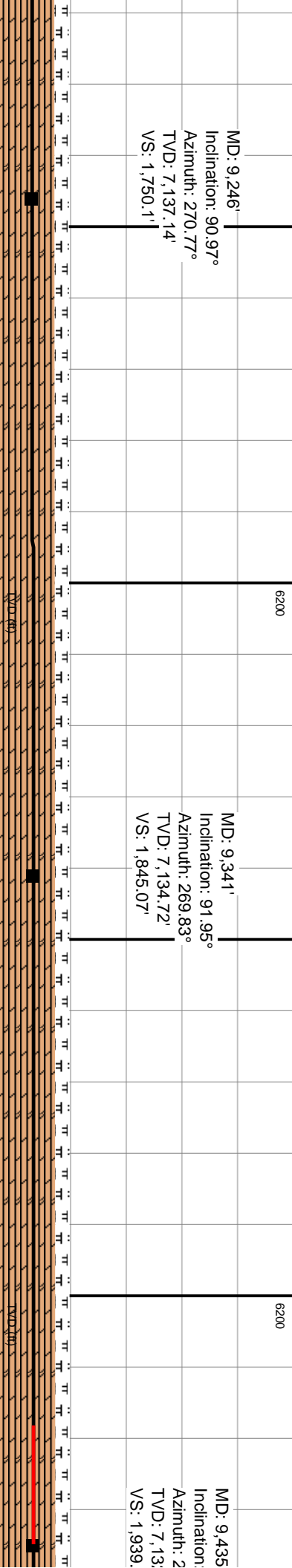


9020-9080 CHK (80%): pred gy, occ lt gy, rr dk gy, frm-brit l-mod fis sb rd-sb blkly ctgs, silty-gt tex ip, com vf-f wh chkly incl & rr c chkly incl & c free chk, rr thn chkly lamn, tr vf pyr, rr bent, hi calc, wi 20% MRLST: gy-dk gy, l-med hi fis sb rd-blky-sb ply ctgs, mot wi brn mrly incl, l-mod calc wi brn mrly resdl	9080-9140 CHK (80%): lt gy-gy, rr dk gy, frm-brit l-mod fis sb rd-sb blkly ctgs, v arg LS wi com vf-f wh chkly incl, rr thn chkly lamn ip, silty-gt tex ip, tr vf pyr, rr c free chk, rr bent, hi calc, MRLST (20%): gy-dk gy, l-med hi fis sb rd-blky-sb ply ctgs, mot wi brn mrly incl, l-mod calc wi brn mrly resdl	9140-9200 CHK (80%): pred gy, occ lt gy, rr dk gy, frm-brit l-mod fis sb rd-sb blkly ctgs, silty-gt tex ip, com vf-f wh chkly incl & rr c chkly incl & c free chk, rr thn chkly lamn, tr vf pyr, rr bent, hi calc, wi 20% MRLST: gy-dk gy, l-med hi fis sb rd-blky-sb ply ctgs, mot wi brn mrly incl, l-mod calc wi brn mrly resdl	9200-9320 C lamn, frm-brit calc, wi 20% mrly resdl
8200	8200	8200	8200

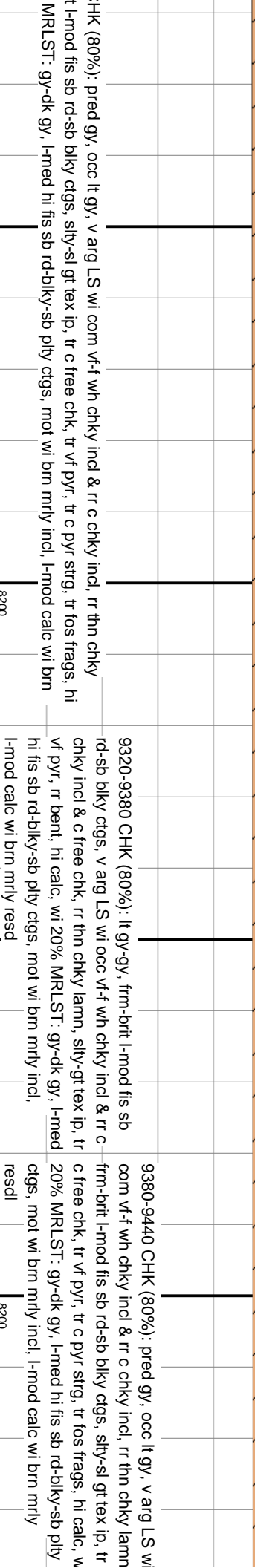




MD: 9.246'
Inclination: 90.97°
Azimuth: 270.77°
TVD: 7,137.14'
VS: 1,750.1'



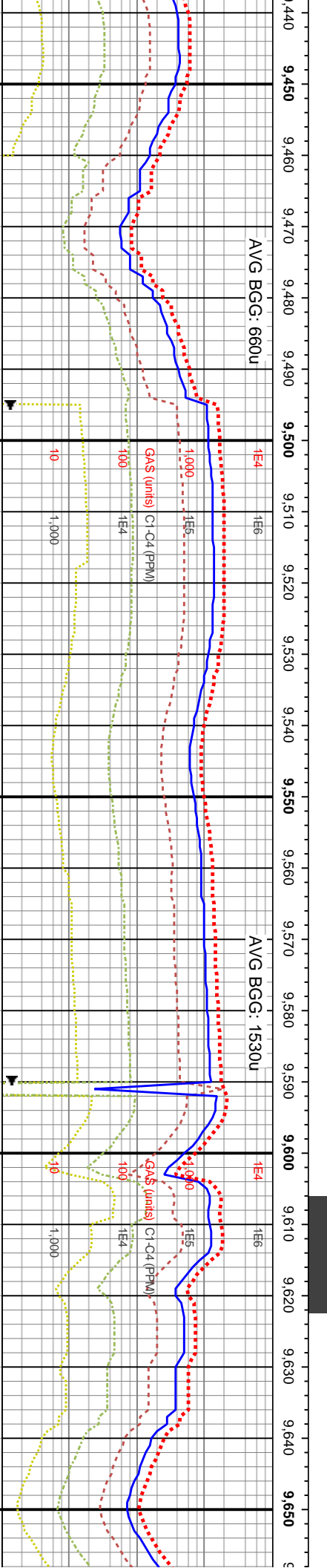
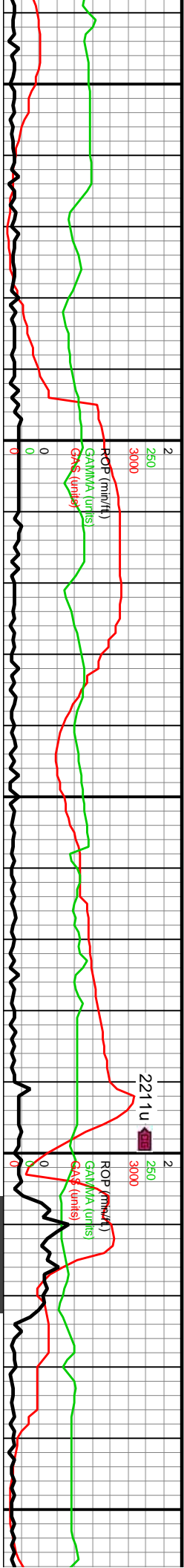
MD: 9.341'
Inclination: 91.95°
Azimuth: 269.83°
TVD: 7,134.72'
VS: 1,845.07'



9320-9380 CHK (80%): lt gy-gy, frm-brit l-mod fis sb rd-sb blkly ctgs, v arg LS wi occ vf-f wh chky incl & rr c chky incl, rr thn chky incl & c free chk, rr thn chky lamm, slty-sl gt tex ip, tr vf pyr, rr bent, hi calc, wi 20% MRLST: gy-dk gy, l-med hi fis sb rd-blky-sb ply ctgs, mot wi brn mrly incl, l-mod calc wi brn mrly resd

9380-9440 CHK (80%): pred gy, occ lt gy, v arg LS wi com vf-f wh chky incl & rr c chky incl, rr thn chky lamm frm-brit l-mod fis sb rd-sb blkly ctgs, slty-sl gt tex ip, tr c free chk, tr vf pyr, tr c pyr strg, tr fos frags, hi calc, w 20% MRLST: gy-dk gy, l-med hi fis sb rd-blky-sb ply ctgs, mot wi brn mrly incl, l-mod calc wi brn mrly resd





WOB: 23Klbs
Rotary: 65RPM
Strokes: 220SPM
Pump Rate: 639GPM

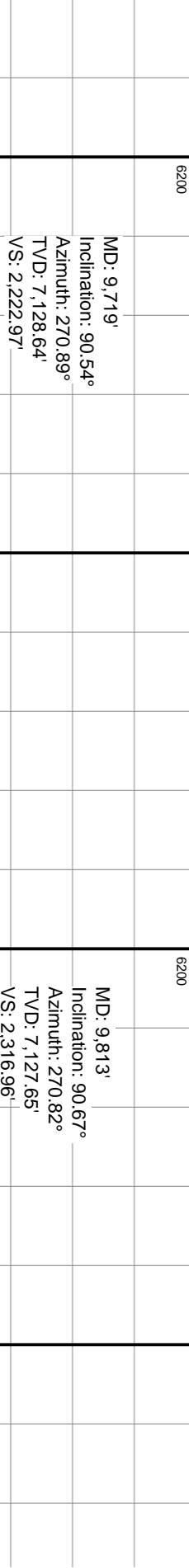
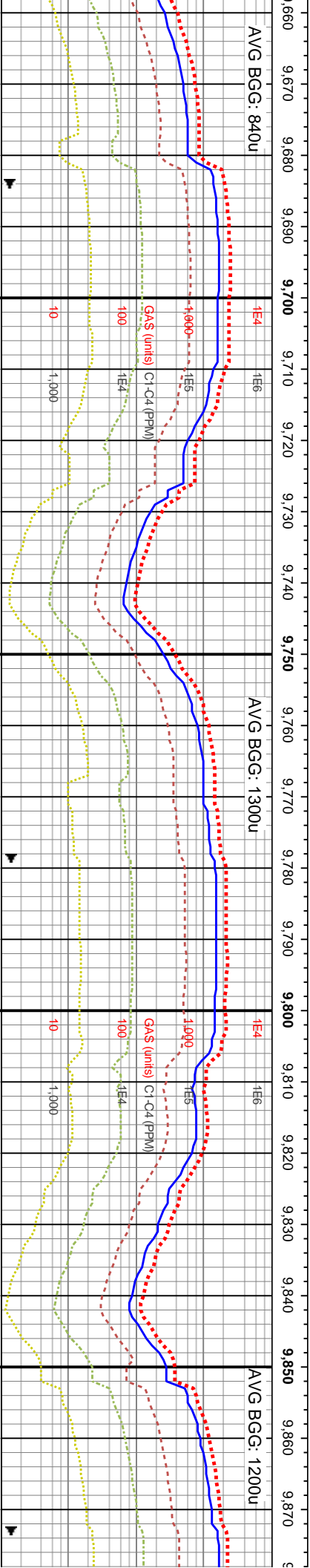
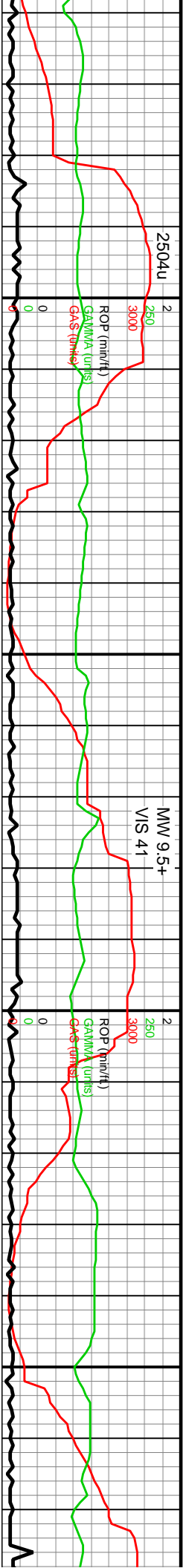
MD: 9,530'
Inclination: 91.64°
Azimuth: 270.97°
TVD: 7,131.1'
VS: 2,034.02'

9440-9560 CHK (80%): lt gy-gy, frm-brit l-mod fis sb rd-sb blk cy cgs, v arg LS wi occ vf-f wh chky incl & rr c chky incl & c free chk, rr thn chky lamm, slty-gt tex ip, tr vf pyr, rr bent, hi calc, wi 20% MRLST: gy-dk gy, l-med hi fis sb rd-blky-sb plty cgs, mot wi brn mrly incl, l-mod calc wi brn mrly resd

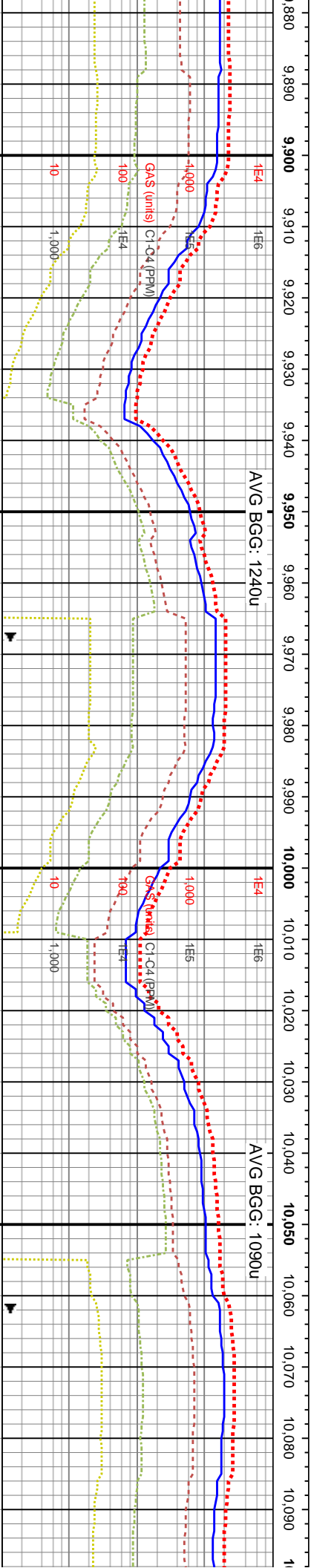
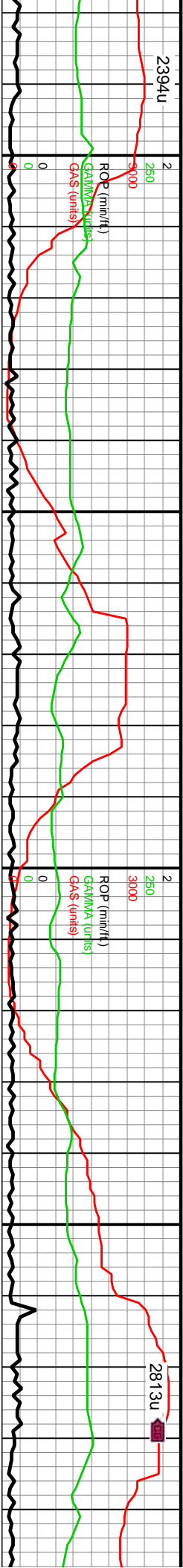
9560-9620 CHK (80%): pred gy, occ lt gy, v arg LS wi com vf-f wh chky incl & rr c chky incl, rr thn chky lamm, frm-brit l-mod fis sb rd-sb blk cy cgs, slty-sl gt tex ip, tr c free chk, tr vf pyr, tr c pyr strg, tr fos frags, hi calc, wi 20% MRLST: gy-dk gy, l-med hi fis sb rd-blky-sb plty cgs, mot wi brn mrly incl, l-mod calc wi brn mrly resd

9620-9680 CHK (70%): pred gy, o OBM stn, frm-brit l-mod fis sb rd-s- tex ip, com vf-f wh chky incl & rr c chky, tr vf pyr, hi calc, wi 30% MRL hi fis sb rd-blky-sb plty cgs, mot w l-mod calc wi brn mrly resd





cc lt gy, rr dk gy wi b blkly ctgcs, slty-gt chky incl & tr c free ST: gy-dk gy, l-med wi brn mrlly incl,	9680-9740 CHK (75%): pred gy, occ lt gy, rr dk, frm-brit l-mod fis sb rd-sb blkly v arg LS wi com vf-f-elong wh chky incl & tr c free chk, slty-gt tex ip, tr vf pyr, hi calc, MRLST (25%): gy-dk gy, l-med hi fis sb rd-blky-sb ply ctgcs, mot wi brn mrlly incl, l-mod calc wi brn mrlly resdl	8200	9740-9800 CHK (80%): pred gy, occ lt gy, rr dk gy wi OBM stn, frm-brit l-mod fis sb rd-sb blkly ctgcs, slty-gt tex ip, com vf-f wh chky incl & rr c chky incl & tr c free chk, tr vf pyr, hi calc, wi 20% MRLST: gy-dk gy, l-med hi fis sb rd-blky-sb ply ctgcs, mot wi brn mrlly incl, l-mod calc wi brn mrlly resdl	8200	9800-9860 CHK (75%): pred gy, occ lt gy, rr dk, frm-brit l-mod fis sb rd-sb blkly v arg LS wi com vf-f-elong wh chky incl & tr c free chk, slty-gt tex ip, tr vf pyr, hi calc, MRLST (25%): gy-dk gy, l-med hi fis sb rd-blky-sb ply ctgcs, mot wi brn mrlly incl, l-mod calc wi brn mrlly resdl	8200	9860-9980 CHK (75%): pred gy, occ lt gy, rr dk, frm-brit l-mod fis sb rd-sb blkly v arg LS wi com vf-f-elong wh chky incl & tr c free chk, slty-gt tex ip, tr vf pyr, hi calc, MRLST (25%): gy-dk gy, l-med hi fis sb rd-blky-sb ply ctgcs, mot wi brn mrlly incl, l-mod calc wi brn mrlly resdl	8200
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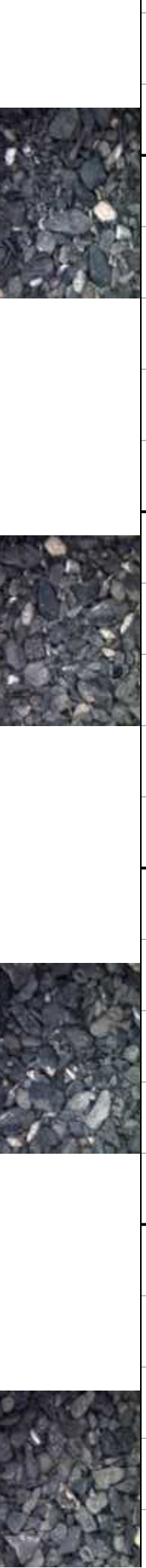


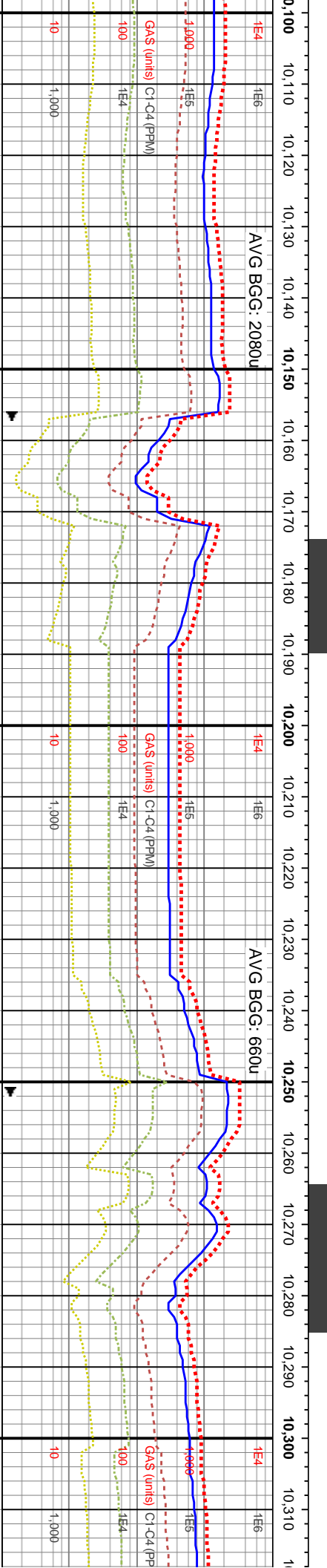
MD: 9,908'
Inclination: 90.1°
Azimuth: 271.22°
TVD: 7,127.01'
VS: 2,411.95'

MD: 10,002'
Inclination: 89.97°
Azimuth: 272.62°
TVD: 7,126.95'
VS: 2,505.9'

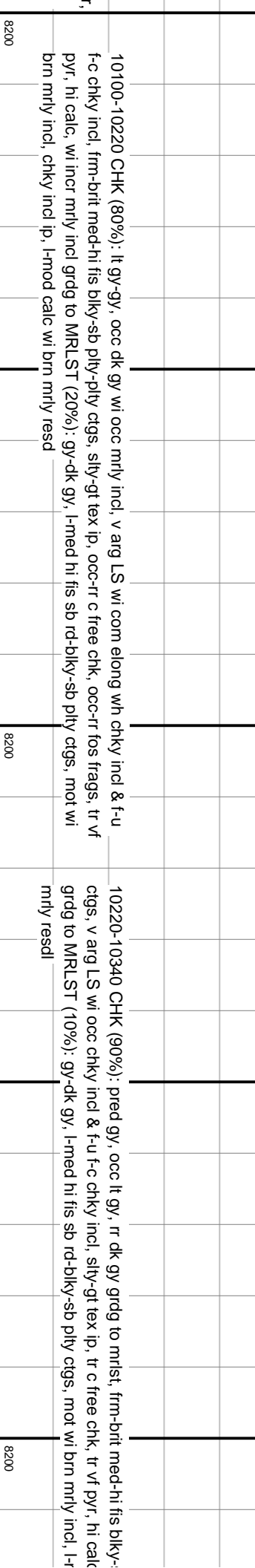
MD: 10,010'
Inclination:
Azimuth:
TVD: 7,126.60°
VS: 2,600.00'

9980-10040 CHK (90%): pred gy, occ lt gy, r dk gy grdg to mrlst, frm-brit med-hi fis blk-ly-sb ply-ply cigs, v arg LS wi com along wh chky incl & f-u f-c chky incl, slty-gt tex ip, occ-r c free chk, occ-r fos frags, tr vf pyr, hi calc, wi incr mrlly incl grdg to MRLST (10%): gy-dk gy, l-med hi fis sb rd-blk-ly-sb ply cigs, mot wi brn mrlly incl, l-mod calc wi brn mrlly resdl	8200
10040-10100 CHK (80%): lt gy-gy, occ dk gy wi occ mrlly incl, v arg LS wi com along wh chky incl & f-u f-c chky incl, frm-brit med-hi fis blk-ly-sb ply-ply cigs, slty-gt tex ip, occ-r c free chk, occ-r fos frags, tr vf pyr, hi calc, wi incr mrlly incl grdg to MRLST (20%): gy-dk gy, l-med hi fis sb rd-blk-ly-sb ply cigs, mot wi brn mrlly incl, chky incl ip, l-mod calc wi brn mrlly resdl	8200

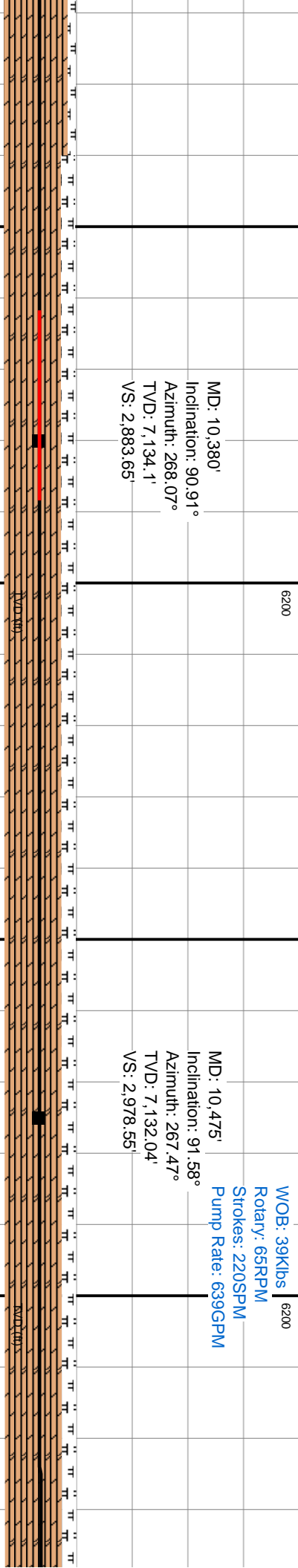
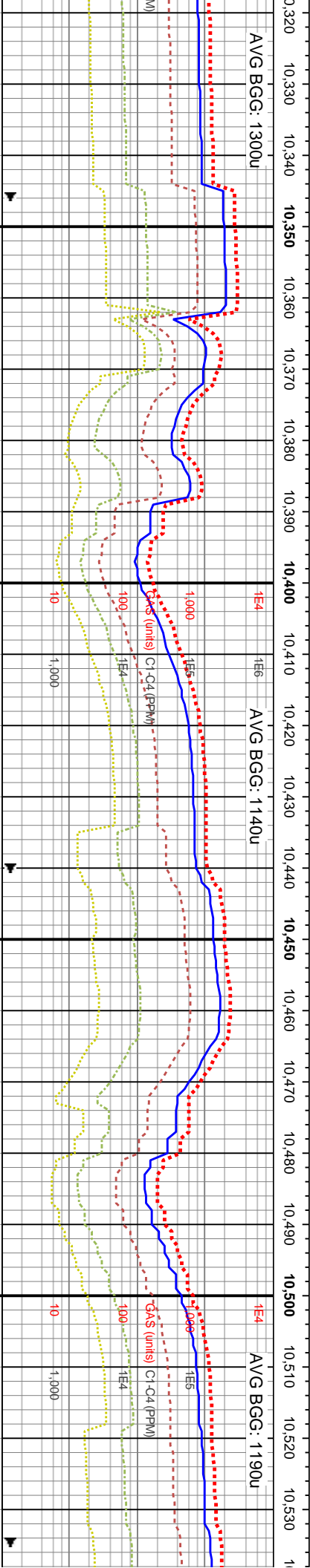
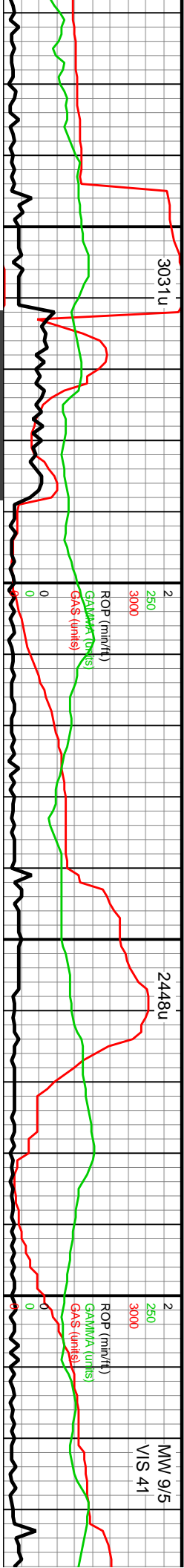




MD: 10,286'
Inclination: 88.59°
Azimuth: 269.84°
TVD: 7,133.68'
VS: 2,789.69'



10220-10340 CHK (90%): pred gy, occ lt gy, tr dk gy grdg to mrlst, frm-brit med-hi fis biky-
ctigs, v arg LS wi occ chky incl & t-u f-c-chky incl, sily-gt tex ip, tr c free chk, tr vf pyr, hi calc
grdg to MRLST (10%): gy-dk gy, l-med hi fis sb rd-biky-sb pily ctigs, mot wi brn mrlly incl, l-r
mrlly resld

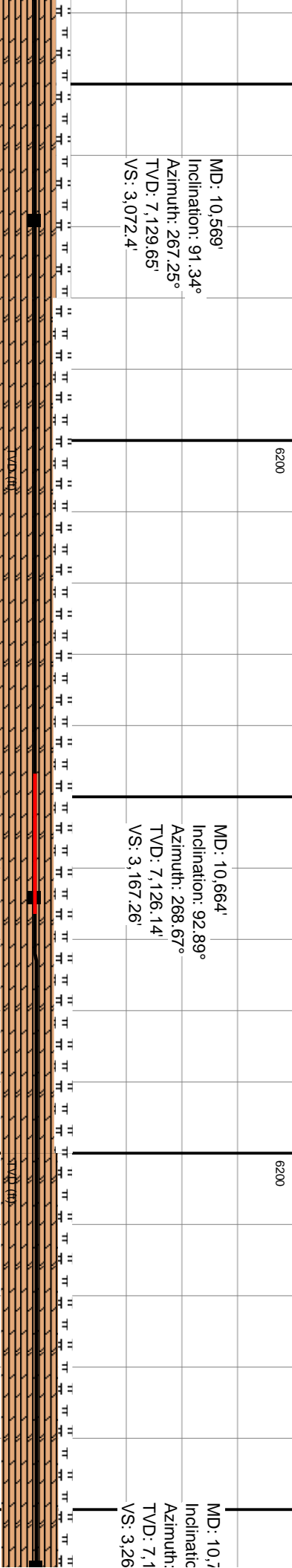
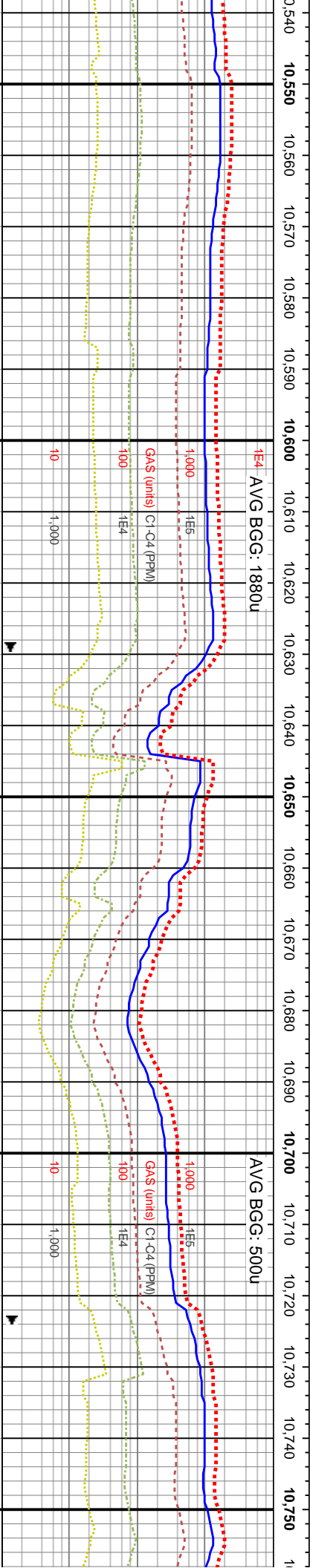
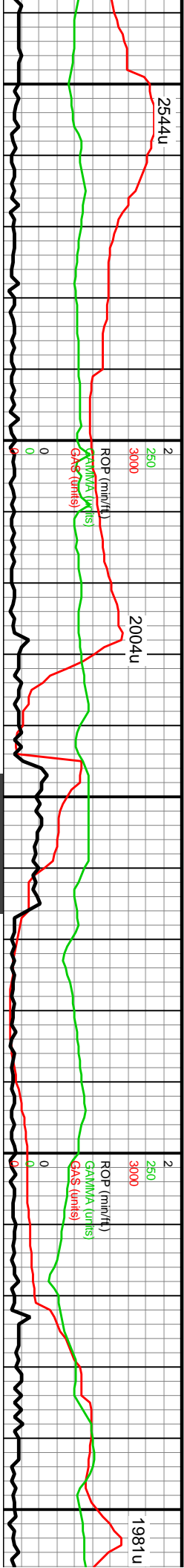


10340-10400 CHK (80%): pred gy, occ lt gy, rr dk gy grdg to mrlst, frm-brit med-hi fis blk-y-sb pty-pty ctgs, v arg LS wi com along wh chky incl & f-u f-c chky incl, sily-gt tex ip, occ-rr c free chk, occ-rr fos frags, tr vf pyr, hi calc, wi 20% MRLST: gy-dk gy, l-med hi fis sb rd-blky-sb pty ctgs, mot wi brn mrlly incl, l-mod calc wi brn mrlly resdl	10400-10460 CHK (80%): lt gy-gy, occ dk gy wi occ mrlly incl, v arg LS wi com along wh chky incl & f-u f-c chky incl, frm-brit med-hi fis blk-y-sb pty-pty ctgs, sily-gt tex ip, occ-rr c free chk, occ-rr fos frags, tr vf pyr, hi calc, wi incr mrlly incl grdg to MRLST (20%): gy-dk gy, l-med hi fis sb rd-blky-sb pty ctgs, mot wi brn mrlly incl, chky incl ip, l-mod calc wi brn mrlly resdl	10460-10520 CHK (80%): pred gy, occ lt gy, rr dk gy grdg to mrlst, frm-brit med-hi fis blk-y-sb pty-pty ctgs, v arg LS wi com along wh chky incl & f-u f-c chky incl, sily-gt tex ip, occ-rr c free chk, occ-rr fos frags, tr vf pyr, hi calc, wi 20% MRLST: gy-dk gy, l-med hi fis sb rd-blky-sb pty ctgs, mot wi brn mrlly incl, l-mod calc wi brn mrlly resdl	10520-10580 Cht mrlly incl, v arg L chky incl, frm-brit sily-gt tex ip, occ-rr hi calc, wi incr rr gy, l-med hi fis s incl, chky incl ip,
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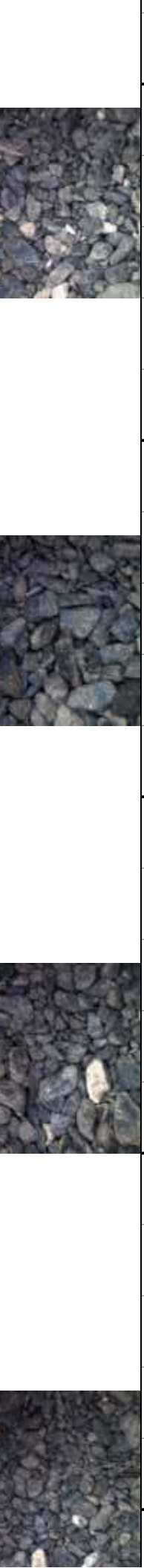
MD: 10,380'
Inclination: 90.91°
Azimuth: 268.07°
TVD: 7,134.1'
VS: 2,883.65'

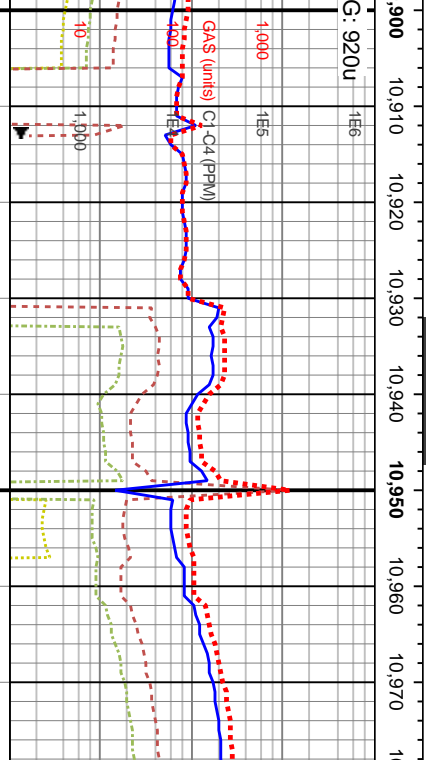
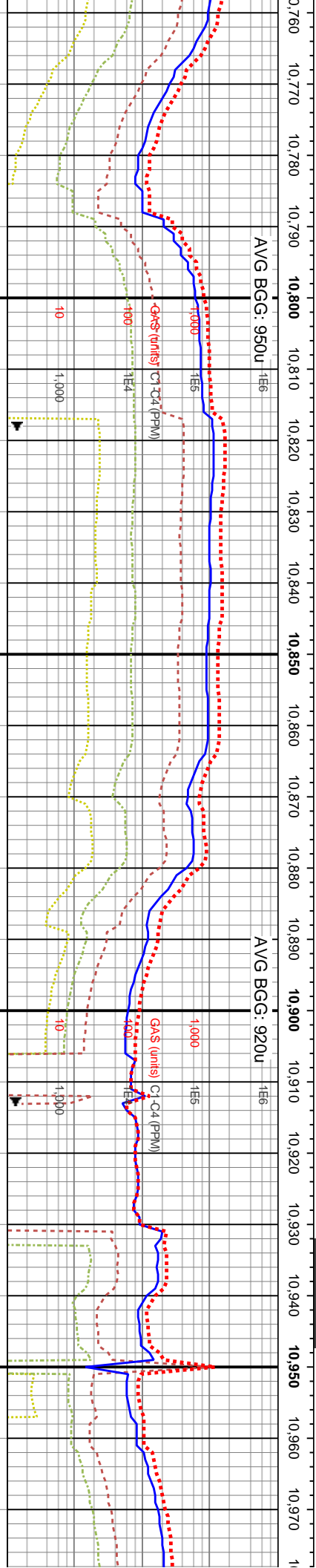
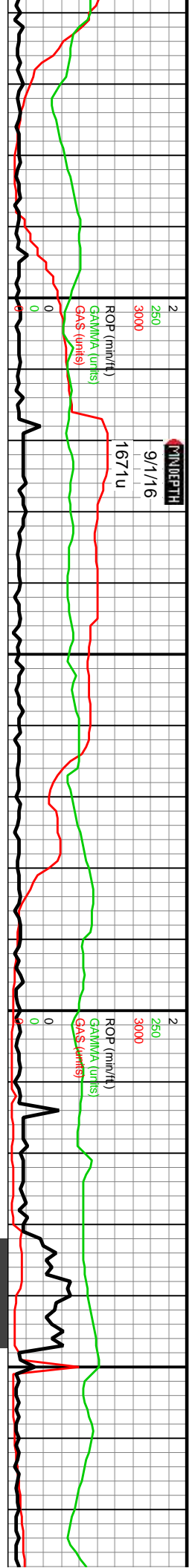
MD: 10,475'
Inclination: 91.58°
Azimuth: 267.47°
TVD: 7,132.04'
VS: 2,978.55'

WOB: 39Klbs
Rotary: 65RPM
Strokes: 220SPM
Pump Rate: 639GPM



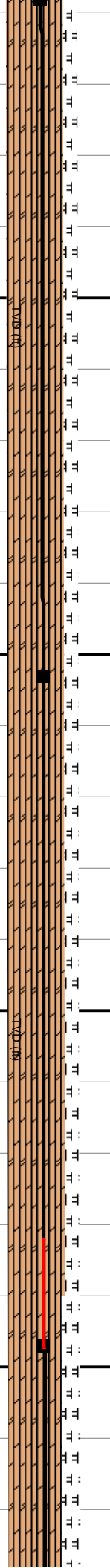
MD: 10.569' Inclination: 91.34° Azimuth: 267.25° TVD: 7,129.65' VS: 3,072.4'	10580-10640 CHK (75%): lt gy-gy, frm-brit mod fis sb blk-y-sb pty ctgs, v arg LS wi com along f-u f-c chky incl, silty-gt tex ip, rr c free chk, rr fos frags, tr vf pyr, hi calc, wi 25% MRLST: gy-dk gy, l-med hi fis sb rd-bkly-sb pty ctgs, mot wi brn mrly incl, l-mod calc wi brn mrly resdl	10640-10700 CHK (75%): lt gy-gy, occ dk gy wi occ mrly incl, v arg LS wi com along wh chky incl & f-u f-c chky incl, frm-brit mod fis sb blk-y-sb pty ctgs, silty-gt tex ip, rr c free chk, rr fos frags, tr vf pyr, hi calc, wi incr mrly incl grdg to MRLST (25%): gy-dk gy, l-med hi fis sb rd-bkly-sb pty ctgs, mot wi brn mrly incl & occ chky incl, l-mod calc wi brn mrly resdl	10700-10760 CHK (80%): lt gy-gy, frm-brit mod fis sb blk-y-sb pty ctgs, v arg LS wi com along f-u f-c chky incl, silty-gt tex ip, rr c free chk, rr fos frags, tr v pyr, hi calc, wi 20% MRLST: gy-dk gy, l-med hi fis sb rd-bkly-sb pty ctgs, mot wi brn mrly incl, l-mod calc wi brn mrly resdl





MD: 10,853'
Inclination: 93.66°
Azimuth: 268.64°
TVD: 7,114.71'
VS: 3,355.86'

MD: 10,947'
Inclination: 91.78°
Azimuth: 270.26°
TVD: 7,110.26'
VS: 3,449.74'

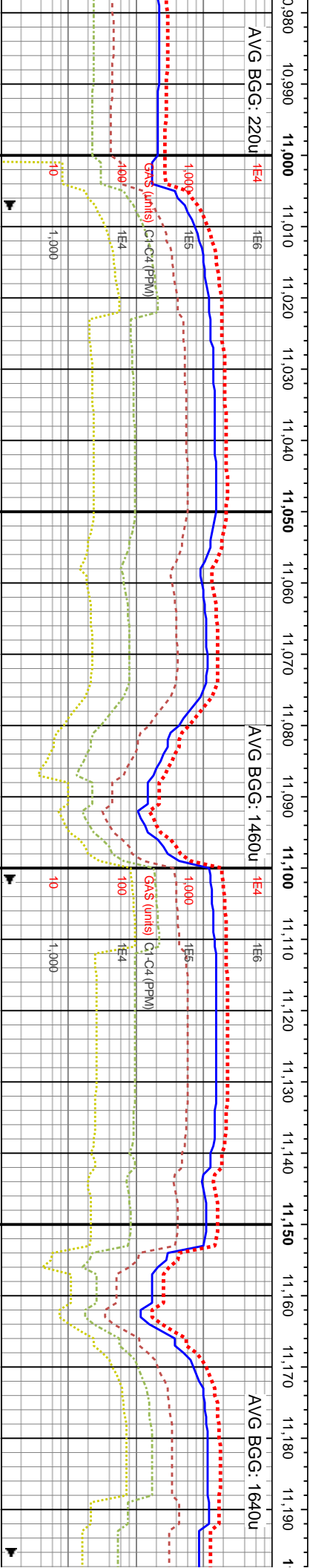


10760-10820 CHK (80%): It gy-gy, occ dk gy wi occ mrlly incl, v arg LS wi com along wh chky incl & f-u f-c chky incl, frm-brit mod fis sb blkly-sb pty ctgs, slty-gt tex ip, tr c free chk, tr fos frags, tr vf pyr, hi calc, wi incr mrlly incl grdg to MRLST (20%): gy-dk gy, l-med hi fis sb rd-blky-sb pty ctgs, mot wi brn mrlly incl & occ chky incl, l-mod calc wi brn mrlly resd

10820-10940 CHK (80%): It gy-gy, frm-brit mod fis sb blkly-sb pty ctgs, v arg LS wi com chky incl & thn chky lamn, occ-tr c free chk thru, slty-gt tex ip, tr fos frags, tr cal, tr vf pyr, hi calc, wi 20% MRLST: gy-dk gy, l-med hi fis sb rd-blky-sb pty ctgs, mot wi brn mrlly incl, l-mod calc wi brn mrlly resd

10940-11060 CHK (75%): It gy-gy, frm-brit mod fis sb blkly-sb pty ctgs, v arg LS wi com chky incl & thn chky incl, frm-brit mod fis sb blkly-sb pty ctgs, mot wi brn mrlly incl, l-mod calc wi brn mrlly resd

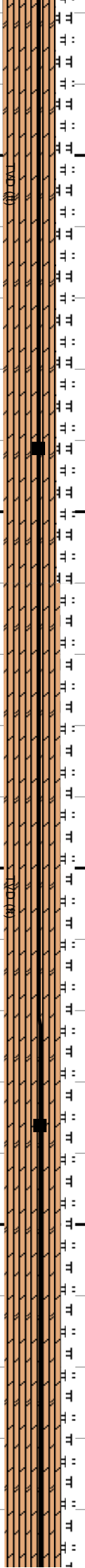




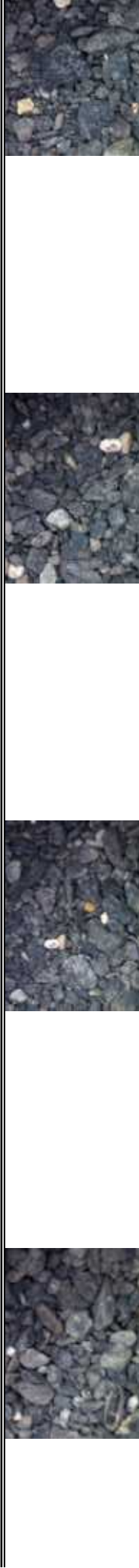
WOB: 38Klbs
Rotary: 65RPM
Strokes: 220SPM
Pump Rate: 639GPM

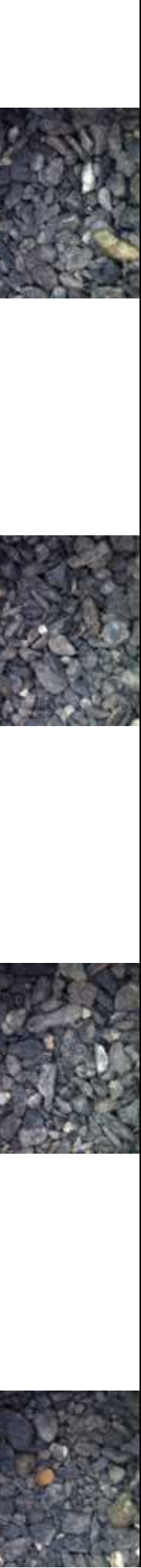
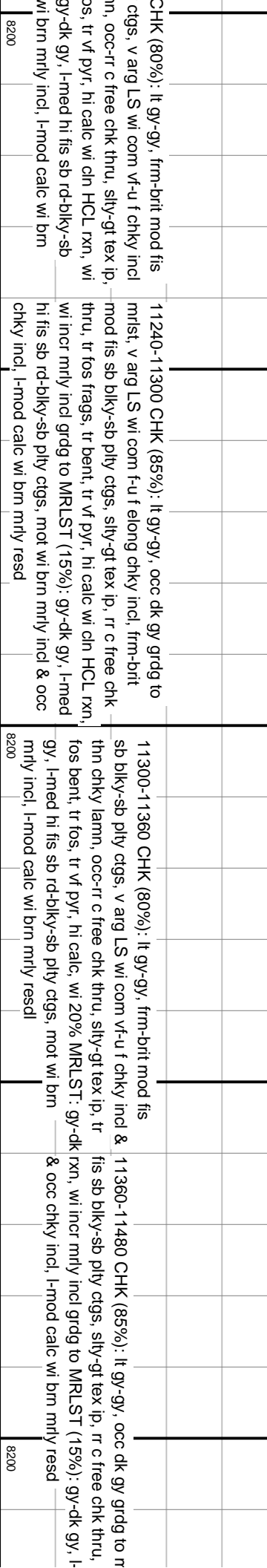
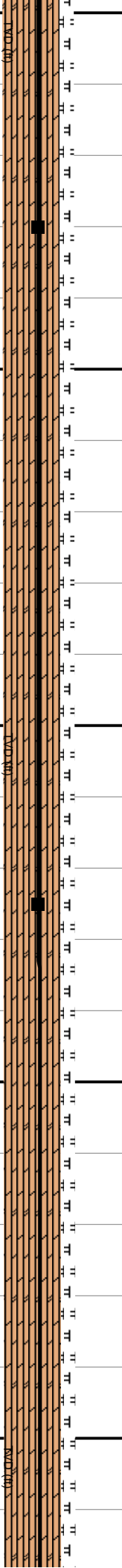
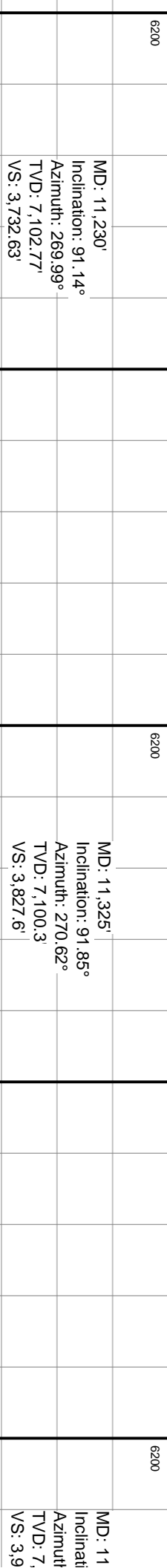
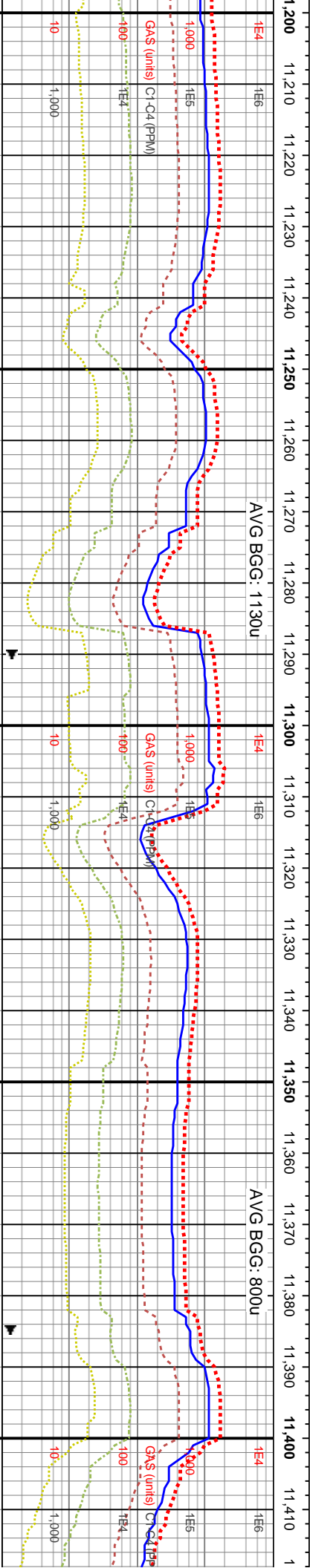
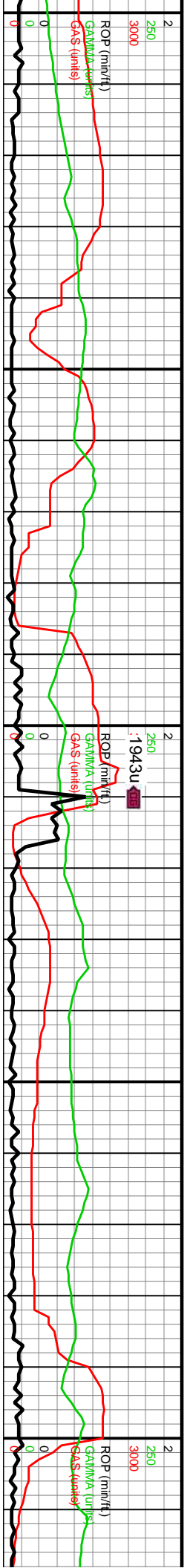
MD: 11,041'
Inclination: 91.81°
Azimuth: 270.77°
TVD: 7,107.31'
VS: 3,543.69'

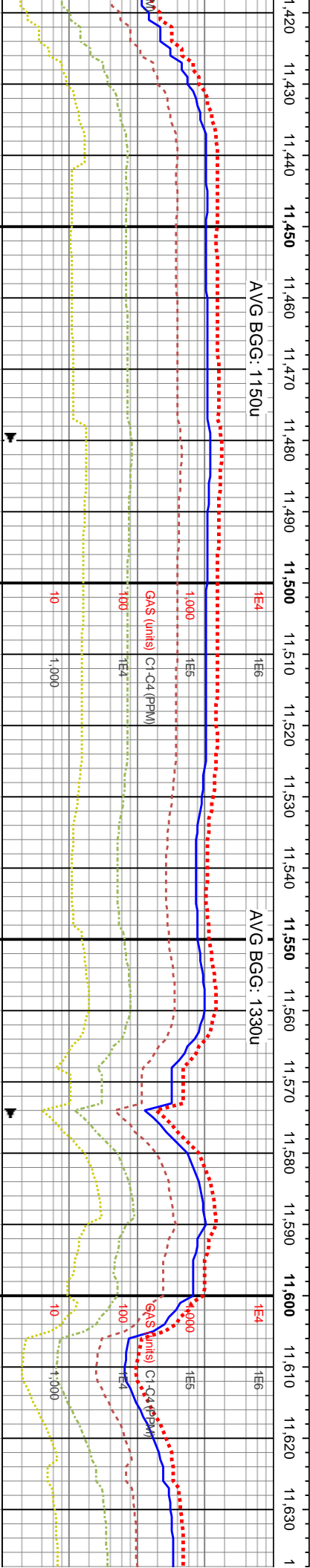
MD: 11,136'
Inclination: 91.27°
Azimuth: 270.2°
TVD: 7,104.75'
VS: 3,638.65'



gy, occ dk gy wi occ mrlly incl, v arg LS wi com along wh chky incl & f-u f-c sily-gt tex ip, tr c free chk, tr fos frags, tr cal, tr vf pyr, hi calc, (25%): gy-dk gy, l-med hi fis sb rd-bkly-sb plty ctgs, mot wi brn mrlly incl & mrlly resd	8200	11060-11120 CHK (80%): lt gy-gy, frm-brit mod fis sb bkly-sb plty ctgs, v arg LS wi com chky incl & thn chky lamn, occ-r-r c free chk thru, sily-gt tex ip, tr fos frags, tr cal, tr vf pyr, hi calc, wi 20% MRLST: gy-dk gy, l-med hi fis sb rd-bkly-sb plty ctgs, mot wi brn mrlly incl, l-mod calc wi brn mrlly resd	8200	11120-11180 CHK (85%): lt gy-gy, occ dk gy grdg to mrlst, v arg LS wi com f-u f elong chky incl, frm-brit mod fis sb bkly-sb plty ctgs, sily-gt tex ip, tr c free chk thru, tr fos frags, tr bent, tr vf pyr, hi calc, wi incr mrlly incl grdg to MRLST (15%): gy-dk gy, l-med hi fis sb rd-bkly-sb plty ctgs, mot wi brn mrlly incl & occ chky incl, l-mod calc wi brn mrlly resd	11180-11240 sb bkly-sb plty & thn chky lar tr fos bent, tr fi 20% MRLST: plty ctgs, mot mrlly resd
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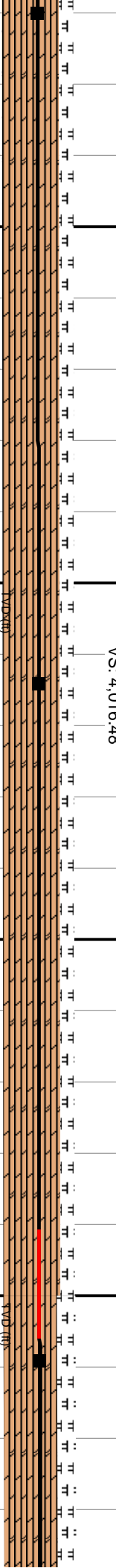




WOB: 28Klbs
Rotary: 65RPM
Strokes: 220SPM
Pump Rate: 640GPM

MD: 11,514'
Inclination: 91.71°
Azimuth: 270.37°
TVD: 7,093.71'
VS: 4,016.48'

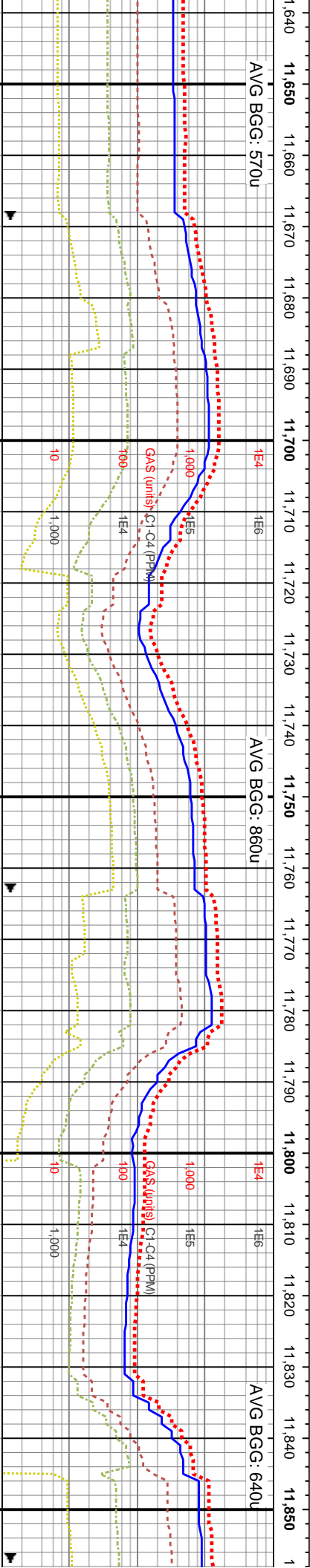
MD: 11,609'
Inclination: 93.22°
Azimuth: 271.01°
TVD: 7,089.62'
VS: 4,111.38'



11480-11600 CHK (80%): lt gy-gy, frm-brit mod fis sb blkly-sb pty ctgs, v arg LS wi com v-f-u f chky incl & thn chky lamn, occ-rr c free chk thru, silty-gt tex ip, tr bent, tr acic fos frags, tr vf pyr, hi calc, wi 20% MRLST: gy-dk gy, l-med hi fis sb rd-blky-sb pty ctgs, mot wi brn mrly incl, l-mod calc wi brn mrly resdl

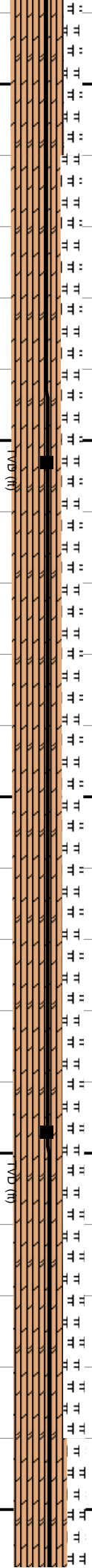
11600-11660 CHK (75%): lt gy-gy, wi com f-u f along chky incl, frm-brit blkly-sb pty ctgs, silty-gt tex ip, rr c 1 ip, tr fos frags, tr vf pyr, hi calc wi chl MRLST (25%): gy-dk gy, l-med hi fi ctgs, mot wi brn mrly incl & occ chk wi brn mrly resd





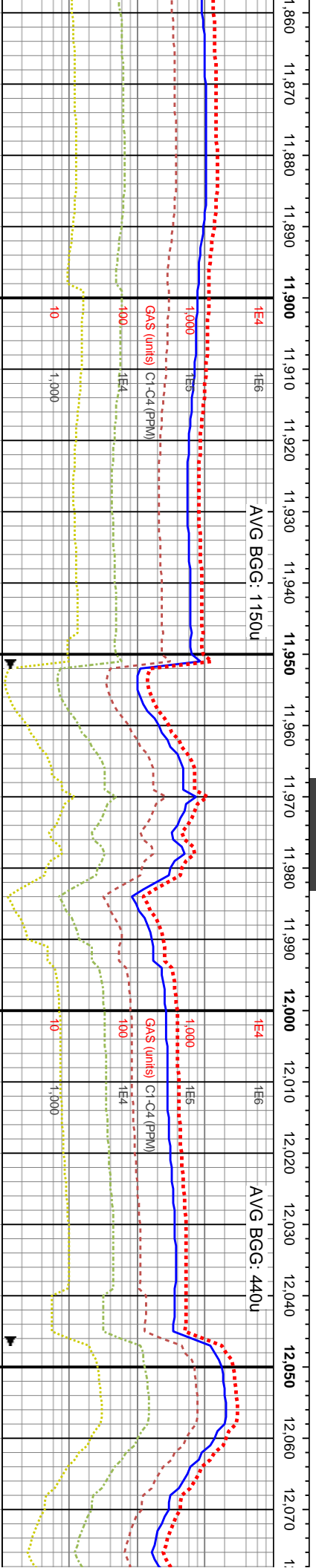
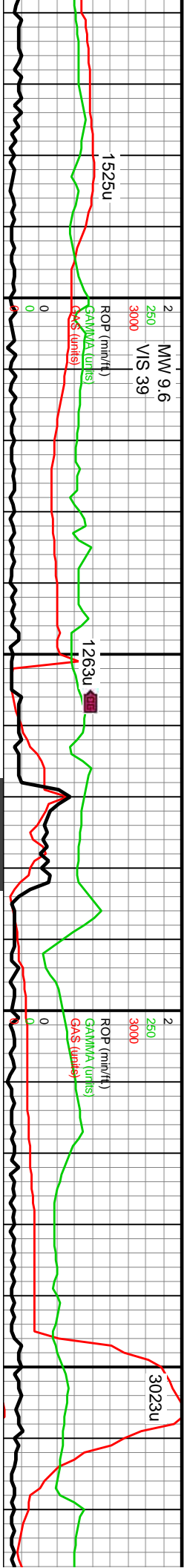
MD: 11,703'
Inclination: 93.59°
Azimuth: 271.8°
TVD: 7,084.03'
VS: 4,205.19'

MD: 11,797'
Inclination: 91.85°
Azimuth: 270.14°
TVD: 7,079.57'
VS: 4,299.07'

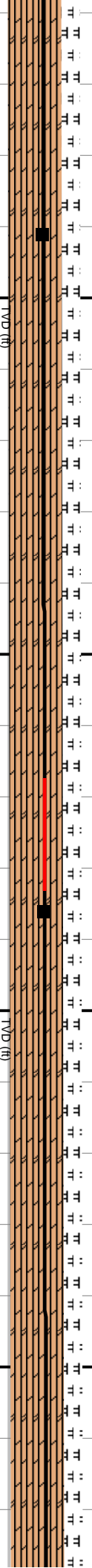


occ dk gy, v arg LS	11660-11720 CHK (70%): lt gy-gy, frm-brit l-mod fis sb rd-sb blk-y-sb pty ctgs, v arg LS wi com vf-u f chky incl & thn chky lamn, tr c free chk thru, silty-gt tex ip, tr fos frags, tr vf pyr, hi calc, wi 30% MRLST; pred dk gy, occ gy mot wi brn mrly incl, l-med hi fis sb rd-blky-sb pty ctgs, l-mod calc wi brn mrly resd	11720-11780 CHK (70%): lt gy-gy, occ dk gy, v arg LS wi com f-u f elong chky incl, frm-brit l-mod fis sb rd-sb blk-y-sb pty ctgs, silty-gt tex ip, tr c free chk wi dis pyr ip, tr fos frags, tr vf pyr, hi calc wi cln HCL rxn, gridg to MRLST (30%): gy-dk gy, l-med hi fis sb rd-blky-sb pty ctgs, mot wi brn mrly incl & occ chky incl, l-mod calc wi brn mrly resd	11780-11840 CHK (70%): lt gy-gy, frm-brit l-mod fis sb rd-sb blk-y-sb pty ctgs, v arg LS wi com vf-u f chky incl & thn chky lamn, tr c free chk thru, silty-gt tex ip, tr fos frags, tr vf pyr, hi calc, wi 30% MRLST; pred dk gy, occ gy mot wi brn mrly incl, l-med hi fis sb rd-blky-sb pty ctgs, l-mod calc wi brn mrly resd	11840-11900 CI l-mod fis sb rd-s vf-u f chky incl & chk thru, tr vf py wi 25% MRLST; incl, l-med hi fis wi brn mrly resd
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MD: 11,891'
Inclination: 91.68°
Azimuth: 270.69°
TVD: 7,076.68'
VS: 4,393.03'



CHK (75%): It gy-gy-It gy brn, frm-brit
b blkly-sb ply ctgs, v arg LS wi com
thn chky lamm, silty-gt tex ip, rr c free
r & vf pyr strg, hi calc wi cin HCL rxn,
pred dk gy, occ gy mot wi brn mrlly
ctgs, rd-bkly-sb ply ctgs, l-mod calc

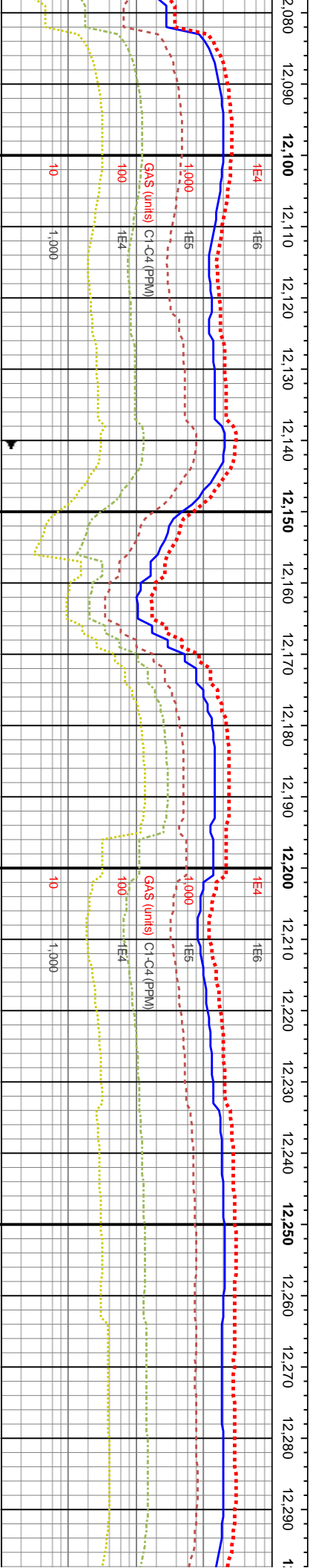
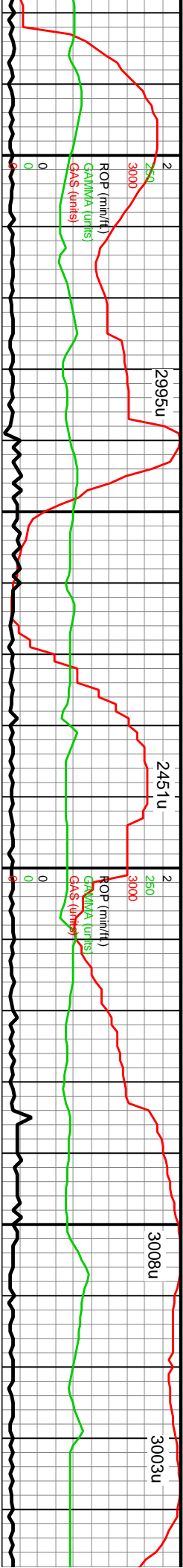
11900-11960 CHK (75%): It gy-gy-It gy brn, v arg LS
wi com f-u f along chky incl, frm-brit l-mod fis sb rd-sb
blkly-sb ply ctgs, silty-gt tex ip, rr c free chk wi dis pyr
ip, tr vf pyr & pyr strg, hi calc wi cin HCL rxn, grdg to
MRLST (25%): gy-dk gy, l-med hi fis sb rd-bkly-sb ply
ctgs, mot wi brn mrlly incl & occ chky incl, l-mod calc
wi brn mrlly resd

11960-12020 CHK (75%): It gy-gy-It gy brn, frm-brit
l-mod fis sb rd-sb blkly-sb ply ctgs, v arg LS wi com
vf-u f chky incl & thn chky lamm, silty-gt tex ip, rr c free
chk thru, tr vf pyr & vf pyr strg, hi calc wi cin HCL rxn,
wi 25% MRLST: pred dk gy, occ gy mot wi brn mrlly
incl, l-med hi fis sb rd-bkly-sb ply ctgs, l-mod calc wi
brn mrlly resd

12020-12080 CHK (75%): It gy-gy-It gy brn, frm-brit
l-mod fis sb rd-sb blkly-sb ply ctgs, v arg LS wi
com vf-u f chky incl & thn chky lamm, silty-gt tex ip, r
c free chk thru, tr vf pyr & vf pyr strg, hi calc wi cin
HCL rxn, wi 25% MRLST: pred dk gy, occ gy mot w
brn mrlly incl, l-med hi fis sb rd-bkly-sb ply ctgs,
l-mod calc wi brn mrlly resd

WOB: 40Klbs
Rotary: 65RPM
Strokes: 220SPM
Pump Rate: 638GPM

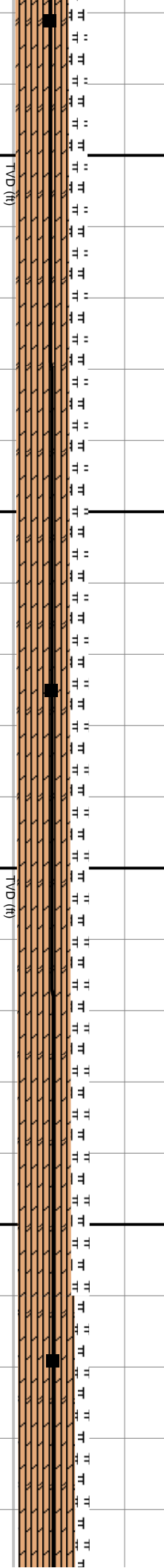
MD: 11,986'
Inclina
Azimu
TVD: 7
VS: 4,4



DP 6200

MD: 12,175'
Inclination: 93.62°
Azimuth: 270.64°
TVD: 7,061.35'
VS: 4,676.74'

MD: 12,269'
Inclination: 92.75°
Azimuth: 271.3°
TVD: 7,056.12'
VS: 4,770.58'



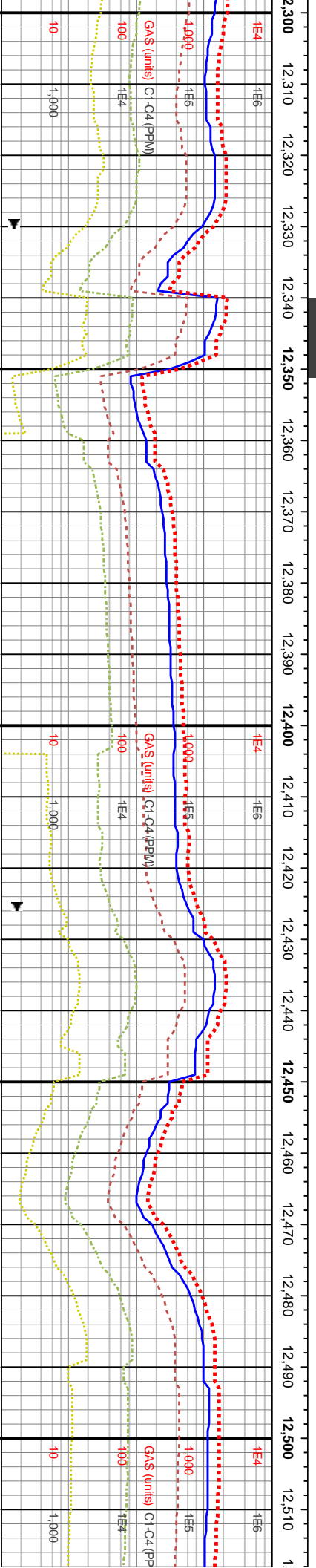
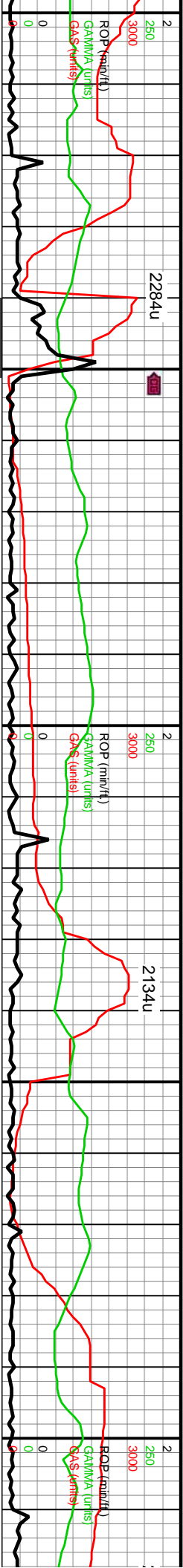
12080-12140 CHK (80%): pred medgy, abnt dk gy, occ brn- sl blk, bf- med gy mot thru, pred frm- sl hd, pred sb blk- blk, sl- mod arg, mod lse euhed cal, calc incl, tr pyr; MRLST (20%): dk- med gy, sme sl blk, sb blk, sl frm- frm, mod- v arg, cal incl, tr frac fl cal

12140-12200 CHK (80%): pred medgy, abnt dk gy, occ brn- sl blk, bf- med gy mot thru, pred frm- sl hd, pred sb blk- blk, sl- mod arg, mod lse euhed cal, calc incl, tr pyr; MRLST (20%): dk- med gy, sme sl blk, sb blk, sl frm- frm, mod- v arg, cal incl, tr frac fl cal

12200-12260 CHK (80%): pred medgy, abnt dk gy, occ brn- sl blk, bf- med gy mot thru, pred frm- sl hd, pred sb blk- blk, sl- mod arg, mod lse euhed cal, calc incl, tr pyr; MRLST (20%): dk- med gy, sme sl blk, sb blk, sl frm- frm, mod- v arg, cal incl, tr frac fl cal

12260-12320 CHK (70%): pred medgy, abnt dk gy, occ brn- sl blk, bf- med gy mot thru, pred frm- sl hd, pred sb blk- blk, sl- mod arg, mod lse euhed cal, calc incl, tr pyr; MRLST (20%): dk- med gy, sme sl blk, sb blk, sl frm- frm, mod- v arg, cal incl, tr frac fl cal

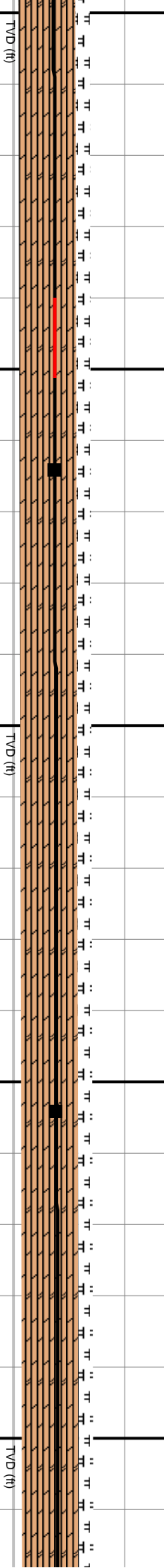




MD: 12,364'
Inclination: 93.93°
Azimuth: 270.21°
TVD: 7,050.59'
VS: 4,865.41'

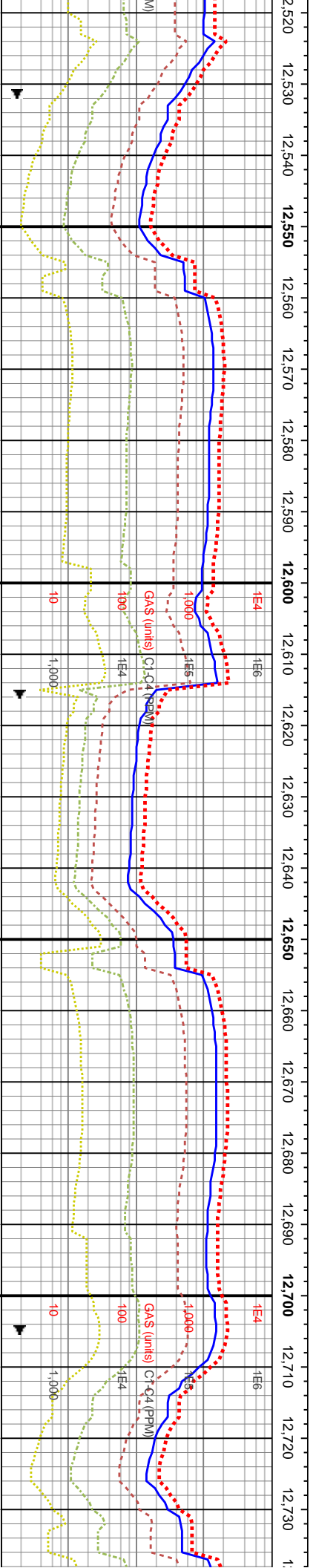
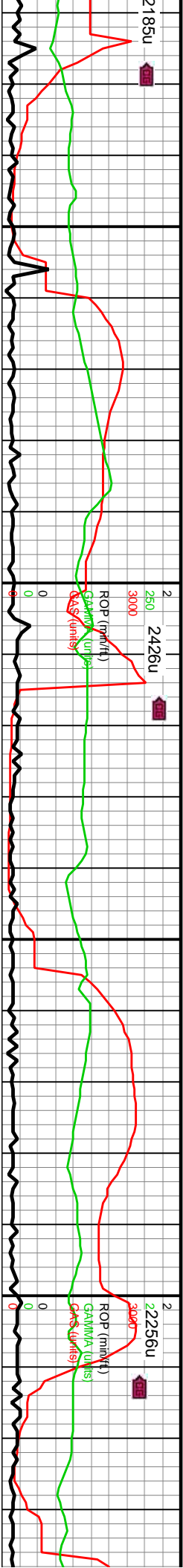
MD: 12,454'
Inclination: 93.82°
Azimuth: 270.49°
TVD: 7,044.51'
VS: 4,955.21'

WOB: 41Klbs
Rotary: 65RPM
Strokes: 220SPM
Pump Rate: 639GPM



12320-12380 CHK (70%): pred medgy, abnt dk gy, occ brn- sl blk, bf- med gy mot thru, pred frm- sl hd, pred sb blk- blk, sl- mod arg, occ lse euhed cal, calc incl, tr pyr; MRLST (30%): dk- med gy, sme sl blk, sb blk, sl frm- frm, mod- v arg, cal incl, tr frac fl cal	12380-12440 CHK (70%): pred medgy, abnt dk gy, occ brn- sl blk, bf- med gy mot thru, pred frm- sl hd, pred sb blk- blk, sl- mod arg, occ lse euhed cal, calc incl, tr pyr; MRLST (30%): dk- med gy, sme sl blk, sb blk, sl frm- frm, mod- v arg, cal incl, tr frac fl cal	12440-12500 CHK (70%): pred medgy, abnt dk gy, occ brn- sl blk, bf- med gy mot thru, pred frm- sl hd, pred sb blk- blk, sl- mod arg, occ lse euhed cal, calc incl, tr pyr; MRLST (30%): dk- med gy, sme sl blk, sb blk, sl frm- frm, mod- v arg, cal incl, tr frac fl cal
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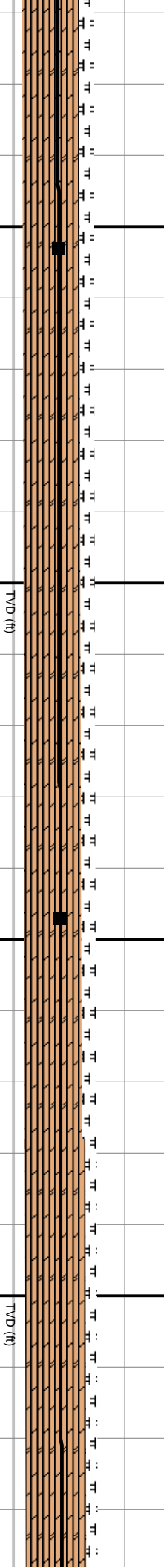




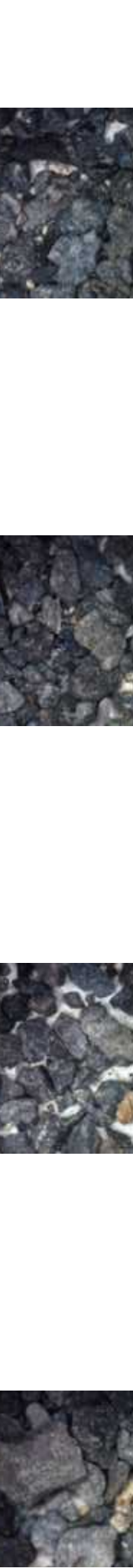
MD: 12,553'
Inclination: 93.83°
Azimuth: 270.1°
TVD: 7,037.9'
VS: 5,063.99'

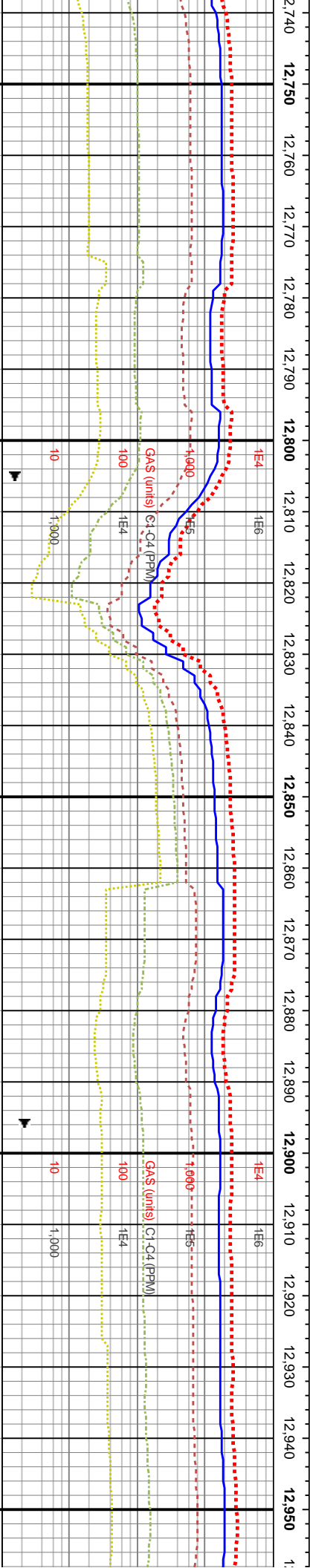
MD: 12,647'
Inclination: 93.15°
Azimuth: 270.18°
TVD: 7,032.18'
VS: 5,147.81'

MD: 12,680'
Inclination: 93.15°
Azimuth: 270.18°
TVD: 7,032.18'
VS: 5,147.81'



12560-12620 CHK (65%): pred med- dk dk gy, occ brn- sl blk, bf- med gy mot thru, sl hd, pred sb blk- blk, sl- mod arg, mod use euhed cal, calc incl, tr pyr: MRLST (35%): dk- med gy, sme sl blk, sb blk, sl frm- frm, mod- v arg, cal incl, tr frac fl cal	12620-12680 CHK (65%): pred med- dk dk gy, abnt gy- occ brn- sl blk, bf- med gy mot thru, pred frm- sl hd, pred sb blk- blk, sl- mod arg, mod use euhed cal, calc incl, tr pyr: MRLST (35%): dk- med gy, sme sl blk, sb blk, sl frm- frm, mod- v arg, cal incl, tr frac fl cal	12680-12740 CHK (80%): pred med- dk dk gy, abnt gy- occ brn- sl blk, bf- med gy mot thru, pred frm- sl hd, pred sb blk- blk, sl- mod arg, mod use euhed cal, calc incl, tr pyr: MRLST (20%): dk- med gy, sme sl blk, sb blk, sl frm- frm, mod- v arg, cal incl, tr frac fl cal
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2,742'
ation: 93.02°
uth: 269.55°
7,027.07'
242.67'

MD: 12,836'
Inclination: 93.46°
Azimuth: 269.35°
TVD: 7,021.75'
VS: 5,336.52'



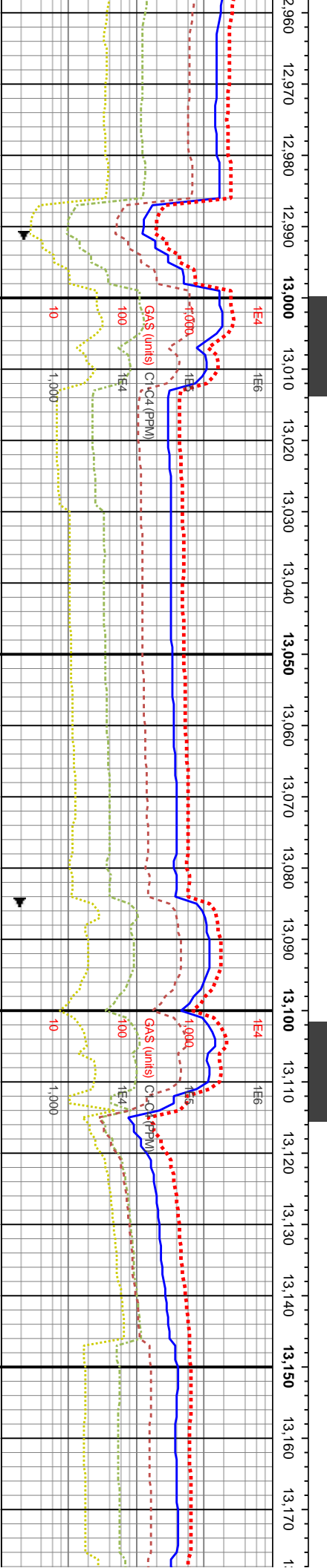
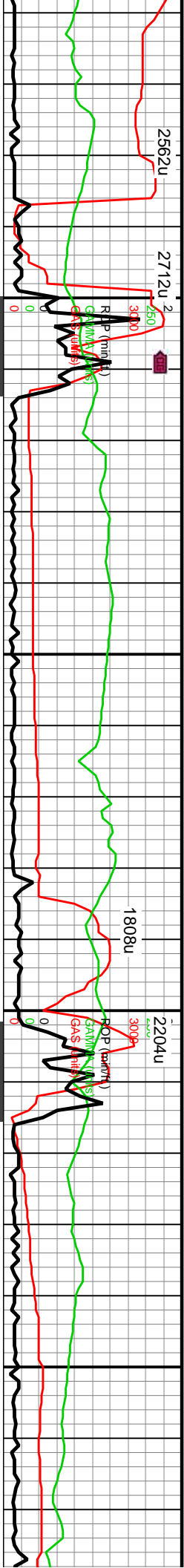
12740-12800 CHK (80%): pred med- sl dk gy, abnt gy, occ brn- sl blk, lt gy, bf- med gy mot thru, pred frm- sl hd, pred sb blk- blk, sl- mod arg, mod calc incl; MRLST (20%): dk- med gy, sme sl blk, sb blk, sl frm- frm, mod- v arg, cal incl, rr frac fl cal

12800-12860 CHK (90%): pred med- sl dk gy, abnt gy, occ brn- sl blk, lt gy, bf- med gy mot thru, pred frm- sl hd, pred sb blk- blk, sl- mod arg, mod calc incl; MRLST (10%): dk- med gy, sme sl blk, sb blk, sl frm- frm, mod- v arg, cal incl, rr frac fl cal

12860-12920 CHK (90%): pred med- gy, occ brn- sl blk, lt gy, bf- med gy mot thru, pred frm- sl hd, pred sb blk- blk, sl- mod arg, mod calc incl; MRLST (10%): dk- med gy, sme sl blk, sb blk, sl frm- frm, mod- v arg, cal incl, rr frac fl cal

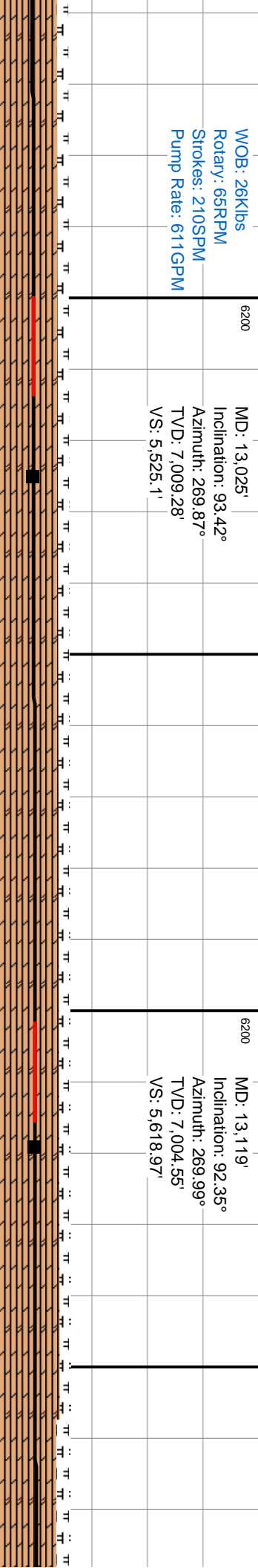
12920-12980 CHK (90%): pred med- gy, occ brn- sl blk, lt gy, bf- med gy mot thru, pred frm- sl hd, pred sb blk- blk, sl- mod arg, mod calc incl; MRLST (10%): dk- med gy, sme sl blk, sb blk, sl frm- frm, mod- v arg, cal incl, rr frac fl cal



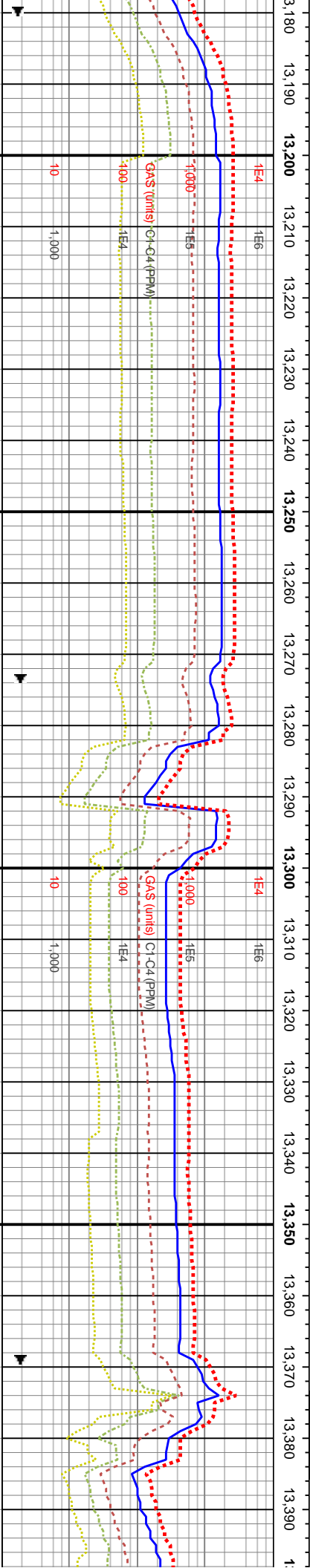
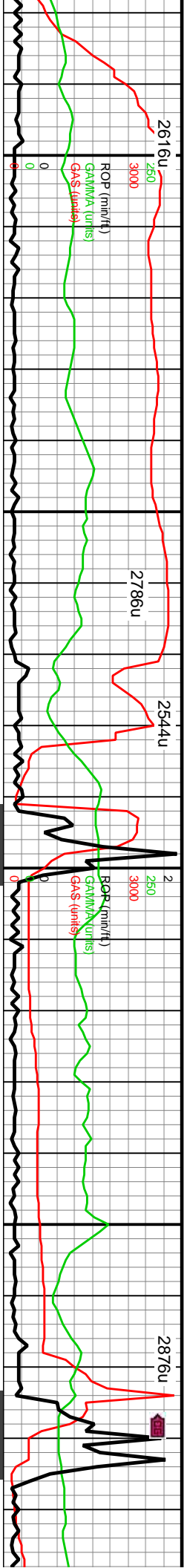


WOB: 26Klbs
Rotary: 65RPM
Strokes: 210SPM
Pump Rate: 611GPM

MD: 13,025'
Inclination: 93.42°
Azimuth: 269.87°
TVD: 7,009.28'
VS: 5,525.1'



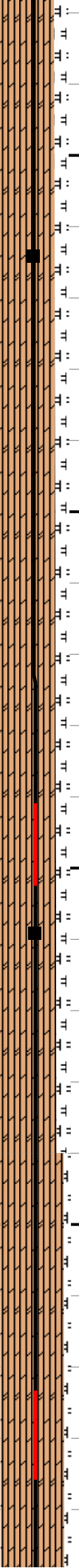
med- gy, occ brn- ru, pred frm- sl hd, gy, mod calc incl; me sl blk, sb blk, sl rr frac fl cal	12980-13040 CHK (90%): pred med- gy, mod brn- lt brn, lt gy, bf- med gy mot thru, pred frm- sl hd, pred sb blk- blk, sl- mod arg, mod calc incl; MRLST (10%): dk- med gy, sme sl blk, sb blk, sl frm- frm, mod- v arg, cal incl, rr frac fl cal	13040-13100 CHK (90%): pred med- gy, mod brn- lt brn, lt gy, bf- med gy mot thru, pred frm- sl hd, pred sb blk- blk, sl- mod arg, mod calc incl; MRLST (10%): dk- med gy, sme sl blk, sb blk, sl frm- frm, mod- v arg, cal incl, rr frac fl cal	13100-13160 CHK (90%): pred med- gy, mod brn- lt brn, lt gy, bf- med gy mot thru, pred frm- sl hd, pred sb blk- blk, sl- mod arg, mod calc incl; MRLST (10%): dk- med gy, sme sl blk, sb blk, sl frm- frm, mod- v arg, cal incl	13160-13220 CHK (90%): pred med- gy, mod brn- lt brn, lt gy, bf- med gy mot thru, pred frm- sl hd, pred sb blk- blk, sl- mod arg, mod calc incl; MRLST (10%): dk- med gy, sme sl blk, sb blk, sl frm- frm, mod- v arg, cal incl
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MD: 13,214'
Inclination: 92.78°
Azimuth: 270.76°
TVD: 7,000.29'
VS: 5,713.88'

MD: 13,309'
Inclination: 92.77°
Azimuth: 270.79°
TVD: 6,995.7'
VS: 5,808.76'

MD:
Inclir
Azim
TVD
VS: :



TVD (ft)

TVD (ft)

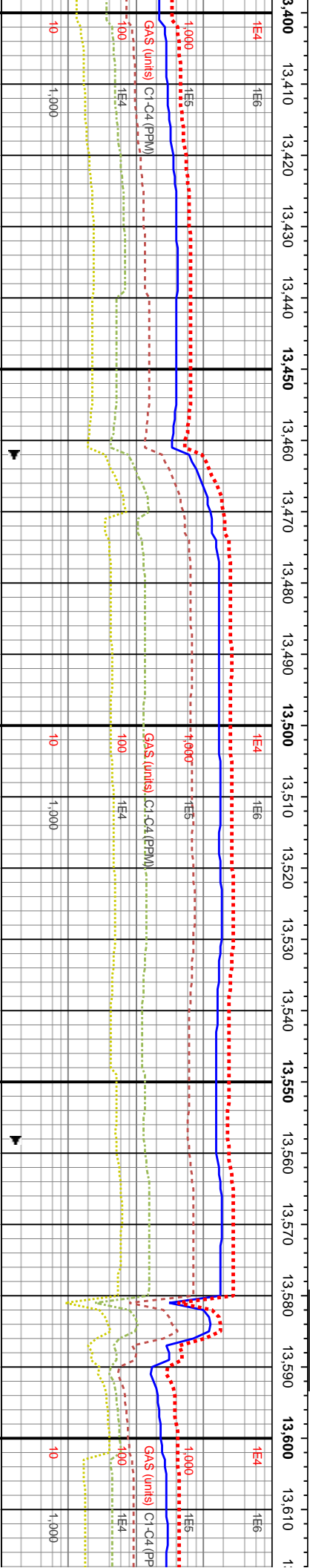
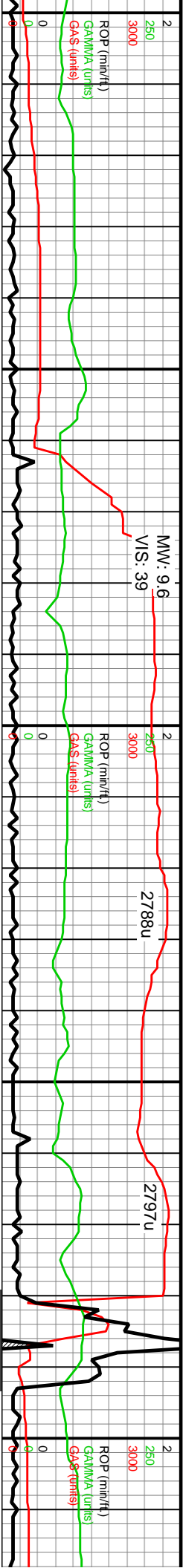
13220 CHK (80%): pred med- gy, mod
n, lt gy, bf- med gy mot thru, pred frm-
ed sb blk- blk, sl- mod arg, mod
MRLST (20%): dk- med gy, sme sl
blk, sl frm- frm, mod- v arg, cal incl-

13220-13280 CHK (80%): pred med- gy, mod
brn- lt brn, lt gy, bf- med gy mot thru, pred frm-
sl hd, pred sb blk- blk, sl- mod arg, mod
calc incl; MRLST (20%): dk- med gy, sme sl
blk, sb blk, sl frm- frm, mod- v arg, cal incl-

13280-13340 CHK (80%): pred med- gy,
mod brn- lt brn, lt gy, bf- med gy mot thru,
pred frm- sl hd, pred sb blk- blk, sl- mod
arg, mod calc incl; MRLST (20%): dk- med
gy, sme sl blk, sb blk, sl frm- frm, mod- v
arg, cal incl- lse cal

13340-13400 CHK (90%): pred med-
gy, mod brn- lt brn, lt gy, bf- med gy mo
thru, pred frm- sl hd, pred sb blk- blk,
sl- mod arg, mod calc incl; MRLST
(10%): dk- med gy, sme sl blk, sb blk,
sl frm- frm, mod- v arg, cal incl- lse cal,
sme obn sin



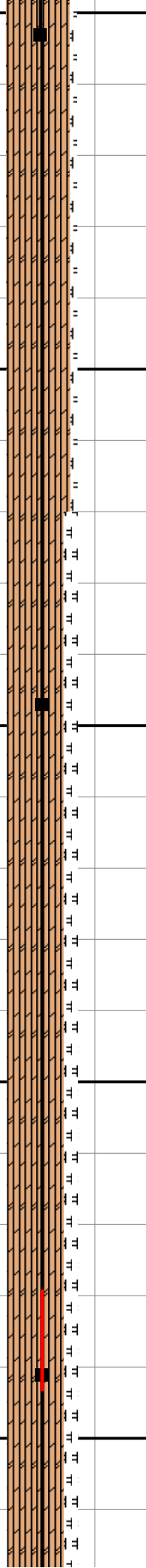


13,403'
Rotation: 91.34°
Azimuth: 270.13°
6,992.32'
5,902.7'

MOB: 49Klbs
Rotary: 65RPM
Strokes: 210SPM
Pump Rate: 611GPM

MD: 13,497' 6200
Inclination: 91.68°
Azimuth: 271.31°
TVD: 6,989.85'
VS: 5,996.66'

MD: 13,591' 6200
Inclination: 90.17°
Azimuth: 271.37°
TVD: 6,988.33'
VS: 6,090.62'



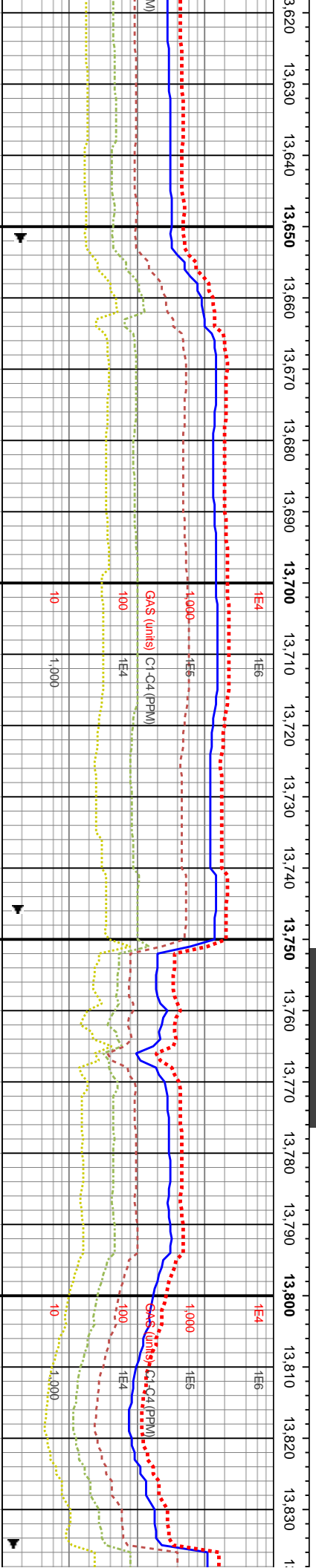
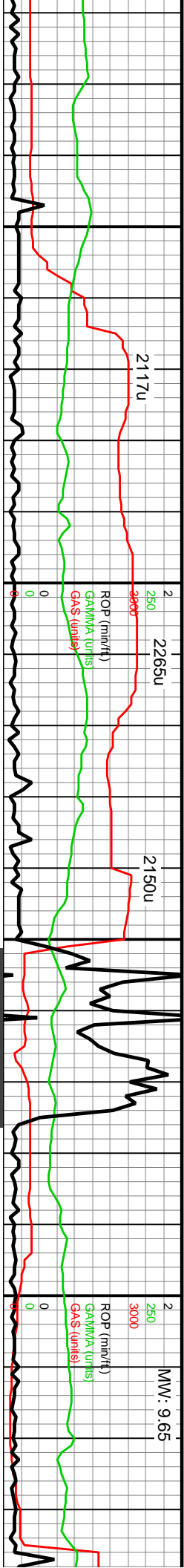
13400-13460 CHK (90%): pred med- gy, mod brn- lt brn, lt gy, bf- offwht gy mot thru, pred frm- sl hd, pred sb blk- blk, sl- mod arg, mod calc incl, MRLST (10%): dk- med gy, sme sl blk, sb blk, sl frm- frm, mod- v arg, cal incl- lse cal, sme obn stn

13460-13520 CHK (80%): pred med- dk gy, abnt gy, occ brn- sl blk, bf- med gy mot thru, pred frm- sl hd, pred sb blk- blk, sl- mod arg, tr lse euhed cal, calc incl, tr pyr: MRLST (20%): dk- med gy, sme sl blk, sb blk, sl frm- frm, mod- v arg, cal incl, tr frac fl cal

13520-13580 CHK (80%): pred med- dk gy, abnt gy- occ brn- sl blk, bf- med gy mot thru, pred frm- sl hd, pred sb blk- blk, sl- mod arg, tr lse euhed cal, calc incl, tr pyr: MRLST (20%): dk- med gy, sme sl blk, sb blk, sl frm- frm, mod- v arg, cal incl, tr frac fl cal

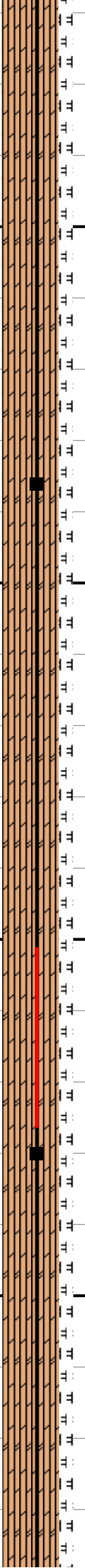
13580-13640 CHK (80%): p abnt gy, occ brn- sl blk, bf- r pred frm- sl hd, pred sb blk, tr lse euhed cal, calc incl, tr dk- med gy, sme sl blk, sb t mod- v arg, cal incl, tr frac fl





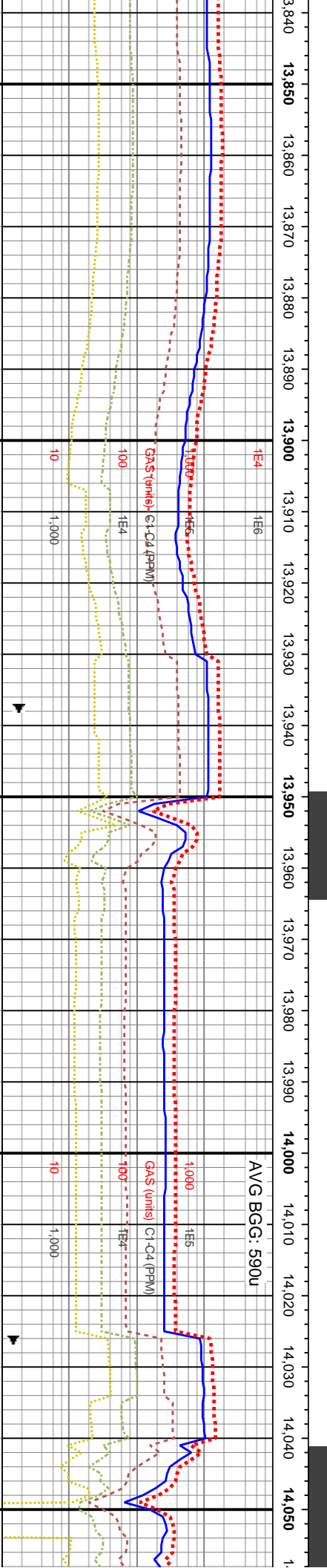
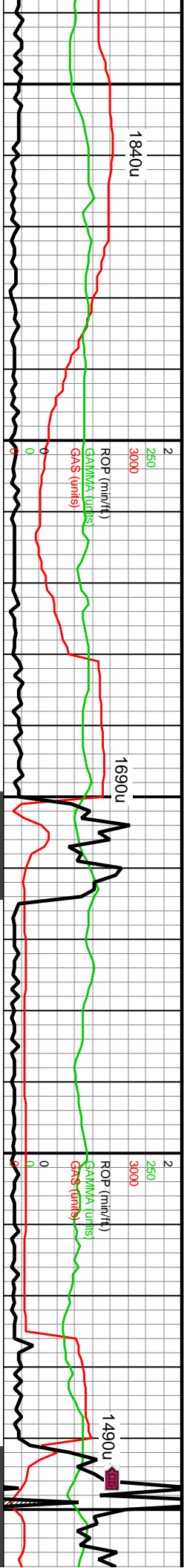
MD: 13,686'
Inclination: 89.26°
Azimuth: 271.94°
TVD: 6,988.8'
VS: 6,185.59'

MD: 13,780'
Inclination: 90.47°
Azimuth: 271.45°
TVD: 6,989.02'
VS: 6,279.55'



red med- dk gy, med gy mot thru, pred fr- sl mod arg, pyr: MRLST (20%): dk- med gy, sme sl blk, sb blk, sl frm- frm, mod- v arg, cal incl, tr frac fl cal, tr pyr	13640-13700 CHK (80%): pred med- dk gy, abt gy, occ brn- sl blk, bf- med gy mot thru, pred fr- sl hd, pred sb blk- blk, sl- mod arg, tr lse euhed cal, calc incl, tr pyr: MRLST (20%): dk- med gy, sme sl blk, sb blk, sl frm- frm, mod- v arg, cal incl, tr frac fl cal, tr pyr	13700-13760 CHK (80%): pred med- dk gy, abt gy, occ brn- sl blk, bf- med gy mot thru, pred fr- sl hd, pred sb blk- blk, sl- mod arg, tr lse euhed cal, calc incl, tr pyr: MRLST (20%): dk- med gy, sme sl blk, sb blk, sl frm- frm, mod- v arg, cal incl, tr frac fl cal, tr pyr	13760-13820 CHK (75%): pred med- dk gy, abt gy, occ brn- sl blk, bf- med gy mot thru, pred fr- sl hd, pred sb blk- blk, sl- mod arg, tr lse euhed cal, calc incl, tr pyr: MRLST (25%): dk- med gy, sme sl blk, sb blk, sl frm- frm, mod- v arg, cal incl, tr frac fl cal, tr pyr	13820- occ brn sl hd, f euhed med gy arg, ca
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MD: 13,874'
Inclination: 91.54°
Azimuth: 271.83°
TVD: 6,987.38'
VS: 6,373.5'

TVD (ft)

MD: 13,969'
Inclination: 90.2°
Azimuth: 271.01°
TVD: 6,985.93'
VS: 6,468.46'

TVD (ft)

WOB: 41Klbs
Rotary: 65RPM
Strokes: 214SPM
Pump Rate: 621GPM

MD
Incl
Azi
TVI
VS

13880-13940 CHK (75%): pred medgy- gy,

-sl blk, bf- med gy mot thru, pred frm-
red sb blk- blk, sl- mod arg, sme lse
calc incl, tr pyr: MRLST (25%): dk-
v, sme sl blk, sb blk, sl frm- hd, mod- v
incl, tr frac fl cal, tr pyr

13880-13940 CHK (75%): pred medgy- gy,

occ brn- sl blk, bf- med gy mot thru, pred frm-
sl hd, pred sb blk- blk, sl- mod arg, sme lse
euhed cal, calc incl, tr pyr: MRLST (25%): dk-
med gy, sme sl blk, sb blk, sl frm- hd, mod- v
arg, cal incl, tr frac fl cal, tr pyr

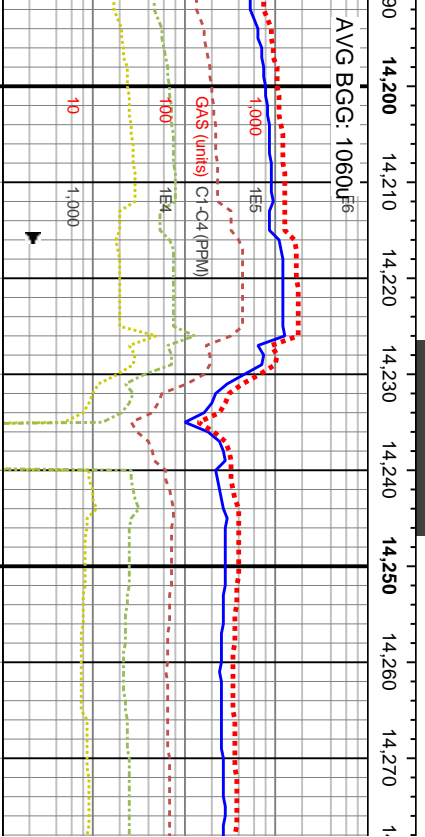
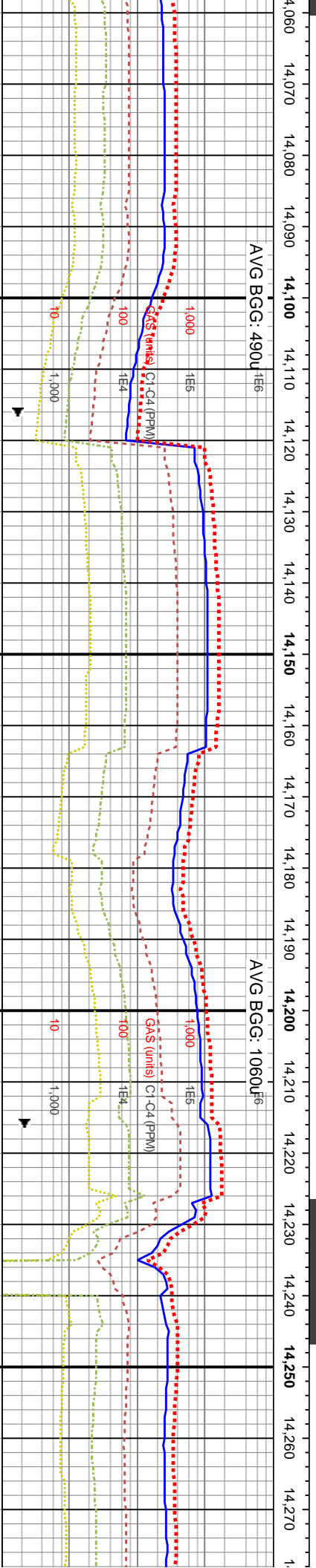
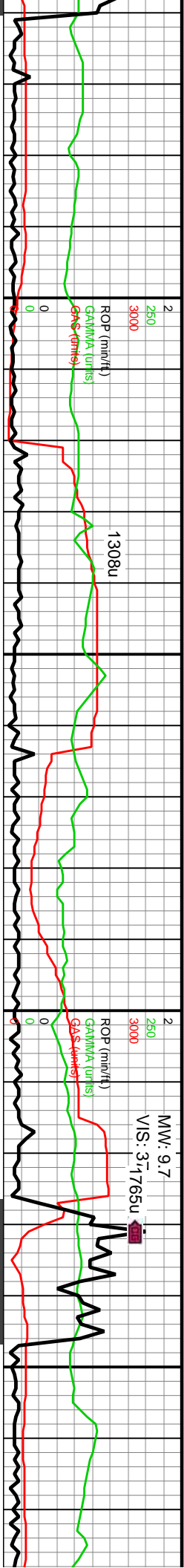
13940-14000 CHK (75%): pred medgy- gy,

occ brn- sl blk, bf- med gy mot thru, pred frm-
sl hd, pred sb blk- blk, sl- mod arg, sme lse
euhed cal, calc incl, tr pyr: MRLST (25%): dk-
med gy, sme sl blk, sb blk, sl frm- hd, mod- v
arg, cal incl, tr frac fl cal, tr pyr

14000-14060 CHK (75%): pred medgy- gy,

occ brn- sl blk, bf- med gy mot thru, pred frm-
sl hd, pred sb blk- blk, sl- mod arg, sme lse
euhed cal, calc incl, tr pyr: MRLST (25%): dk-
med gy, sme sl blk, sb blk, sl frm- hd, mod- v
arg, cal incl, tr frac fl cal, tr pyr

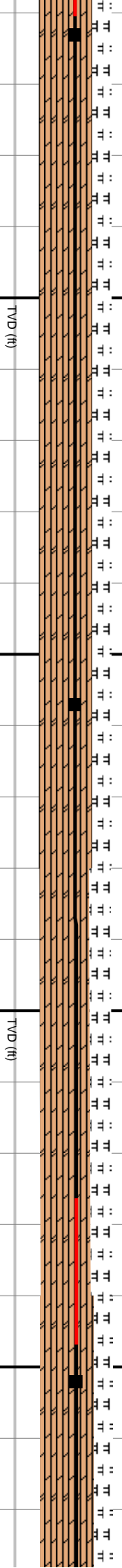




MD: 14,063'
Inclination: 90.9°
Azimuth: 271.15°
TVD: 6,984.99'
VS: 6,562.31'

MD: 14,157'
Inclination: 91.51°
Azimuth: 271.52°
TVD: 6,983.01'
VS: 6,656.26'

MD: 14,252'
Inclination: 92.05°
Azimuth: 268.61°
TVD: 6,980.07'
VS: 6,751.21'



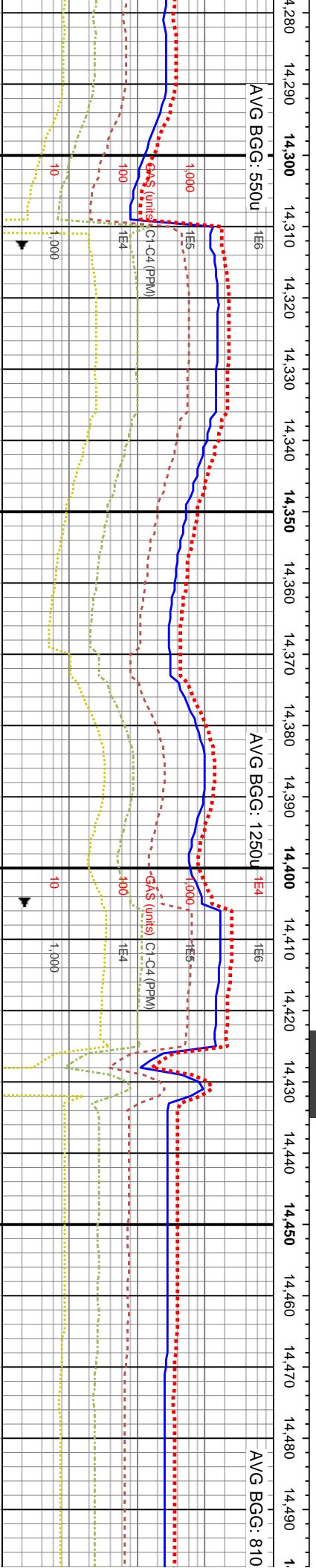
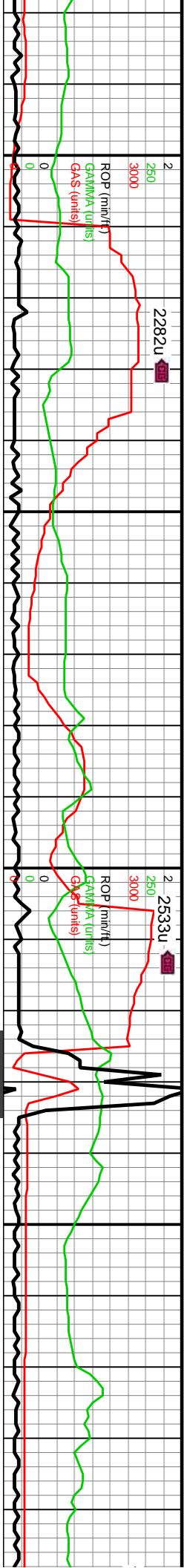
14060-14120 CHK (75%): pred medgy-gy, occ brn-si blk, bf-med gy mot thru, pred frm-si hd, pred sb blk-y-bkly, sl-mod arg, sme lse euhed cal, calc incl, tr pyr; MRLST (25%): dk-med gy, sme si blk, sb blk-y, sl frm-hd, mod-v arg, cal incl, tr frac fl cal, tr pyr₈₂₀₀

14120-14180 CHK (75%): pred medgy-gy, occ brn-si blk, bf-med gy mot thru, pred frm-si hd, pred sb blk-y-bkly, sl-mod arg, sme lse euhed cal, calc incl, tr pyr; MRLST (25%): dk-gy, sme si blk, sb blk-y, sl frm-hd, mod-v arg, cal incl, tr frac fl cal

14180-14240 CHK (70%): pred gy, occ lt gy, v arg LS wi com f-u f along chky incl, frm-brt l-mod fls sb rd-sb blk-y-sb ply ctgs, stly-gt tex ip, rr c free chk, rr bent, tr cal, tr vf pyr strg, hi calc wi cin HCL rxn, grdg to MRLST (30%): gy-dk gy, l-med hi fls sb rd-bkly-sb ply ctgs, mot wi brn mrlly incl & occ chky incl, l-mod calc wi brn mrlly resd₈₂₀₀

14240-14300 CHK (75%): pred gy, wi com f-u f along chky incl, frm-brt l-mod fls sb rd-sb blk-y-sb ply ctgs, stly-gt tex ip, rr c f cal, tr vf pyr strg, hi calc wi cin HCL MRLST (25%): gy-dk gy, l-med hi fls sb rd-bkly-sb ply ctgs, mot wi brn mrlly incl & occ chky incl, l-mod calc wi brn mrlly resd

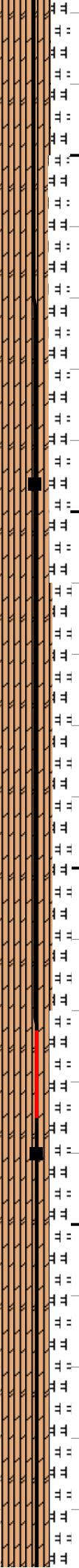




MD: 14,346'
Incination: 93.25°
Azimuth: 268.69°
TVD: 6,975.72'
VS: 6,845.07'

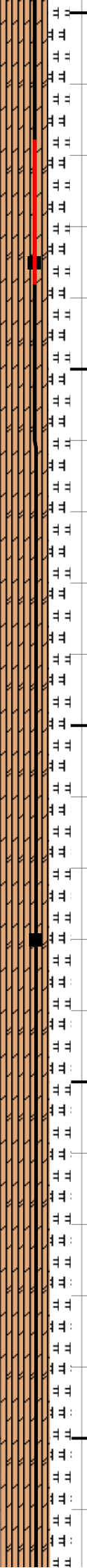
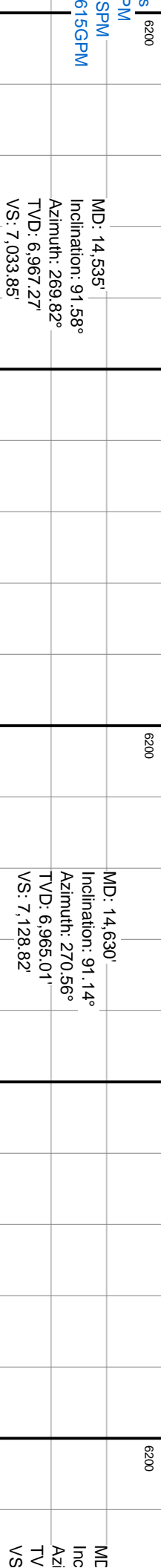
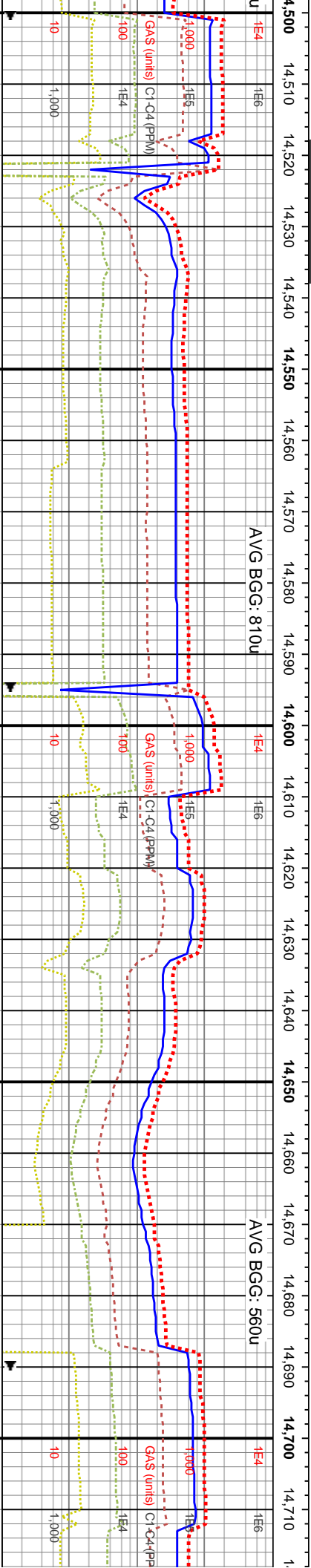
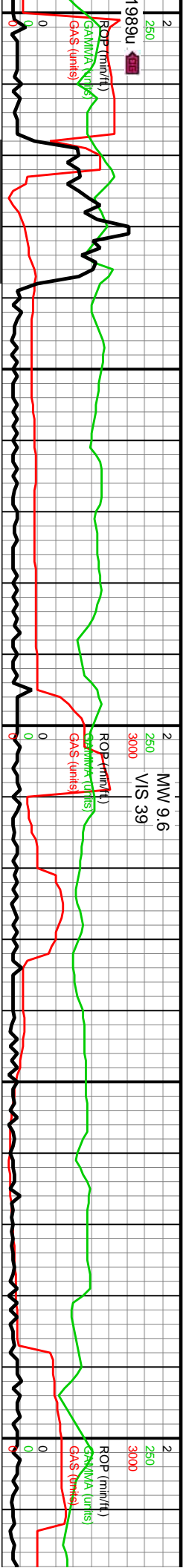
MD: 14,440'
Incination: 92.72°
Azimuth: 269.16°
TVD: 6,970.82'
VS: 6,938.92'

WOB: 40Klb
Rotary: 65RR
Strokes: 212
Pump Rate:



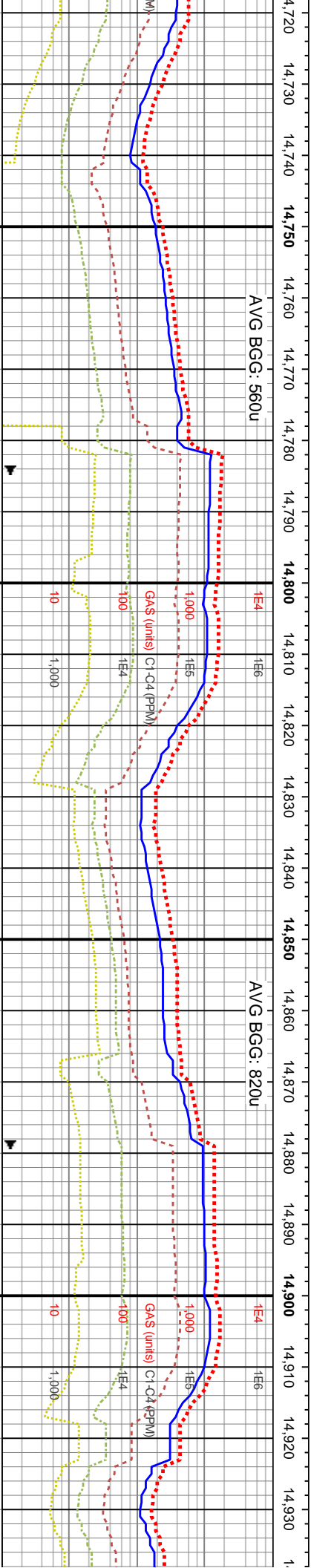
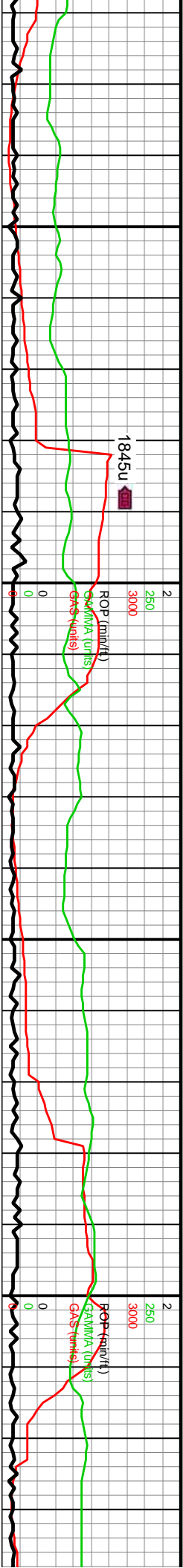
occ lt gy, v arg LS l-mod fis sb rd-sb free chk, r bent, tr rxn, grdg to s sb rd-biky-sb ply y incl, l-mod calc	14300-14360 CHK (70%): lt gy-gy v arg LS, frm-brit l-med hi fis sb rd-sb biky-sb ply ctgs, ply ip, slty-gt tex ip, com f-u f elong chky incl, r c free chk, r bent, tr cal, tr vf pyr strg, hi calc wi cin HCL rxn, grdg to MRLST (30%): gy-dk gy, l-med hi fis sb rd-biky-sb ply ctgs, mot wi brn mrlly incl & occ chky incl, l-mod calc wi brn mrlly resd	14360-14420 CHK (75%): lt gy-gy v arg LS, frm-brit l-med hi fis sb rd-sb biky-sb ply ctgs, ply ip, slty-gt tex ip, com f-u f elong chky incl, r c free chk, r bent, tr cal, tr vf pyr strg, hi calc wi cin HCL rxn, MRLST (25%): gy-dk gy, l-med hi fis sb rd-biky-sb ply ctgs, mot wi brn mrlly incl & occ chky incl, l-mod calc wi brn mrlly resd	14420-14480 CHK (70%): pred gy-lt gy, frm-brit l-med fis sb rd-sb biky-sb ply ctgs, slty-gt tex ip, occ vf-f chky incl & thn chky lamm ip, tr c free chk, tr vf pyr, hi calc wi cin HCL rxn, MRLST (30%): gy-dk gy mot wi brn mrlly incl & occ chky incl, l-med hi fis sb rd-biky-sb ply ctgs, l-mod calc wi brn mrlly resd	14480-14540 CI l-med hi fis sb rd-sb free chk, r bent, tr rxn, grdg to s sb rd-biky-sb ply y incl, l-mod calc
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SPM 615GPM	MD: 14.535' Inclination: 91.58° Azimuth: 269.82° TVD: 6,967.27' VS: 7.033.85'	14540-14600 CHK (70%): pred gy-It gy, frm-brit l-mod fis sb rd-sb biky-sb ply ctgs, slty-gt tex ip, occ vf-f chky incl & thn chky lamm ip, tr c free chk, tr vf pyr, hi calc wi cin HCL rxn, MRLST (30%): gy-dk gy mot wi brn mrlly incl & occ chky incl, l-med hi fis sb rd-biky-sb ply ctgs, l-mod calc wi brn mrlly resdl	14600-14660 CHK (70%): gy-It gy v arg LS, frm-brit l-med hi fis sb rd-sb biky-sb ply ctgs, ply ip, sm-slty tex, occ f-u f chky incl, along chky incl ip, tr c free chk, tr vf pyr, hi calc wi cin HCL rxn, MRLST (30%): gy-dk gy, l-med hi fis sb rd-biky-sb ply ctgs, mot wi brn mrlly incl & occ chky incl, l-mod calc wi brn mrlly resdl	14660-14720 CHK (70%): pred lt gy, occ gy, frm-brit mod fis sb ang-sb biky ctgs, v arg LS wi com f chky incl & thn chky lamm, slty tex, rr c free chk, tr vf pyr, hi calc wi cin HCL rxn, MRLST (30%): gy-dk gy, mot wi brn mrlly incl & occ f chky incl, med hi fis sb biky-sb ply ctgs, l-mod calc wi brn mrlly resdl
8200			8200	8200





14,724'
Inclination: 90.6°
Muth: 269.56°
D: 6.963.58'
: 7.222.81'

MD: 14,819'
Inclination: 91.48°
Azimuth: 270.63°
TVD: 6.961.86'
VS: 7.317.79'

MD: 14,913'
Inclination: 89.36°
Azimuth: 269.34°
TVD: 6.961.17'
VS: 7.411.78'



14720-14780 CHK (80%): It gy-gy v arg LS wi com
vf-f chky incl & thn chky lamn, frm-brit mod fis sb
ang-sb blkly ctgs, sm-sily tex, rr-occ c free chk, tr vf
pyr, tr fos frags, hi calc wi cin HCL rxn, MRLST
(30%): gy-dk gy, l-med hi fis sb rd-blky-sb ply ctgs,
mot wi brn mrlly incl & occ chky incl, l-mod calc wi
brn mrlly resd

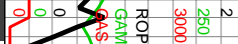
14780-14840 CHK (80%): It gy-gy v arg LS wi com vf-f
chky incl & thn chky lamn, frm-brit mod fis sb ang-sb
blkly ctgs, sm-sily tex, rr-occ c free chk, tr vf pyr, tr fos
frags, hi calc wi cin HCL rxn, MRLST (30%): gy-dk gy,
l-med hi fis sb rd-blky-sb ply ctgs, mot wi brn mrlly
incl & occ vf-f chky incl, l-mod calc wi brn mrlly resd

14840-14900 CHK (80%): pred It gy, occ gy, frm-brit
mod fis sb ang-sb blkly ctgs, v arg LS wi com f chky
incl & thn chky lamn, sily tex, rr c free chk, tr vf pyr, hi
calc wi cin HCL rxn, MRLST (20%): gy-dk gy, mot wi
brn mrlly incl & occ f chky incl, med hi fis sb blkly-sb
ply ctgs, l-mod calc wi brn mrlly resd

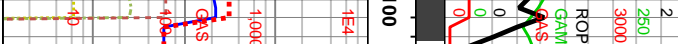
14900-15020 CHK (80%): It gy-gy
ang-sb blkly ctgs, sm-sily tex, rr-
gy-dk gy, l-med hi fis sb rd-blky-sb
resd



2	
250	
3000	



2	
250	
3000	
ROP	
GAM	



AVG BGG: 1050u

AVG BGG: 3600

002

MD: 15.007

Inclination: 88.56°

Azimuth: 271.64°

—TVD: 6,962.88

VS: 7,505.76"

102

tion: 90.67%

h: 271.14°

963.5

500.73'

TV_D (ft)

15020-15080 CHK (80%): It gy-gy v arg LS wi com vf-
chky incl & thn chky larnn, frm-brit mod fis sb ang-sb

15020-15080 CHK (80%): tt gy-gy v arg LS wi com vt-f-
chky incl & thn chky lamn, frm-brit mod fis sb ang-sb
biky cigs, sm-sltv tex, rr-occ c free chk, tr vf pyr, t fos
frags, hi calc wi dthn HCL pxn, MRLST (30%): gy-dk gy,
mot hi fis sb wd biky-sb chky, cmt wi bsn mply

incl & occ vf-f chky incl, l-mod calc wi brn mrly resdi

[illegible]

15140-15260 C

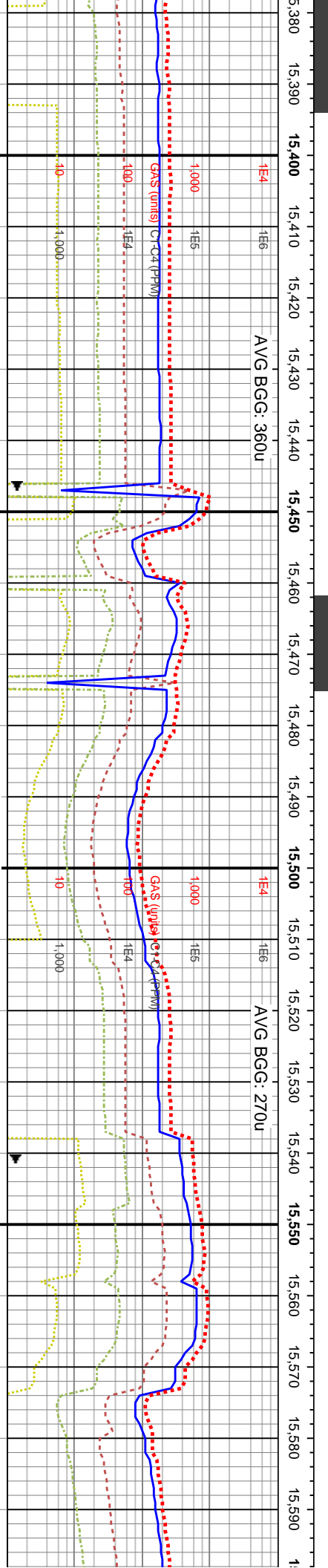
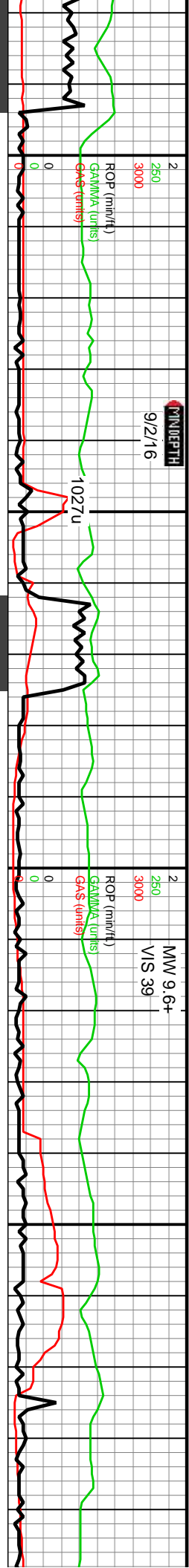
10140 10200
& thn chky lam

HCL rxn. MRLS

calc wi brn mrls

—



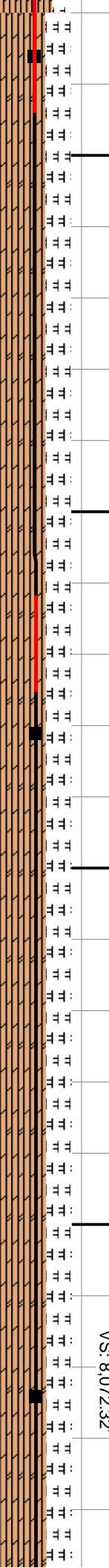


ID: 15,386'
Inclination: 89.2°
Azimuth: 267.62°
VD: 6,967.22'
S: 7,884.65'

MD: 15,481'
Inclination: 91.71°
Azimuth: 266.77°
TVD: 6,966.47'
VS: 7,979.51'

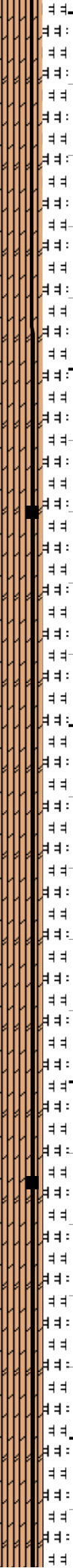
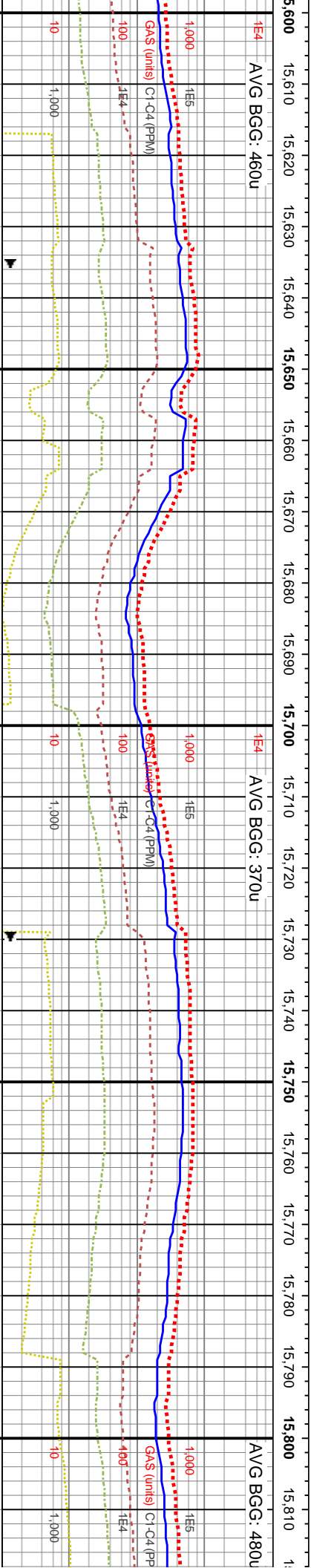
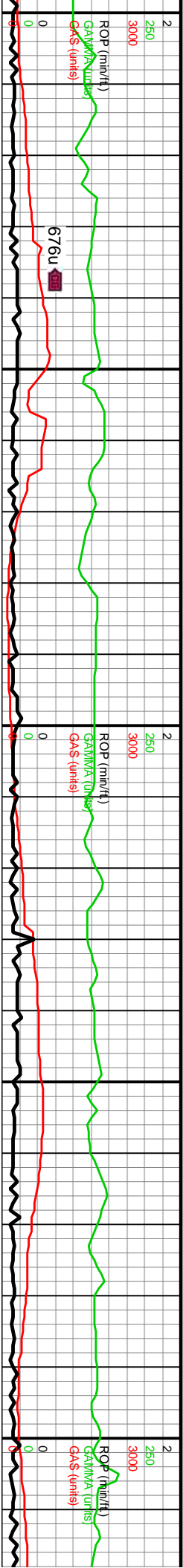
WOB: 42Klbs, '00
Rotary: 68RPM
Strokes: 202SPM
Pump Rate: 587GPM

MD: 15,574'
Inclination: 91.68°
Azimuth: 266.93°
TVD: 6,963.72'
VS: 8,072.32'



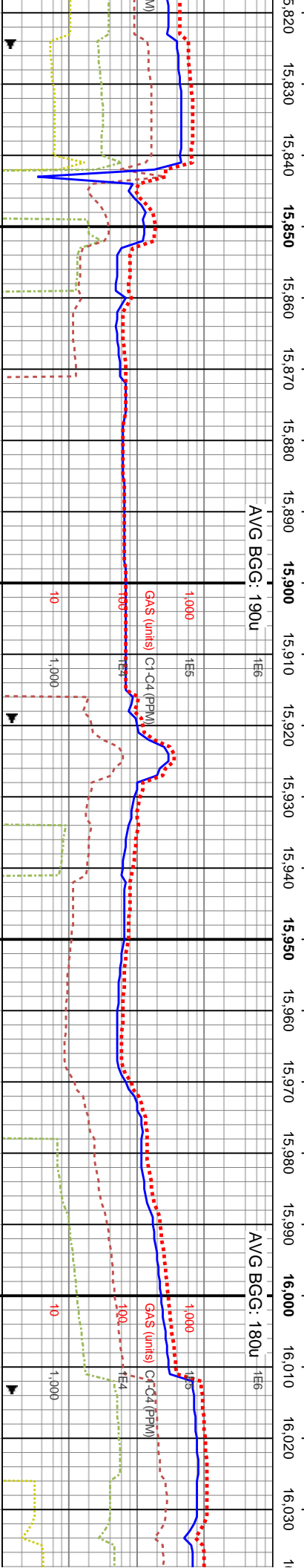
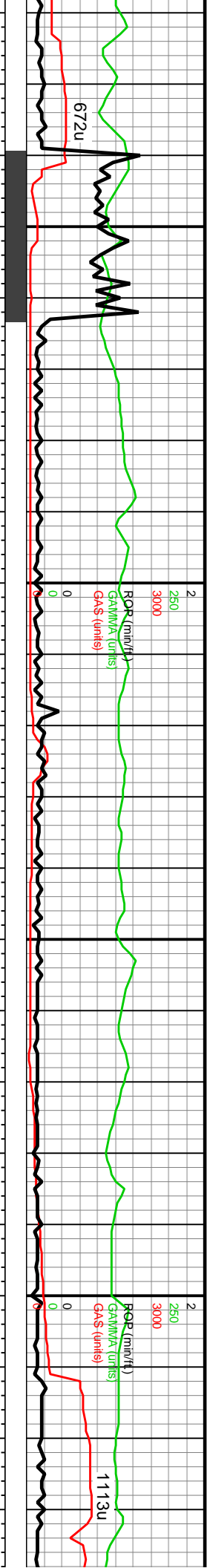
15380-15500 CHK (65%): lt gy-gy-dk gy-gy brn ip, v arg LS wi com vf-f chky incl & thn chky lamm-elong incl, frm-brit mod fis sb ang-sb blk cyg, sm-sily tex, rr-occ c free chk, tr vf pyr & pyr strg, hi calc wi dln HCL rxn, MRLST (35%): gy-dk gy mot wi brn mrlly incl, l-med hi fis sb rd-blky-sb ply cygs, occ vf-f chky incl ip, l-mod calc wi brn mrlly resd	8200
15500-15620 CHK (65%): lt gy-gy-gy brn-dk gy, occ gy, frm-brit mod fis sb ang-sb blk cy ct, com f chky incl & thn chky lamm, sily tex, rr-occ c free chk, tr vf pyr & pyr strg, tr bent, hi c rxn, MRLST (35%): gy-dk gy-gy brn, mot wi brn mrlly incl & occ f chky incl, med hi fis sb b l-mod calc wi brn mrlly resd	8200





15620-15680 CHK (65%): lt gy-gy-dk gy-gy brn ip, v arg LS wi com vf-f chky incl & thn chky lamn-elong incl, frm-brit l-mod fis sb rd-sb ang-sb blkly ctgs, sm-sily tex, rr-occ c free chk, tr vf pyr & pyr strg, tr acic fos frags, hi calc wi cln HCL rxn, MRLST (35%): gy-dk gy mot wi brn mrly incl, l-med hi fis sb rd-blky-sb ply ctgs, occ vf-f chky incl ip, l-mod calc wi brn mrly resd	15680-15740 CHK (65%): lt gy-gy-gy brn-dk gy, occ gy, frm-brit mod fis sb ang-sb blkly ctgs, v arg LS wi com f chky incl & thn chky lamn, sily tex, rr-occ c free chk, tr vf pyr & pyr strg, tr acic fos frags, hi calc wi cln HCL rxn, MRLST (35%): gy-dk gy-gy brn, mot wi brn mrly incl & occ f chky incl, med hi fis sb blkly-sb ply ctgs, l-mod calc wi brn mrly resd	15740-15800 CHK (65%): lt gy-gy-dk gy-gy brn ip, v arg LS wi com vf-f chky incl & thn chky lamn-elong incl, frm-brit l-mod fis sb rd-sb ang-sb blkly ctgs, sm-sily tex, rr-occ c free chk, tr vf pyr & pyr strg, tr acic fos frags, hi calc wi cln HCL rxn, MRLST (35%): gy-dk gy mot wi brn mrly incl, l-med hi fis sb rd-blky-sb ply ctgs, occ vf-f chky incl ip, l-mod calc wi brn mrly resd	15800-15860 C gy, frm-brit moc com f chky incl chk, tr vf pyr & l HCL rxn, MRLS mrly incl & occ: ctgs, l-mod calc
8200	8200	8200	8200

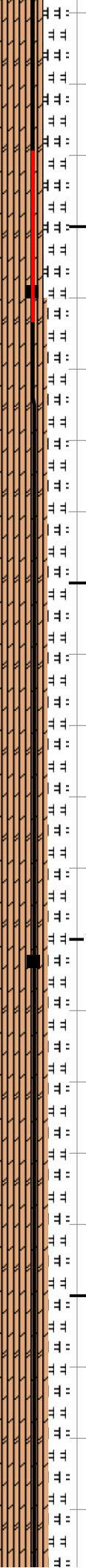




MD: 15,859'
Inclination: 91.74°
Azimuth: 268.74°
TVD: 6,956.87'
VS: 8,356.76'

MD: 15,953'
Inclination: 91.58°
Azimuth: 269.56°
TVD: 6,954.15'
VS: 8,450.7'

WOB: 47Klbs
Rotary: 66RPM
Strokes: 200SPM
Pump Rate: 581 GPM



TVD (ft)

TVD (ft)

HK (65%): lt gy-gy-gy brn-dk gy, occ
fis sb ang-sb blkly ctgs, v arg LS wi
& thn chkylam, silty tex, rr-occ c free
pyr strng, tr acic fos frags, hi calc wi cln
T (35%): gy-dk gy-gy brn, mot wi brn
chkyl incl, med hi fis sb blkly-sb plty
wi brn mrlly resd

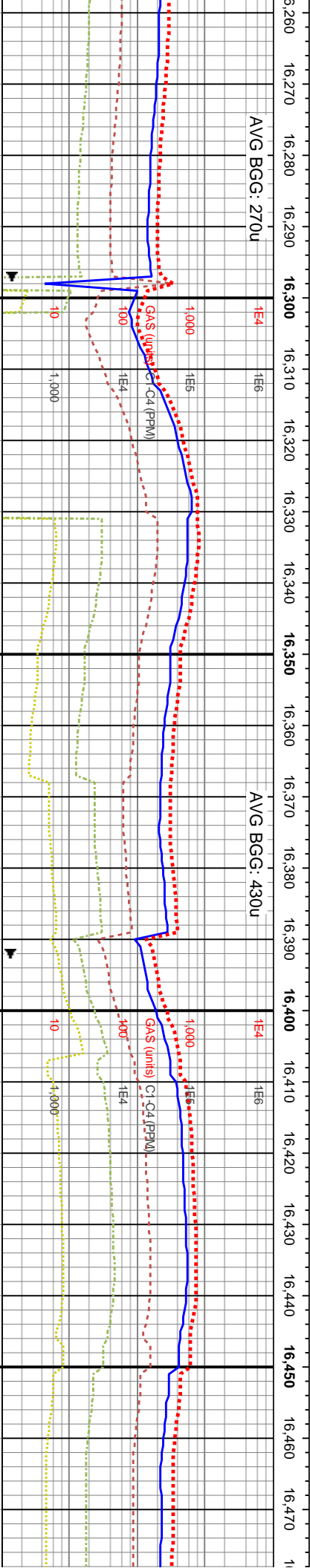
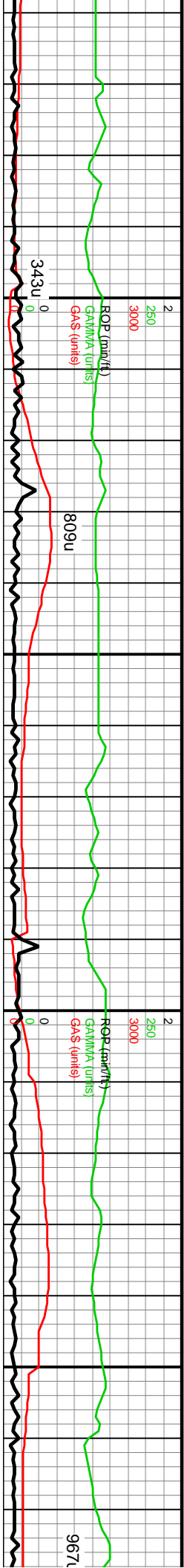
15860-15980 CHK (70%): lt gy-gy-dk gy-gy brn ip, v arg LS wi com vf-f chkyl incl & thn chkylam-elong
incl, frm-brt l-mod fis sb rd-sb ang-sb blkly ctgs, sm-silty tex, rr-occ c free chk, tr vf pyr & pyr strng, tr acic
fos frags, hi calc wi cln HCL rxn, MRLST (30%): gy-dk gy, l-med hi fis sb rd-blkly-sb plty ctgs, mot wi brn
mrlly incl, occ vf-f chkyl incl ip, l-mod calc wi brn mrlly resd

15980-16040 CHK (70%): lt gy-gy-gy brn-dk gy, occ
gy, frm-brt mod fis sb ang-sb blkly ctgs, v arg LS wi
com f chkyl incl & thn chkylam, silty tex, rr-occ c free
chk, tr vf pyr & pyr strng, tr acic fos frags, hi calc wi cln
HCL rxn, MRLST (30%): gy-dk gy-gy brn, mot wi brn
mrlly incl & occ f chkyl incl, med hi fis sb blkly-sb plty
ctgs, l-mod calc wi brn mrlly resd

8200

8200

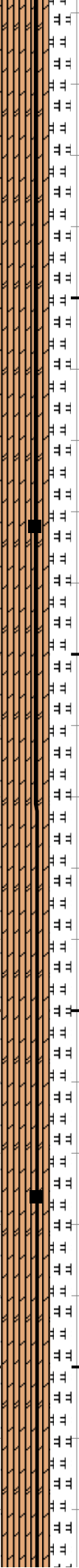




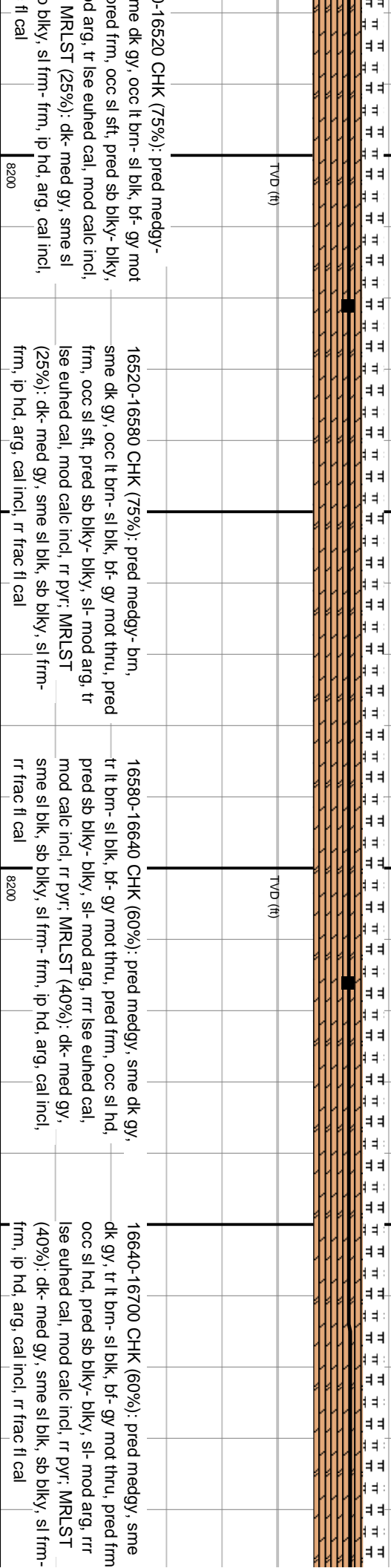
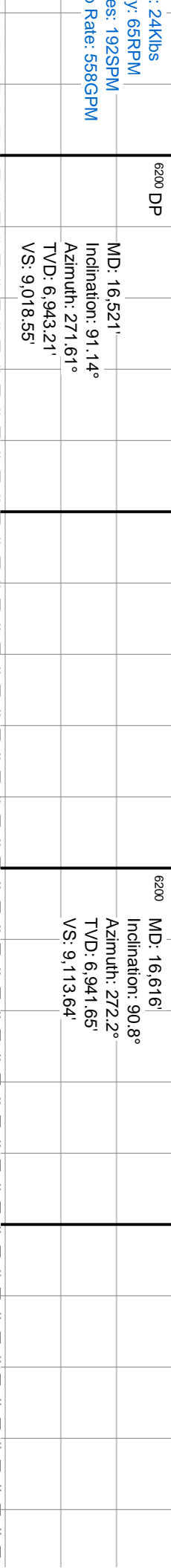
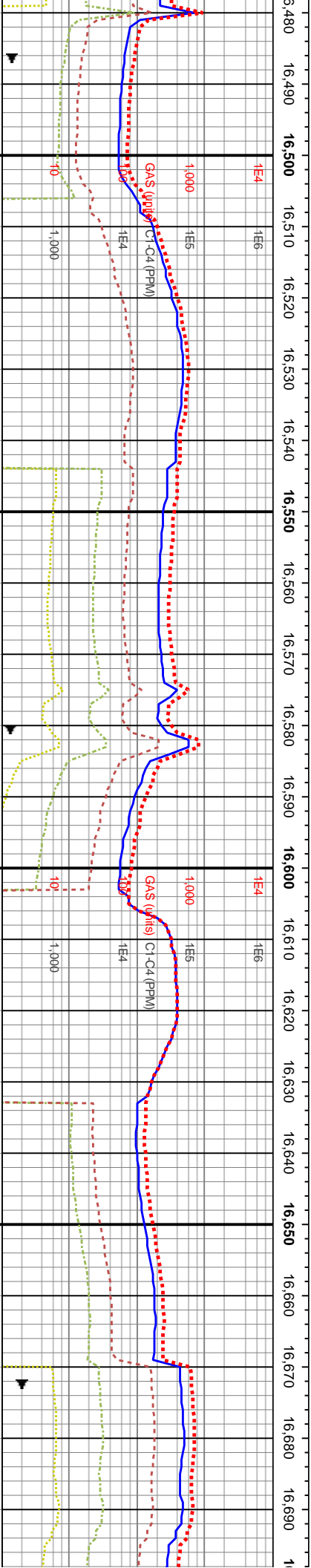
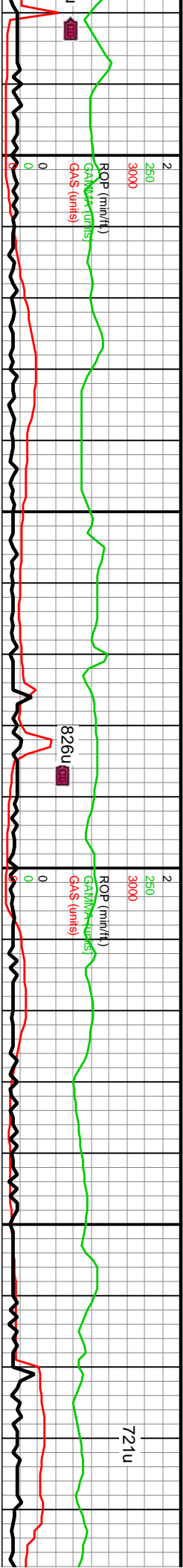
MD: 16,332'
Inclination: 90.8°
Azimuth: 270.79°
TVD: 6,946.86'
VS: 8,829.62'

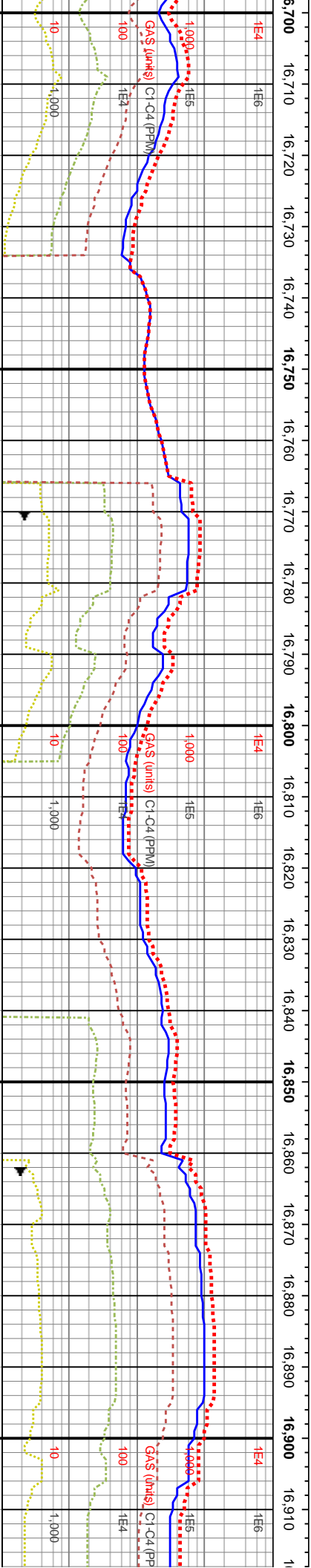
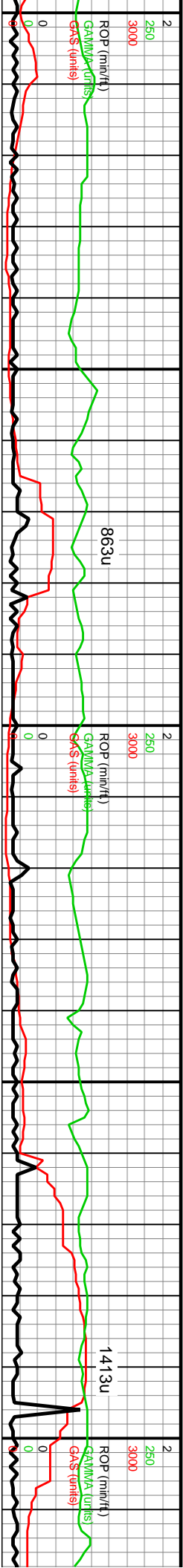
MD: 16,426'
Inclination: 91.24°
Azimuth: 271.13°
TVD: 6,945.18'
VS: 8,923.6'

WOB
Rotar
Strok
Pump



16280-16340 CHK (70%): lt gy-gy brn-dk gy, frm-brit l-hi fis sb rd-sb blk-pty ctgs, v arg LS wi com f chky incl & thn chky lamm, rr c free chk thru, slty tex, tr vf ch, frm-brit l-mod fis sb rd-sb ang-sb blk cyctgs, sm-slty tex, tr vf pyr & c pyr strg, hi calc wi cin HCL rxn, MRLST (30%): gy-dk gy-gy brn, mot wi brn mrlly incl & occ f chky incl, rd-blky-sb ply ctgs, mot wi brn mrlly incl, occ vf-f chky incl ip, l-mod calc wi brn mrlly resd		8200	8200
16340-16400 CHK (70%): lt gy-gy-dk gy-gy brn ip, v arg LS wi com vf-f chky incl & thn chky lamm, rr c free dk gy, occ lt brn-sl blk, bf-gy mot thru, pred frm, occ sl sft, pred sb blk- blk, sl-mod arg, tr lse euhed cal, mod calc incl, rr pyr, MRLST (25%): dk-med gy, sme sl blk, sb blk, sl frm- frm, ip hd, arg, cal incl, rr frac fl cal		8200	8200
16400-16460 CHK (75%): pred medgy-brn, sme brn, s thru, f sl-mc rr pyr, blk, sl, rr frac		8200	8200

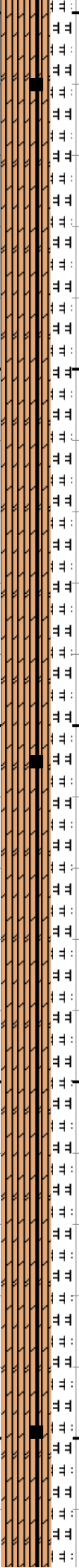




MD: 16,710'
Inclination: 90.67°
Azimuth: 271.91°
TVD: 6,940.44'
VS: 9,207.58'

MD: 16,805'
Inclination: 90.27°
Azimuth: 271.87°
TVD: 6,939.66'
VS: 9,302.53'

MD: 16,899.200'
Inclination: 90.34°
Azimuth: 272.45°
TVD: 6,939.16'
VS: 9,396.47'



16700-16760 CHK (60%): pred medgy, sme dk gy, tr lt brn-si blk, bf-gy mot thru, pred frm, occ si hd, pred sb blk-y-biky, si-mod arg, rrr lse euhed cal, mod calc incl, rr pyr, MRLST (40%): dk-med gy, sme si blk, sb blk-y, si frm-frm, ip hd, arg, cal incl, rr frac fl cal

16760-16820 CHK (80%): pred medgy-gy, occ dk gy-lt brn, tr lt brn-si blk, bf-gy mot thru, pred frm, occ si hd, pred sb blk-y-biky, si-mod arg, rrr lse euhed cal, mod calc incl, rr pyr, MRLST (20%): dk-med gy, sme si blk, sb blk-y, si frm-frm, ip hd, arg, cal incl, rr frac fl cal

16820-16880 CHK (80%): pred medgy-gy, occ dk gy-lt brn, tr lt brn-si blk, bf-gy mot thru, pred frm, occ si hd, pred sb blk-y-biky, si-mod arg, rrr lse euhed cal, mod calc incl, rr pyr, MRLST (20%): dk-med gy, sme si blk, sb blk-y, si frm-frm, ip hd, arg, cal incl, rr frac fl cal

16880-16910 CHK (80%): pred medgy-gy, occ dk gy-lt brn, tr lt brn-si blk, bf-gy mot thru, pred frm, occ si hd, pred sb blk-y-biky, si-mod arg, rrr lse euhed cal, mod calc incl, rr pyr, MRLST (20%): dk-med gy, sme si blk, sb blk-y, si frm-frm, ip hd, arg, cal incl, rr frac fl cal



