



Empirica

Scale: 5" / 100'
Measured Depth Log

Well Name Johnson Trust 5

Location Sec. 13-T2N-R68W

State Colorado

Country USA

API Number 05-123-42321-00

Geographic Region DJ Basin

Spud Date 1/26/2016

County Weld

Rig Number Patterson UTI 346

Field Wattenberg

Drilling Completed 1/28/2016

Surface Coordinates SHL: 2153' FSL, 389' FWL Sec. 13 T2N R68W

Lat: 40° 8' 15.526 N

Long: 104° 57' 34.628 W

Bottom Hole Coordinates PBHL:

Lat: 40° 7' 31.188 N

Long: 104° 57' 19.908 W

Ground Elevation 4,925'

K.B. Elevation 4,949.5'

Logged Interval 7,000' **To** 12,330'

Total Depth 12,330'

Formation Codell

Type of Drilling Fluid Oil Based - invert

Operator

Company Extraction Oil & Gas

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

Geologist

Name Vivian Spiess / Jared Rouse

Company Extraction Oil & Gas

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



Other

Equipment ML-113

Comments Start: 1-26-16
Standby: TBD
TD: 1-28-16

Services Provided 2-man Logging
On Site Geosteering

Logger Names Dominic Pitre / Nicholas V

Address Empirica, LLC.
6360 W Sam Houston Pk
Suite 100
Houston, TX 77041

Zone Color Coding

Oil

Note

Error

Condensate

Core

Water

Gas

Pressure

Seal

Rock Types

UNKNOWN

ANHYDRITE

GYPSUM

SALT

SIDERITE or LIMONITE

LIMESTONE

DOLOMITE

CHERT

COAL

MARLSTONE

CLAYSTONE

SHALE

SHALE GRAY

SHALE COLORED

SILTSTONE

SANDSTONE

CONGLOMERATE

BRECCIA

TILL

BENTONITE

TUFF

IGNEOUS

METAMORPHIC

CEMENT

Accessories

F FOSSIL

GASTROPOD

O OOLITE

OSTRACOD

PELECYPOD

PELLET

PISOLITE

PLANT REMAINS

PLANT SPORES

SCAPHOPOD

STROMATOPOROID

ECHINOID

FISH

FORAMINIFERA

ARGILLACEOUS

ARGILLITE GRAIN

B BENTONITE

BITUMENOUS SUBSTANCE

BRECCIA FRAGMENTS

CALCAREOUS

CARBONACEOUS FLAKES

CHTDK

CHTLT

COAL - THIN BEDS

DOLOMITIC

+ FELDSPAR

FERRUGINOUS PELLET

FERRUGINOUS

GLAUCONITE

GYPSIFEROUS

H HEAVY MINERAL

K KAOLIN

M MARLSTONE

MINERAL CRYSTALS

N NODULES

PHOSPHATE PELLETS

P PYRITE

SALT CAST

S SANDY

S SILICEOUS

TUFFACEOUS

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 Sy

O ORGANIC

P PINPOINT

D DEAD

EVEN

QUESTIONABLE

SPOTTED STAINING

GAS SH

MINDEPTH

V VUGGY

NORMAL

OIL SH

OVERTURN

Engineering

CASING

REVERS

OVERT

CONNECTION (LEFT)

CONNECTION (RIGHT)

SIDEWA

Porosity

E EARTHY

F FENESTRAL

F FRACTURE

X INTERCRYSTALLINE

I INTEROOLITIC

M MOLDIC

CONNECTION GAS

SLIDE

SURV

CORE - RECOVERED

TRIP C

WIRELIN

FAULT

WIRELIN

Watkins
wy N

Symbols

FORMATION TOP L LITHOGRAPHIC

Rounding

LOW MX MICROXLN

MIN DEPTH AN ANGULAR MS MUDSTONE

FL FAULT R ROUNDED PS PACKSTONE

DW SB SUBANG WS WACKESTONE

TURNED STRATA SN SUBRND

Sorting

SE FAULT

Textures

LL CORE (LEFT) M MODERATE

LL CORE (RIGHT) BS BOUNDSTONE P POOR

C CHALKY W WELL

CRY CRYPTOXLN

E EARTHY

IE TESTED - LEFT FX FINELYXLN

IE TESTED - RT GS GRAINSTONE

Extraction OG

Johnson Trust 5

MW 9.1
VIS 38

Well County, Colorado

Spud Date: 01-26-16

Surface Casing @ 1,548'

2-man Logging / Geosteering Began: 01-26-16

ROP
ROP (min/hr/ft)
GAMMA (units)
GAS (units)

Linear Scale

Slide/Rotate

Depth Labels

6,960 6,970 6,980 6,990 7,000 7,010 7,020 7,030 7,040 7,050 7,060 7,070 7,080 7,090 7,100 7,110 7,120 7,130

100 units = 1% methane

1E4 AVG BGG: 160u

1E4 AVG BGG: 300u

Depths Correspond to Driller's Pipe Tally

1,000 1E5

1,000 1E5

GAS
C1
C2
C3
C4

Logarithmic Scale

10 1,000

10 1,000

WOB: 34Klbs
Rotary: 60RPM
Strokes: 160SPM
Pump Rate: 661GPM

▲

▲

Well Bore
TVD

MD: 7,063'
TVD: 6,880.98'
Inclination: 6.05°
Azimuth: 176.94°
VS: -624.98'

TVD (ft)

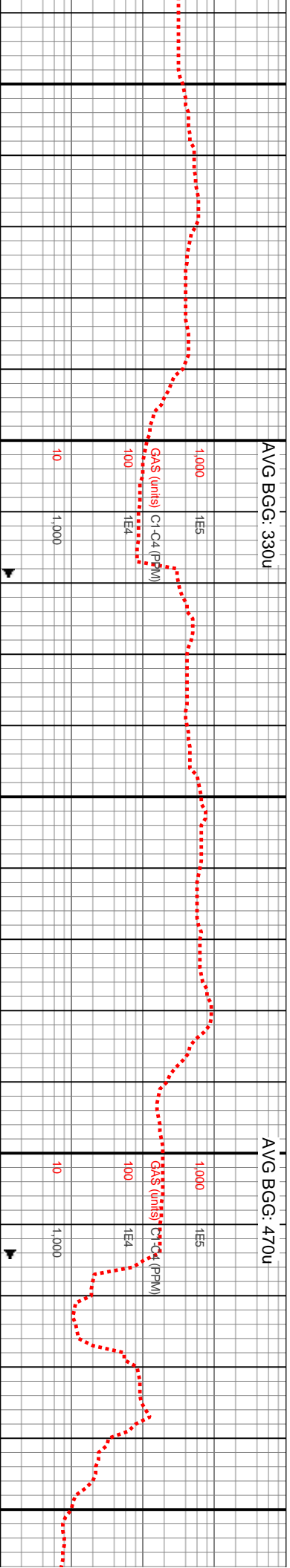
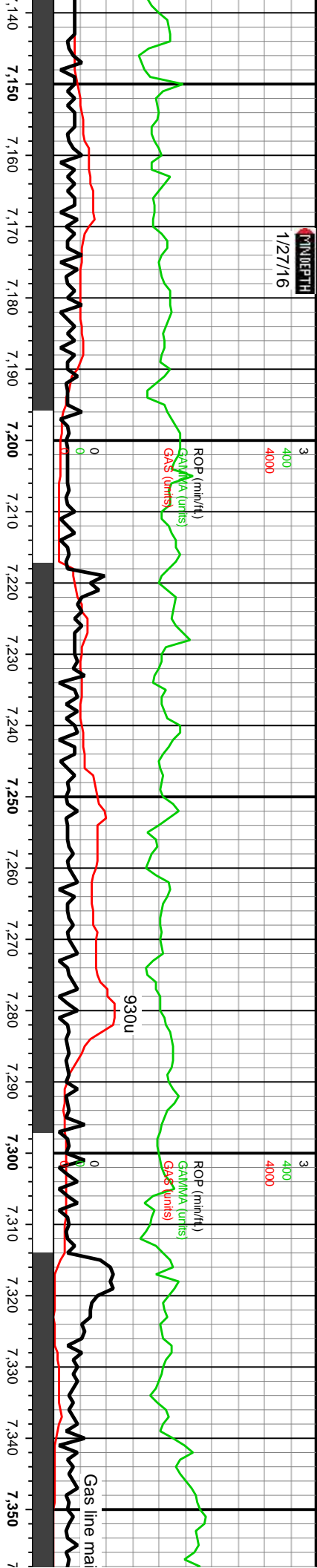
7000-7100 SLTST (55%): dk gy, frm & brit silic ang-pty ctgs, occ cal-silic vn, wi tr-tr vf pyr strg ip, non calc, SLTY SH (35%): lt gy-lt gy tn, med frm-frm, sl hydrated ip, med-hi fis sb ang-biky-tab ctgs, l fis gumbo ctgs, tr vf pyr, sl-mod calc, SS (10%): off wh-v lt gy-occ lt gy brn, occ dk gy silist frag incl, vf p-mod strd sd grs grdg to slt, med frm-frm sil fri mtx-gr sup dls cons wi pred arg cnt, occ dolc & silic cnt, tr vf pyr, pred non calc, sl calc ip

7100-7160 SLTST (55%): dk gy, frm ang-pty ctgs, occ cal-silic vn, wi tr-tr calc, SLTY SH (45%): lt gy-lt gy tn, hydrated ip, med-hi fis sb ang-biky-tab gumbo ctgs, tr vf pyr, sl-mod calc

8400

Images





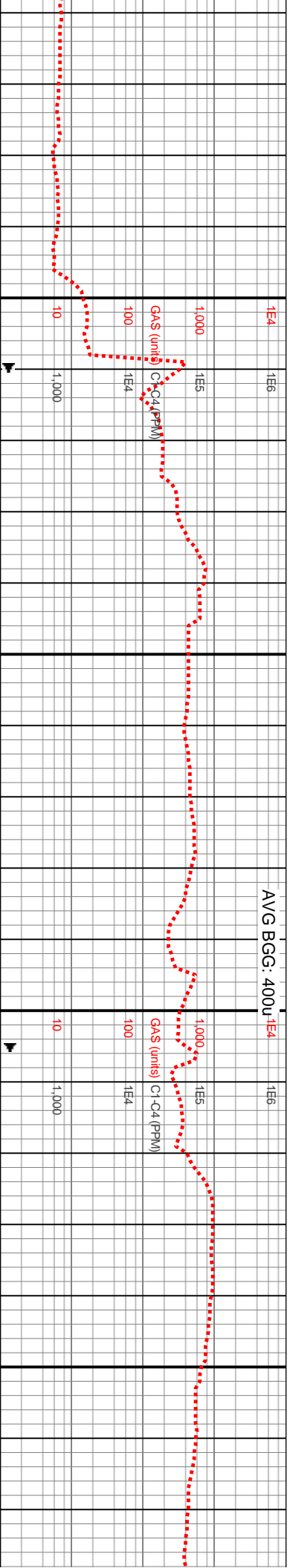
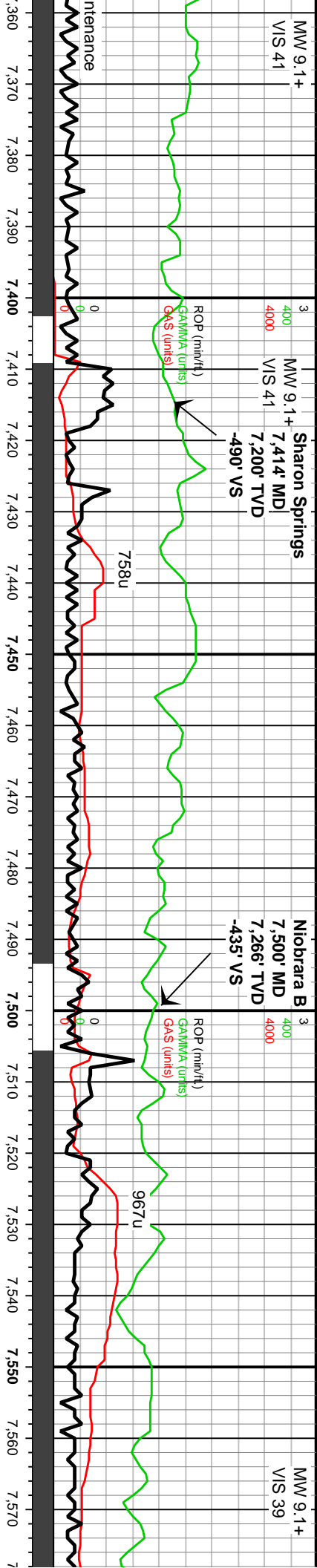
MD: 7,159'
TVD: 6,974.77'
Inclination: 17.68°
Azimuth: 171.59°
VS: -605.44'

WOB: 43Klbs
Rotary: 0RPM
Strokes: 160SPM
Pump Rate: 660GPM

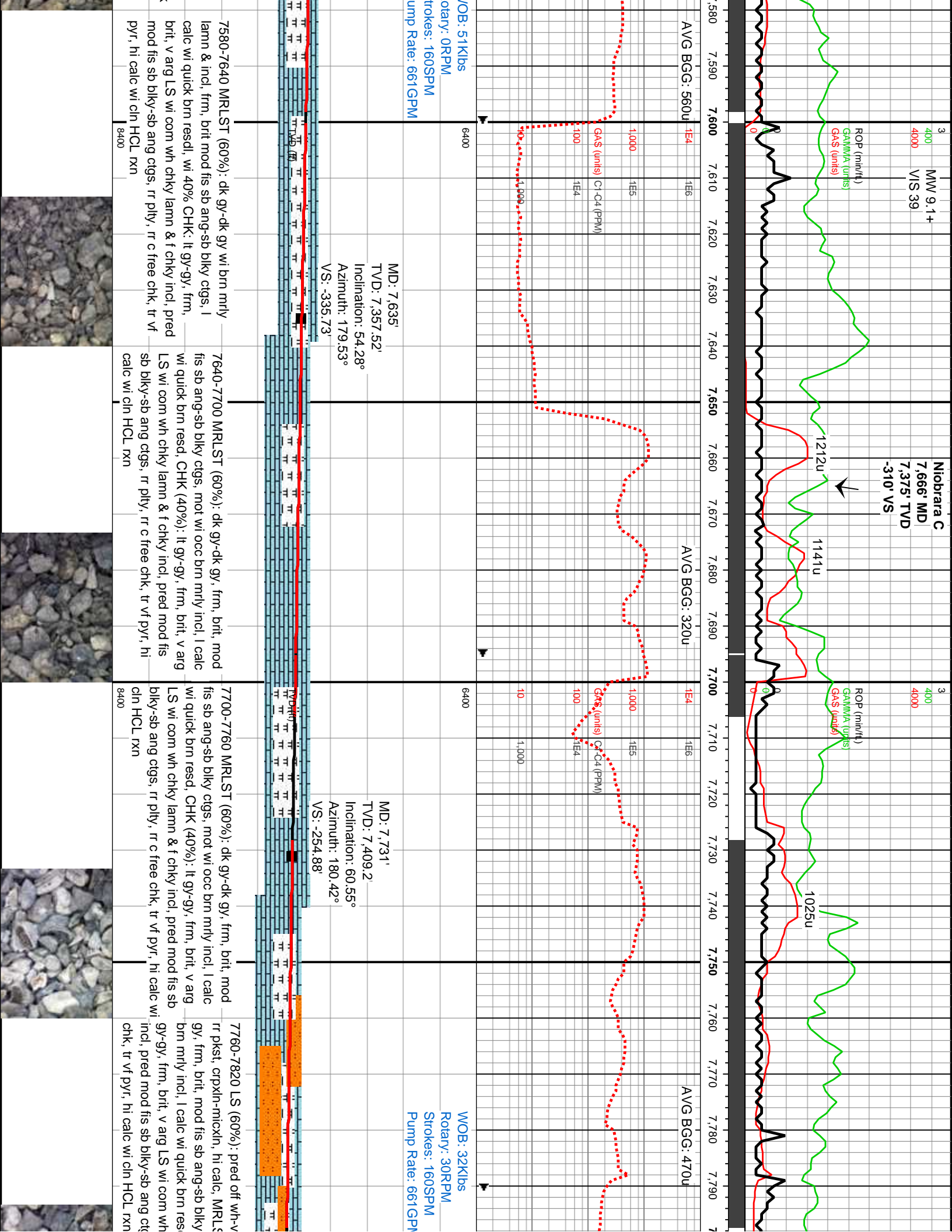
MD: 7,254'
TVD: 7,063.64'
Inclination: 23.67°
Azimuth: 181.37°
VS: -572.06'

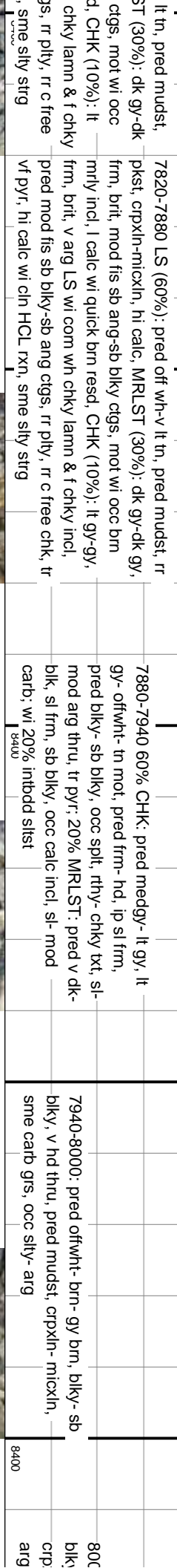
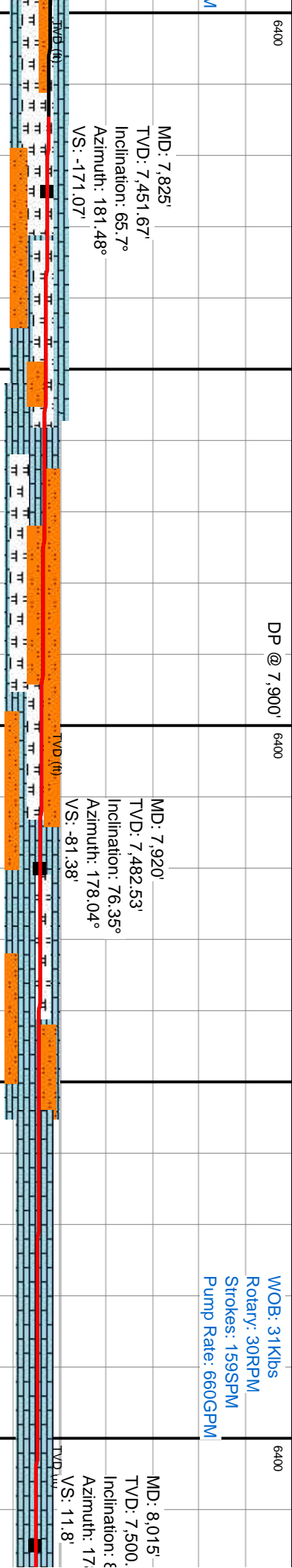
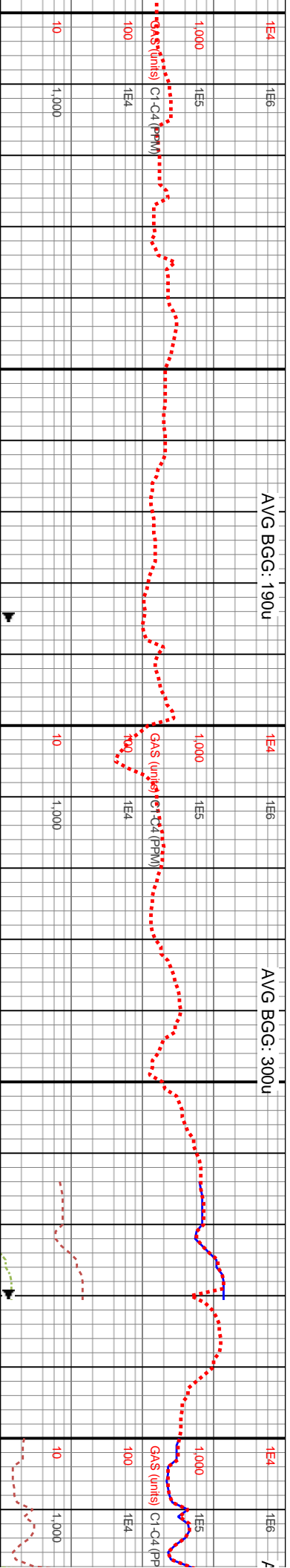
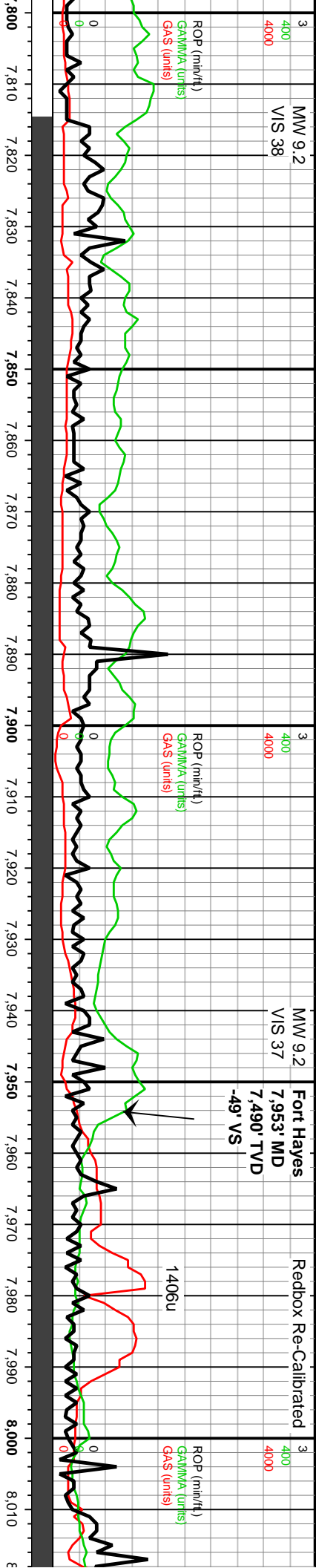
MD: 7,350'
TVD: 7,148.28'
Inclination: 32.43°
Azimuth: 183.4°
VS: -527.01'

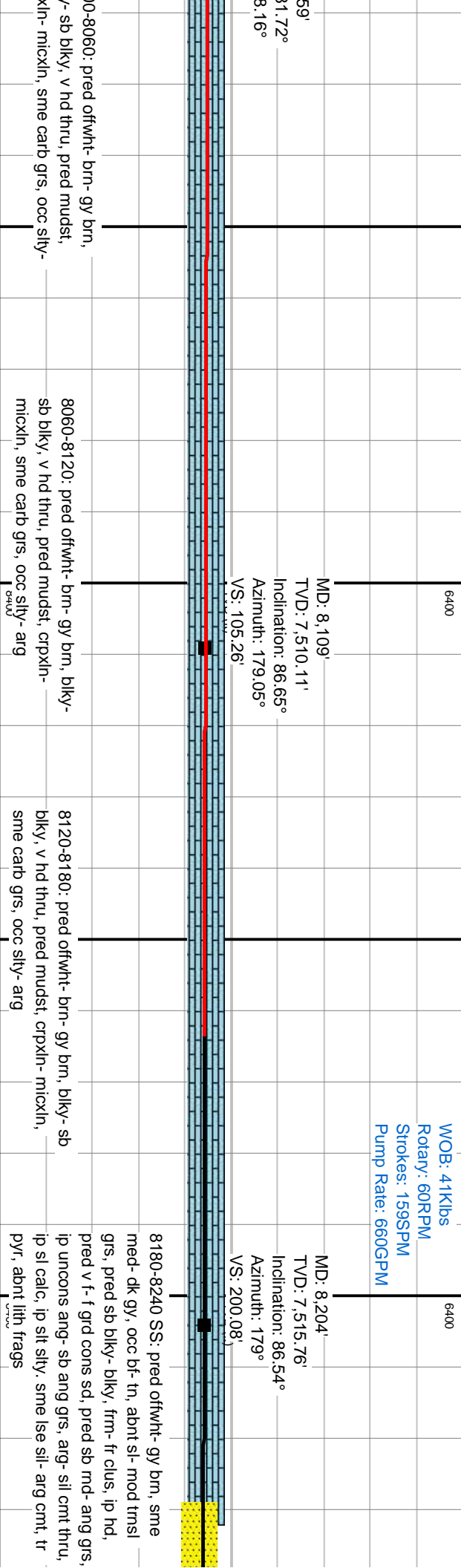
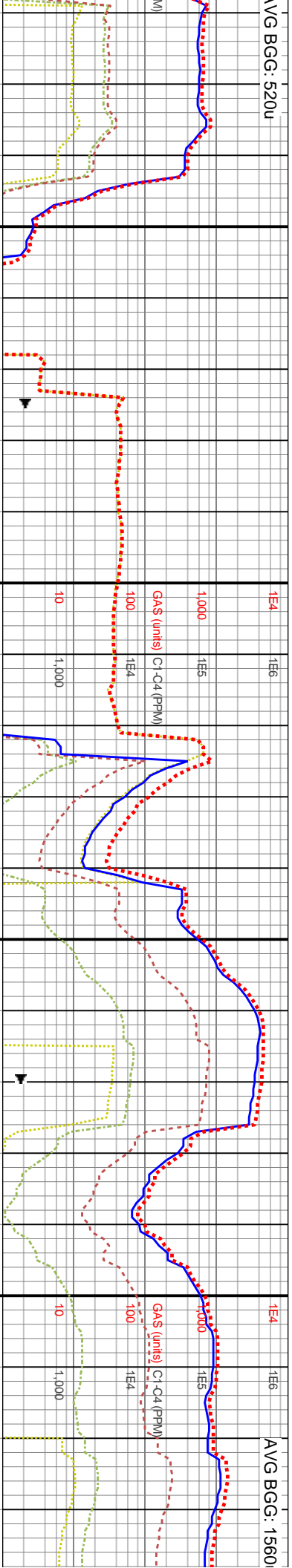
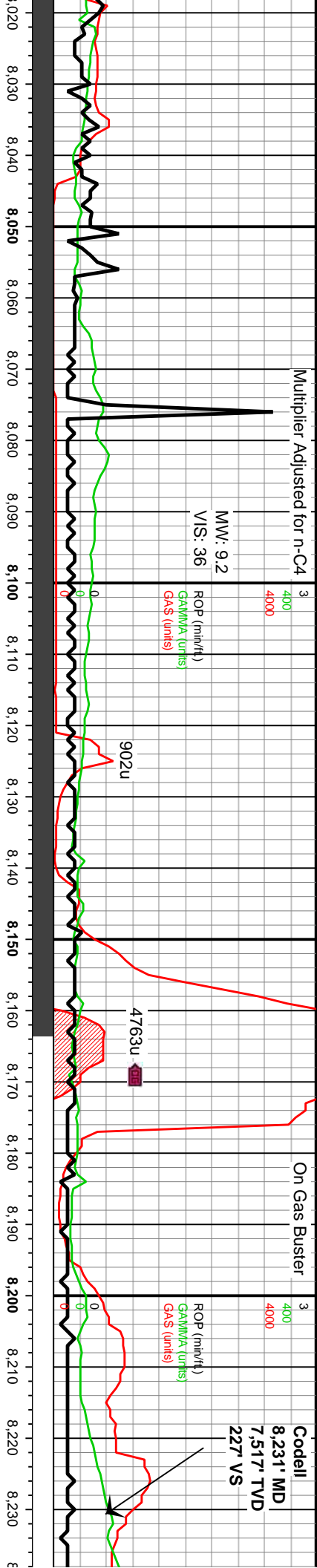
7160-7220 SLTST (50%): dk gy, frm & brit silic ang-pty ctgs, occ cal-silic vn, wi tr-r vf pyr strg ip, non calc, SLTY SH (50%): lt gy-lt gy tn, med frm-frm, sl hydrated ip, med-hi fis sb ang-bkly-tab ctgs, l fis gumbo ctgs, tr vf pyr, sl-mod calc	8400
7220-7280 SLTST (50%): dk gy-v dk gy, brit, silic, mod-hi fis ang-pty ctgs, occ cal-silic vn thru, wi tr-r vf pyr strg ip, non calc, SLTY SH (50%): lt gy-lt gy bm, med frm-frm, sl hydrated l fis gumbo ctgs ip, med-hi fis sb ang-bkly-tab ctgs, tr vf pyr, sl-mod calc	8400
7280-7340 SLTST (50%): dk gy, frm & brit silic ang-pty ctgs, occ cal-silic vn, wi tr-r vf pyr strg ip, non calc, SLTY SH (50%): lt gy-lt gy tn, med frm-frm, sl hydrated ip, med-hi fis sb ang-bkly-tab ctgs, l fis gumbo ctgs, tr vf pyr, sl-mod calc	8400
7340-7400 SLTST (50%): dk gy, frm & brit silic ang-pty ctgs, occ cal-silic vn, wi tr-r vf pyr strg ip, non calc, SLTY SH (50%): lt gy-lt gy tn, med frm-frm, sl hydrated ip, med-hi fis sb ang-bkly-tab ctgs, l fis gumbo ctgs, tr vf pyr, sl-mod calc	8400

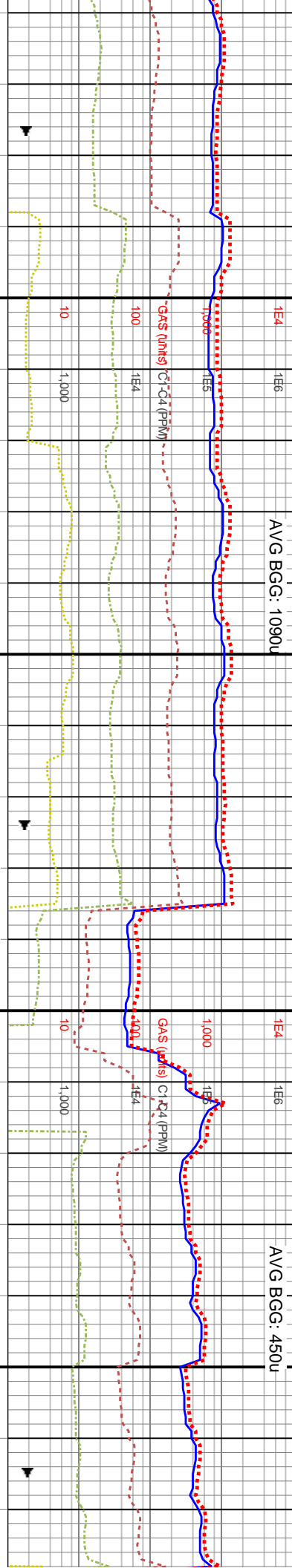
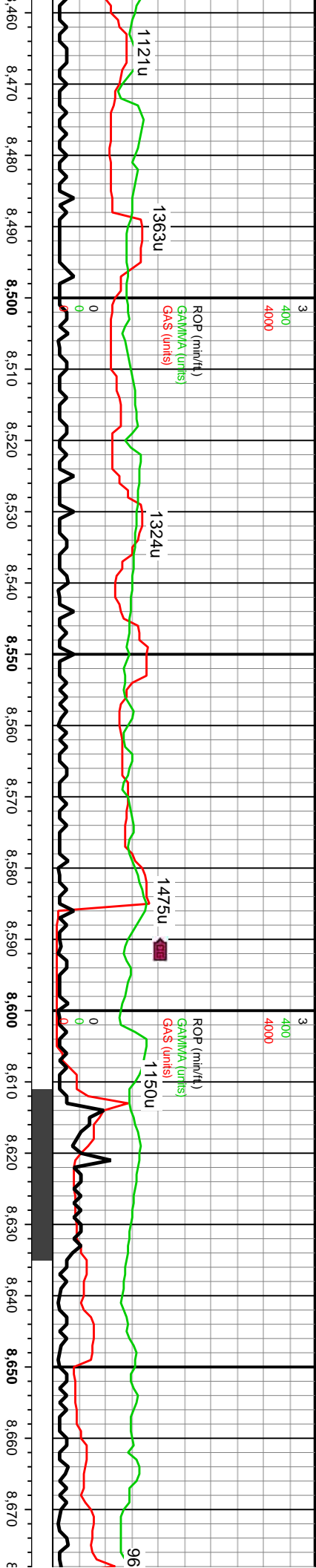


Y SH (60%): lt gy-lt gy brn, med fms sb ang-blky-tab ctgs, l fis sl pyr, sl-mod calc, wi 40% SLTST: dk siltic, mod-hi fis ang-ply ctgs, occ wi tr-tr vf pyr strg ip, non calc	7400-7460 SLTY SH (55%): lt gy-lt gy brn, med frn-frn, med-hi fis sb ang-blky-tab ctgs, l fis sl hydrated ip, tr vf pyr, sl-mod calc, SLTST (45%): dk gy-v-dk gy, brlt, siltic, mod-hi fis ang-ply ctgs, occ cal-siltic vn thru, wi tr-tr vf pyr strg ip, non calc	7460-7520 SH (55%): gy-dk gy, frm, brlt, ang-sb ang-sb rd-sb blkly mod fis ctgs, sm-sltly tex, occ sl incr pk-in-brn mnty incl, tr vf pyr, l-mod calc, wi 35% MRLST: gy-dk gy, frm, brlt, wi pk/in mnty incl, mod calc wi brn resd, wi rr chk	7520-7580 CHK (70%): lt gy-gy, rr dk gy wi OBM sin, frm, brlt, v arg LS wi com wh chky lamm & f chky incl, pred mod fis sb blkly-sb ang ctgs, sl sltly tex, rr c free chk, tr vf pyr, hi calc wi cin HCL rxn, MRLST (30%): dk gy-dk gy wi brn mnty lamm & incl, frm, brlt, mod fis sb ang-sb blkly ctgs, sm-sltly tex, l calc wi quick brn resd
8400	8400	8400	8400









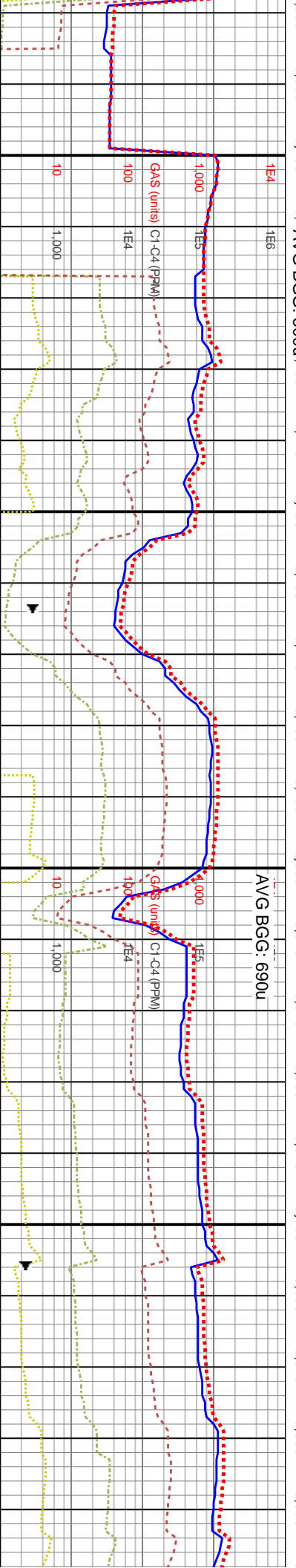
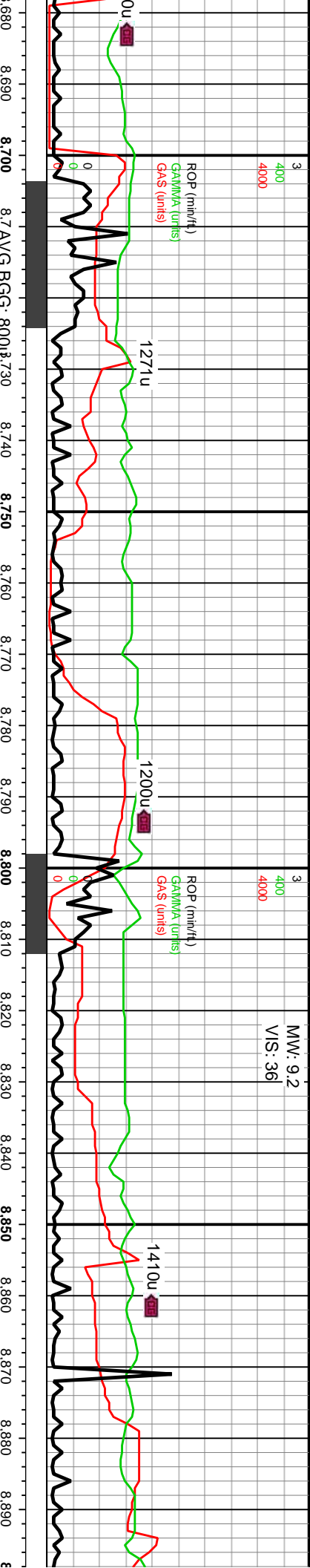
MD: 8,512'
TVD: 7,526.46'
Inclination: 90.1°
Azimuth: 175.35°
TVS: 507.39'

WOB: 40Klbs
Rotary: 61RPM
Strokes: 213SPM
Pump Rate: 655GPM

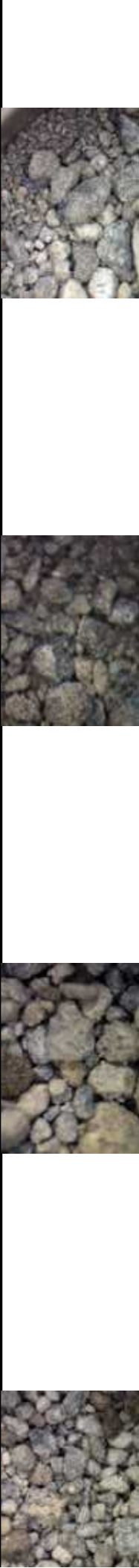
MD: 8,607'
TVD: 7,526.46'
Inclination: 89.9°
Azimuth: 175.9°
VS: 602.11'

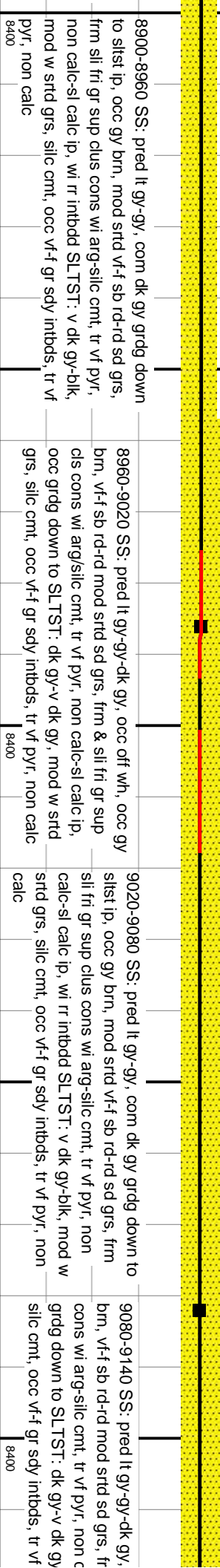
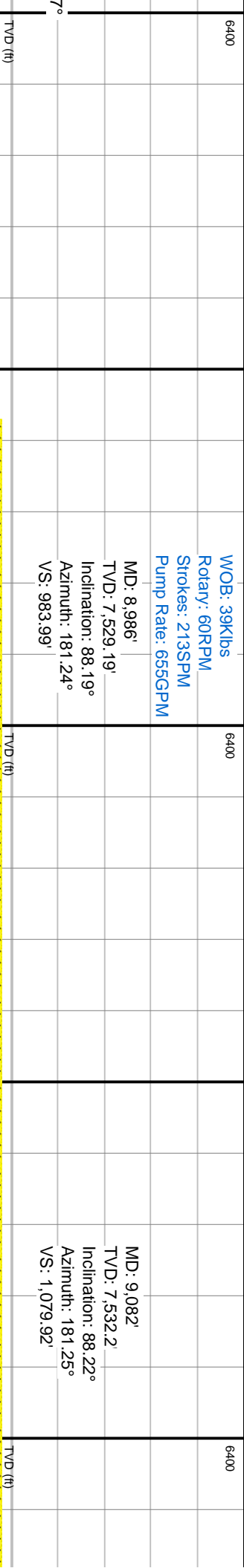
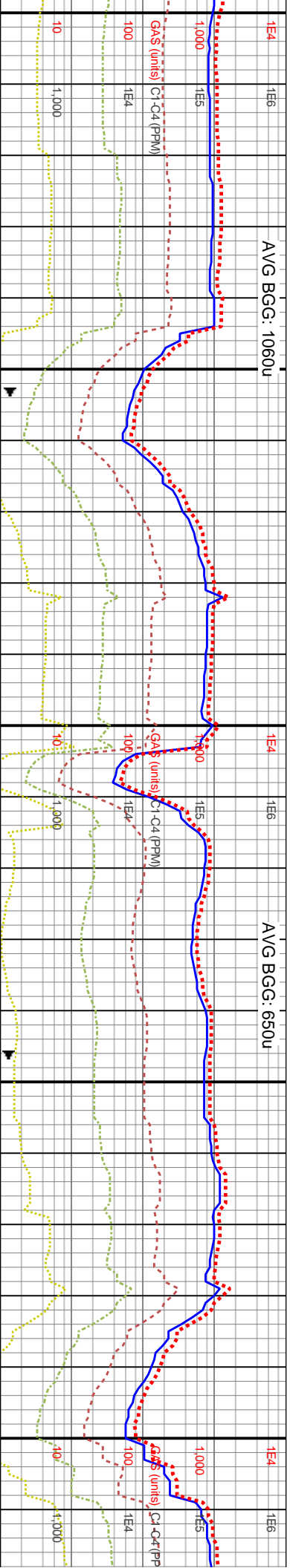
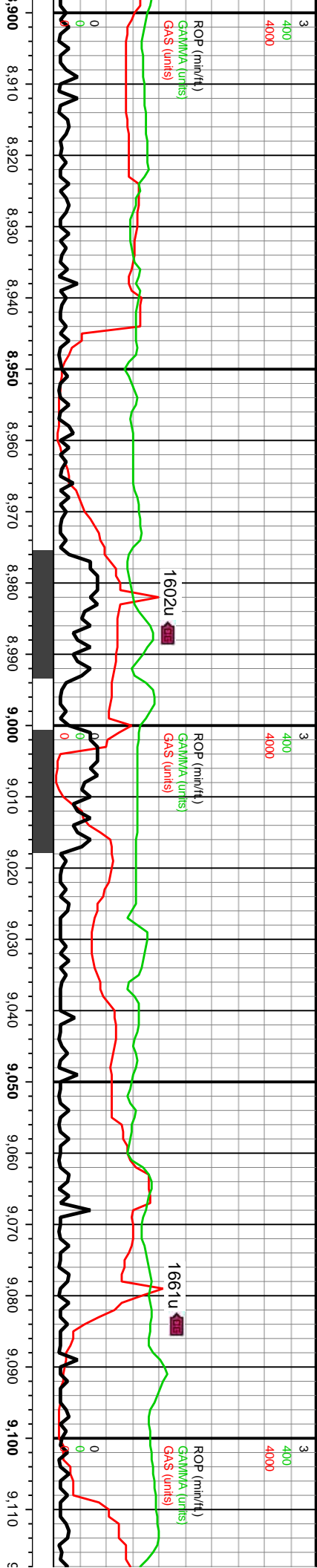
8480-8540 SS: pred tn- gy- med gy brn, sme med- dk gy, abnt sl- mod trnsl grs, pred sb blkly, frm- fr clus, ip hd clus, pred v f- f grd cons sd, pred sb rnd- ang grs, occ uncongs ang- sb ang grs, arg- sil cnt thru, ip sl calc, ip slt slty, sme lse sil- arg cnt, tr pyr, abnt lith frags	8540-8600 SS: pred med gy brn, sme med- dk gy, ip tn- offwht mot, abnt sl- mod trnsl grs, pred sb blkly, frm- fr clus, ip hd clus, pred v f- f grd cons sd, pred sb rnd- ang grs, occ uncongs ang- sb ang grs, arg- sil cnt thru, ip sl calc, ip slt slty, sme lse sil- arg cnt, tr pyr, abnt lith frags, tr glau	8600-8660 SS: pred med gy brn, sme med- dk gy, ip tn- offwht mot, abnt sl- mod trnsl grs, pred sb blkly, frm- fr clus, ip hd clus, pred v f- f grd cons sd, pred sb rnd- ang grs, occ uncongs ang- sb ang grs, arg- sil cnt thru, ip sl calc, ip slt slty, sme lse sil- arg cnt, tr pyr, abnt lith frags, tr glau	8660-8720 gy, ip tn- offwht mot, abnt sl- mod trnsl grs, pred sb blkly, frm- fr clus, ip hd clus, pred v f- f grd cons sd, pred sb rnd- ang grs, arg- sil cnt thru, ip sl calc, ip slt slty, sme lse sil- arg cnt, tr pyr, abnt lith frags, tr glau
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SS: pred med gy brn, sme med- dk wht mot, abnt sl- mod trnsi grs, pred - fr clus, ip hd clus, pred v f- f grd cons md- ang grs, occ uncongs ang- sb - sil cnt thru, ip sl calc, ip sl slty, sme cnt, tr pyr, abnt lith frags, tr glau	8720-8780 SS: pred med gy brn, sme med- dk gy, ip tr- offwht mot, abnt sl- mod trnsi grs, pred sb blk, frm- fr clus, ip hd clus, pred v f- f grd cons sd, pred sb md- ang grs, occ uncongs ang- sb ang grs, arg- sil cnt thru, ip sl calc, ip sl slty, sme lse sil- arg cnt, tr pyr, abnt lith frags, tr glau	8780-8840 SS: pred off wh- lt gy, com gy, lt- dk gy brn ip, mod srt v f- f sb rd- rd sd grs, frm sil fri gr sup clus cons wi arg- sil cnt, tr vf pyr, pred non calc, l calc ip	8840-8900 SS: pred off wh- lt gy, com gy, lt- dk gy brn ip, mod srt v f- f sb rd- rd sd grs, frm sil fri gr sup clus cons wi arg- sil cnt, tr vf pyr, non calc- sl calc ip, wi rr intbdt SLTST: v dk gy- blk, mod w srt grs, silc cnt, occ v f- f gr sdy intbds, tr vf pyr, non calc
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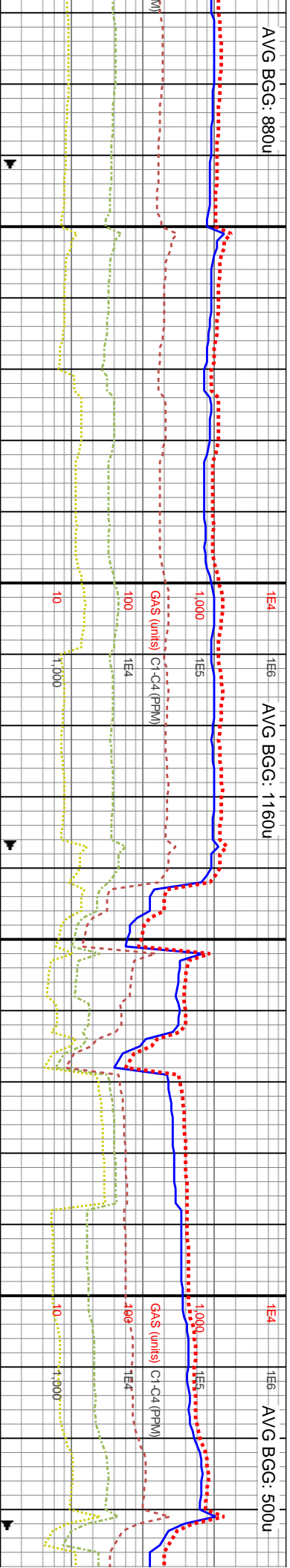
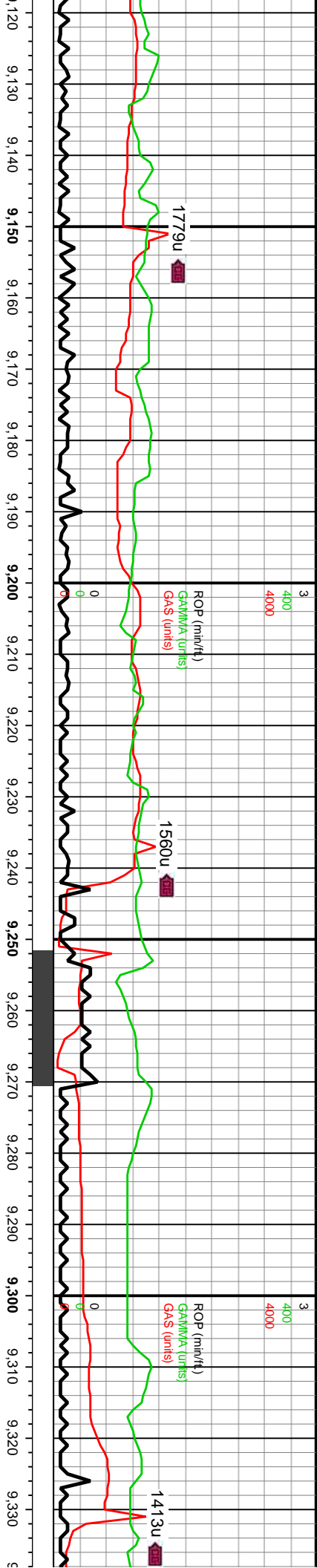


8900-8960 SS: pred lt gy-gy, com dk gy grdg down to siltst ip, occ gy brn, mod strd vf-f sb rd-rd sd grs, frm sli fri gr sup clus cons wi arg-silic cnt, tr vf pyr, non calc-sil calc ip, wi rr intbdd SLTST: v dk gy-blk, mod w strd grs, silic cnt, occ vf-f gr sdy intbds, tr vf pyr, non calc	8960-9020 SS: pred lt gy-gy-dk gy, occ off wh, occ gy brn, vf-f sb rd-rd mod strd sd grs, frm & sli fri gr sup cls cons wi arg/silic cnt, tr vf pyr, non calc-sil calc ip, occ grdg down to SLTST: dk gy-v dk gy, mod w strd grs, silic cnt, occ vf-f gr sdy intbds, tr vf pyr, non calc	9020-9080 SS: pred lt gy-gy, com dk gy grdg down to siltst ip, occ gy brn, mod strd vf-f sb rd-rd sd grs, frm sli fri gr sup clus cons wi arg-silic cnt, tr vf pyr, non calc-sil calc ip, wi rr intbdd SLTST: v dk gy-blk, mod w strd grs, silic cnt, occ vf-f gr sdy intbds, tr vf pyr, non calc	9080-9140 SS: pred lt gy-gy-dk gy, brn, vf-f sb rd-rd mod strd sd grs, tr cons wi arg-silic cnt, tr vf pyr, non c grdg down to SLTST: dk gy-v dk gy silic cnt, occ vf-f gr sdy intbds, tr vf
8400	8400	8400	8400

WOB: 39Klbs
Rotary: 60RPM
Strokes: 213SPM
Pump Rate: 655GPM

MD: 8,986'
TVD: 7,529.19'
Inclination: 88.19°
Azimuth: 181.24°
VS: 983.99'

MD: 9,082'
TVD: 7,532.2'
Inclination: 88.22°
Azimuth: 181.25°
VS: 1,079.92'



WOB: 34Klbs
Rotary: 60RPM
Strokes: 212SPM
Pump Rate: 653GPM

MD: 9,176'
TVD: 7,535.39'
Inclination: 87.89°
Azimuth: 181.33°
VS: 1,173.83'

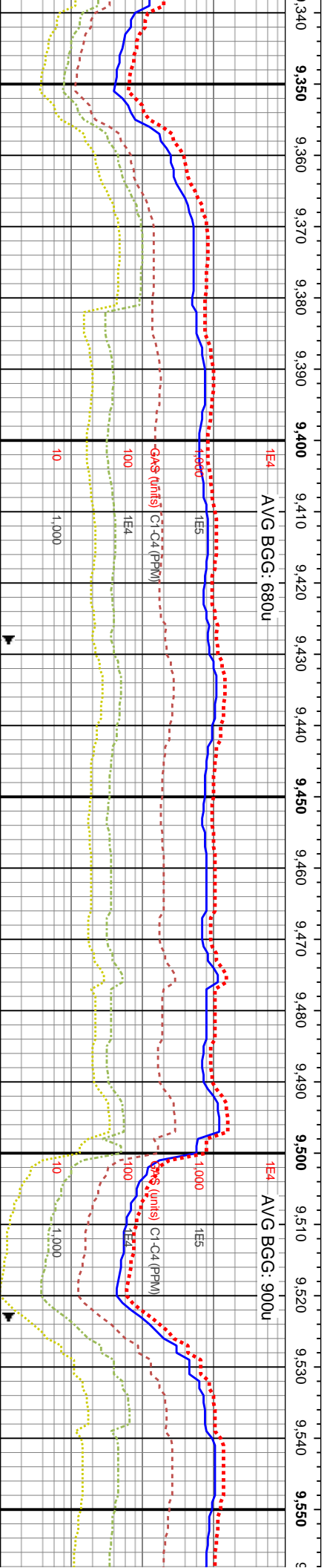
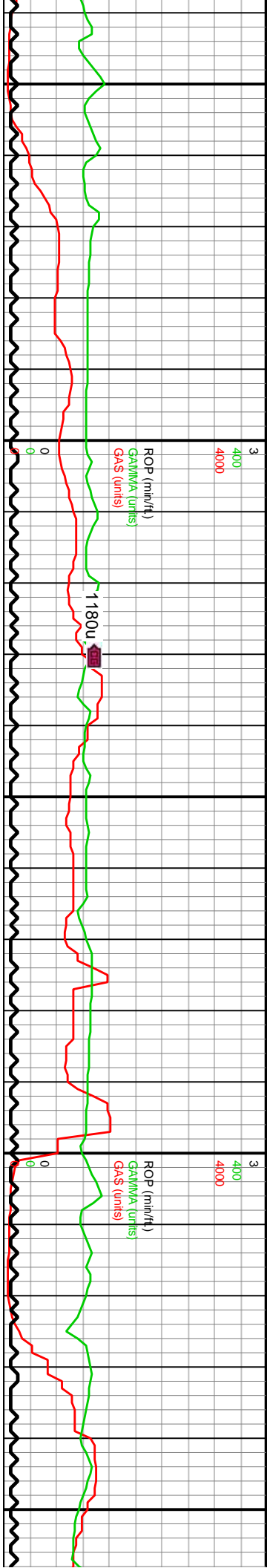
TVD (ft)

MD: 9,272'
TVD: 7,537.8'
Inclination: 89.23°
Azimuth: 179.91°
VS: 1,269.79'

TVD (ft)

occ off wh, occ gy m, sil fri gr sup cils calc-sil calc ip, occ pyr, non calc	9140-9200 SS: pred lt gy-gy, com dk gy grdg down to silst ip, occ gy brn, mod strd vf-f sb rd-rd sd grs, frm sil fri gr sup clus cons wi arg-silic cnt, tr vf pyr, non calc-sil calc ip, wi rr intbdd SLTST: v dk gy-blk, mod w strd grs, silic cnt, occ vf-f gr sdy intbds, tr vf pyr, non calc	9200-9260 SS: pred off wh-lt gy, com gy, lt-dk gy brn ip, mod strd vf-f sb rd-rd sd grs, frm sil fri gr sup clus cons wi arg-silic cnt, tr vf pyr, non calc-sil calc ip, wi rr intbdd SLTST: v dk gy-blk, mod w strd grs, silic cnt, occ vf-f gr sdy intbds, tr vf pyr, non calc	9260-9320 SS: pred lt gy-gy, com dk gy grdg down to silst ip, occ gy brn, mod strd vf-f sb rd-rd sd grs, frm sil fri gr sup clus cons wi arg-silic cnt, tr vf pyr, non calc-sil calc ip, wi rr intbdd SLTST: v dk gy-blk, mod w strd grs, silic cnt, occ vf-f gr sdy intbds, tr vf pyr, non calc	9320-9380 SS: ip, mod strd vf-f cons wi arg-silic intbdd SLTST: v occ vf-f gr sdy il
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WOB: 41Klbs
Rotary: 60RPM
Strokes: 212SPM
Pump Rate: 653GPM

MD: 9,368'
TVD: 7,538.73'
Inclination: 89.66°
Azimuth: 180.88°
VS: 1,365.78'

TVD (ft)

pred off wh-it gy, com gy, lt-dk gy brn
sb rd-rd sd grs, frm sli fri gr sup clus
cmt, tr vf pyr, non calc-sl calc ip, wi tr
v dk gy-blk, mod w strd grs, silic cmt,
ntbds, tr vf pyr, non calc

9380-9440 SS: pred lt gy-gy, sl brn hue ip, mod
strd vf-f sb rd-rd sd grs, frm sli fri gr sup clus cons
wi arg-silic cmt, tr vf pyr, non calc-sl calc ip

8400

MD: 9,463'
TVD: 7,539.09'
Inclination: 89.9°
Azimuth: 181.47°
VS: 1,460.75'

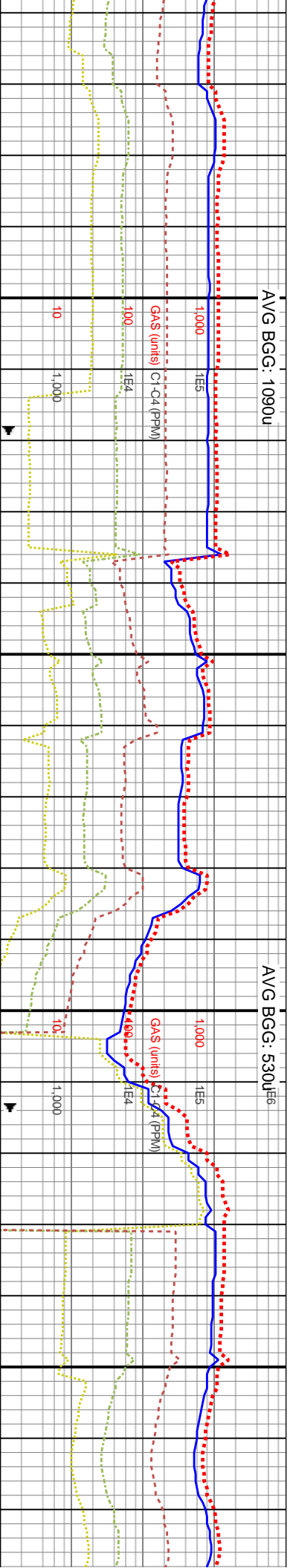
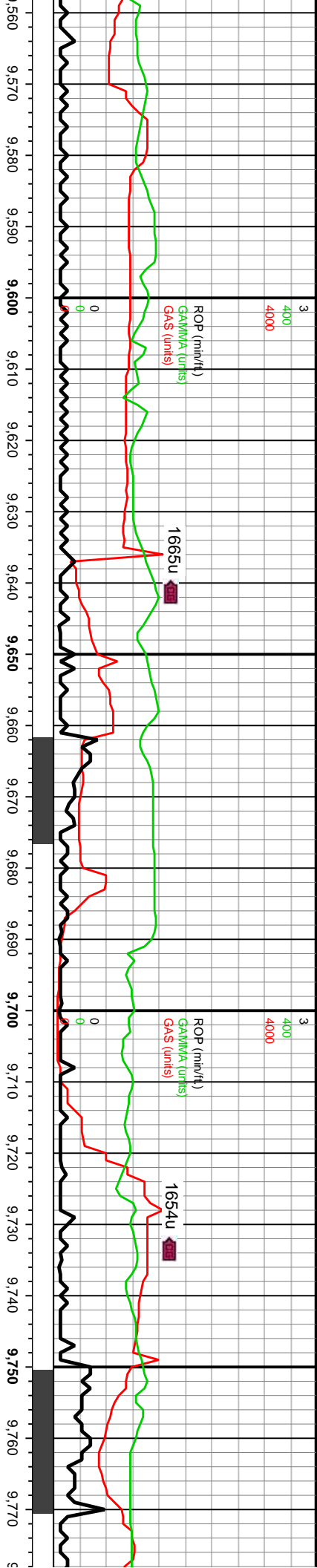
TVD (ft)

9440-9500 SS: pred lt gy-gy, occ off wh,sl brn hue ip,
mod strd vf-f sb rd-rd sd grs, frm sli fri gr sup clus
cons wi arg-silic cmt, tr vf pyr, pred non calc, l calc ip

8400

9500-9560 SS: pred lt gy-gy, sl brn hue ip, mod strd
vf-f sb rd-rd sd grs, frm sli fri gr sup clus cons wi
arg-silic cmt, tr vf pyr, non calc-sl calc ip





WOB: 43Klbs
Rotary: 60RPM
Strokes: 212SPM
Pump Rate: 653GPM

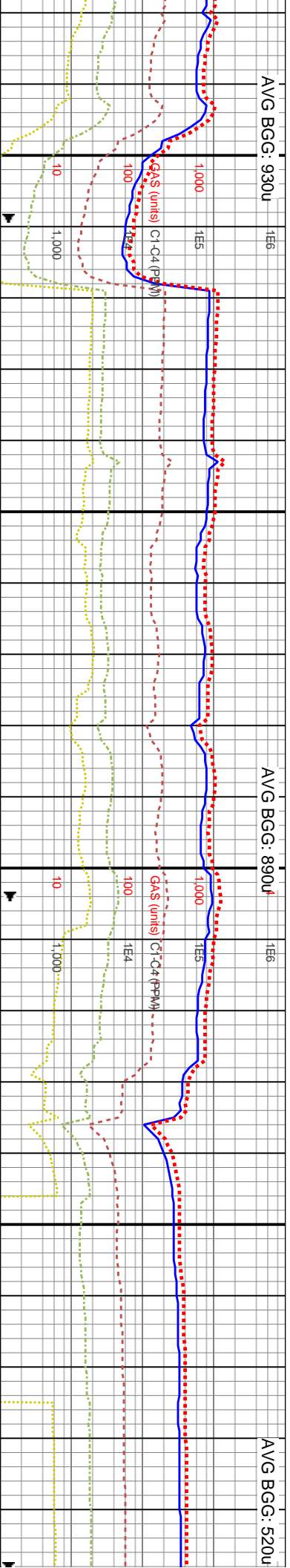
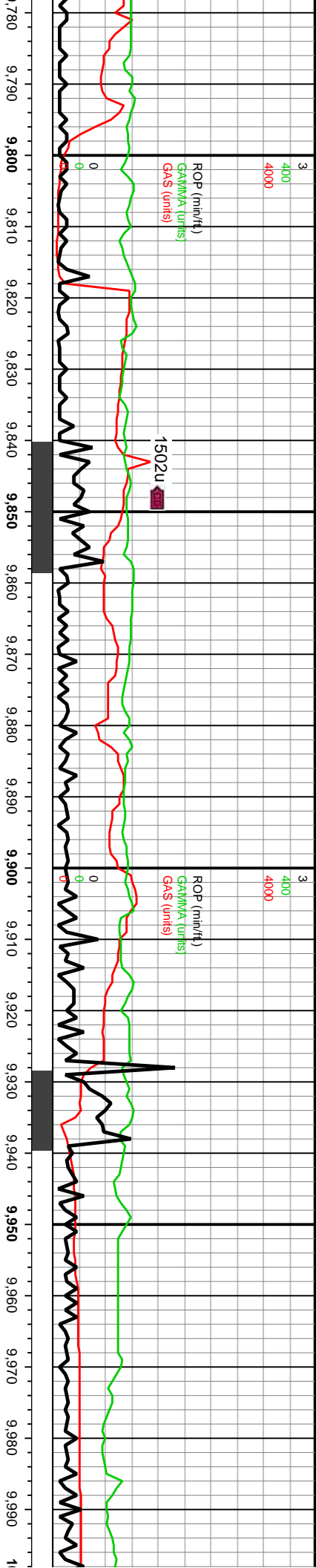
539.2
on: 89.97°
i: 181.26°
66.72

MD: 9,654'
TVD: 7,537.18'
Inclination: 92.48°
Azimuth: 181.85°
VS: 1,651.65'

MD: 9,749'
TVD: 7,533.78'
Inclination: 91.61°
Azimuth: 181.18°
VS: 1,746.54'

9560-9620 SS, pred lt gy-gy, occ off wh, sl brn hue ip, mod strd vf-f sb rd-rd sd grs, frm sil fri gr sup clus cons wi arg-silic cnt, tr vf pyr, non calc-sl calc ip	8400
9620-9680 SS, pred gy wi sl brn hue, com gy-lt gy, occ off wh, mod strd vf-f sb rd-rd sd grs, frm sil fri gr sup clus cons wi arg-silic cnt, tr vf pyr, non calc-sl calc ip, wi rr intbdd SLTST: v dk gy-blk, mod w strd grs, silc-arg, silty-sm tex ip, tr vf pyr, non calc	8400
9680-9740 SS: lt gy-gy, com brn hue thru, occ off wh, mod strd vf-f sb rd-rd sd grs, frm sil fri gr sup clus cons wi arg-silic cnt, tr vf pyr, non calc-sl calc ip, wi rr intbdd SLTST: v dk gy-blk, mod w strd grs, silc-arg cigs, silty-sm shy tex ip occ vf-f gr sdy intbds, tr vf pyr, non calc	8400
9740-9800 SS: lt gy-gy, com brn h wh, mod strd vf-f sb rd-rd sd grs, f clus cons wi arg-silic cnt, tr vf pyr, ip, wi rr intbdd SLTST: v dk gy-blk silc-arg cigs, occ vf-f gr sdy intbds	





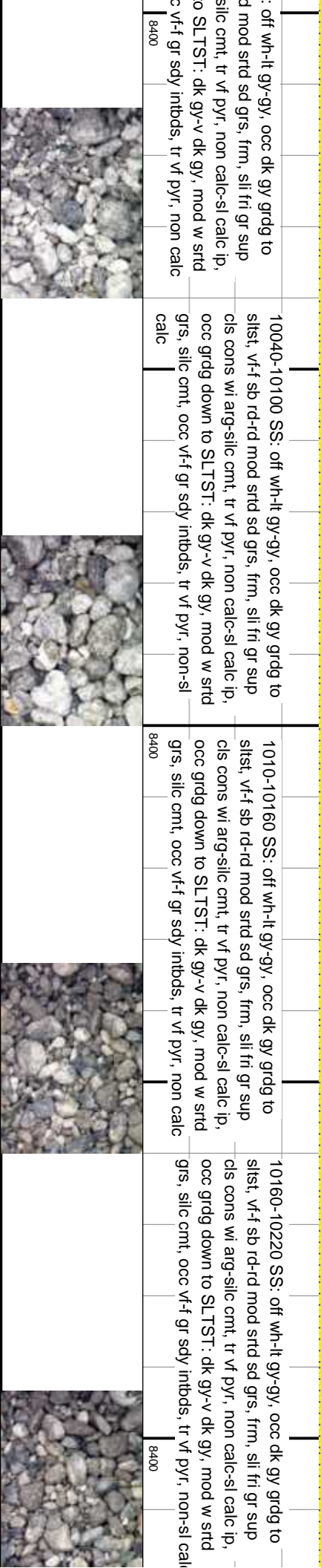
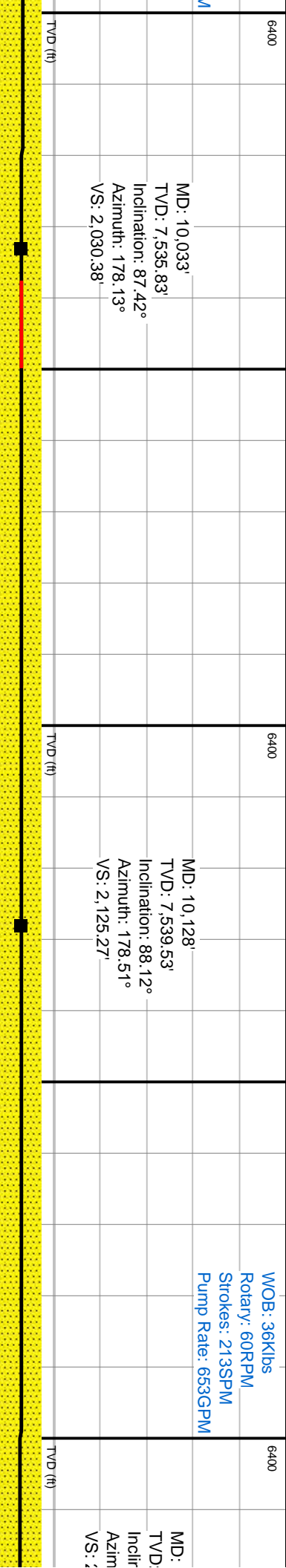
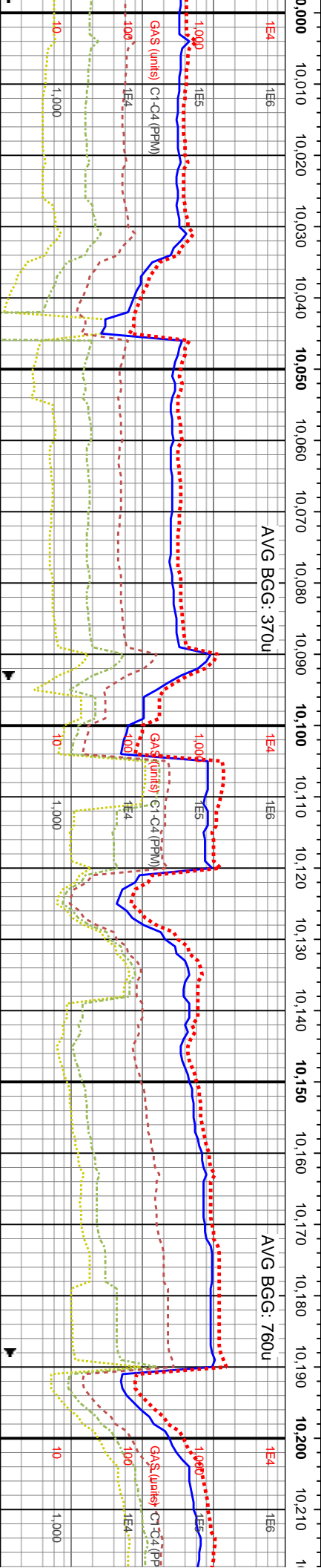
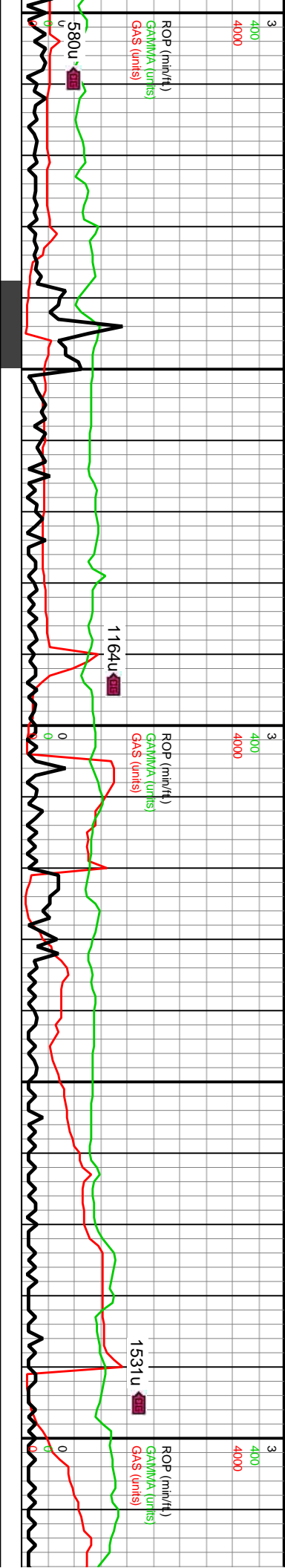
OJB: 42Klbs
Rotary: 61RPM
Strokes: 213SPM
Pump Rate: 653GPM

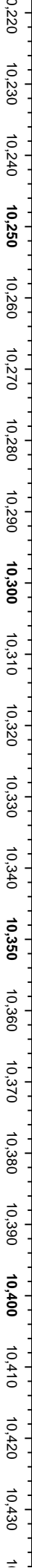
MD: 9,844'
TVD: 7,532.09'
Inclination: 90.44°
Azimuth: 179.16°
VS: 1,841.52'

MD: 9,939'
TVD: 7,532.73'
Inclination: 88.79°
Azimuth: 177.77°
VS: 1,936.48'

WOB: 40Klbs
Rotary: 61RPM
Strokes: 213SPM
Pump Rate: 653GPM

9800-9860 SS: pred gy wi sl brn hue, com gy-lt gy, occ off wh, mod strd vf-f sb rd-rd sd grs, frm sil fri gr sup clus cons wi arg-silic cnt, tr vf pyr, non calc-sil calc ip, wi tr intbdd SLTST: v dk gy-blk, mod w strd grs, silic-arg, silty-sm tex ip, tr vf pyr, non calc	9860-9920 SS: off wh-lt gy-gy, occ dk gy grdg to silst, vf-f sb rd-rd mod strd sd grs, frm, sil fri gr sup clus cons wi arg-silic cnt, tr vf pyr, non calc-sil calc ip, occ grdg down to SLTST: dk gy-v dk gy, mod w strd grs, silic cnt, occ vf-f gr sdy intbds, tr vf pyr, non calc	9920-9980 SS: pred lt gy-gy, com dk gy grdg down to silst ip, occ gy brn, mod strd vf-f sb rd-rd sd grs, frm sil fri gr sup clus cons wi arg-silic cnt, tr vf pyr, non calc-sil calc ip, wi occ intbdd SLTST: v dk gy-blk, mod w strd grs, silic cnt, occ vf-f gr sdy intbds, tr vf pyr, non calc	9980-10040 SS silst, vf-f sb rd-r-cls cons wi arg-occ grdg down t grs, silic cnt, oc
8400	8400	8400	

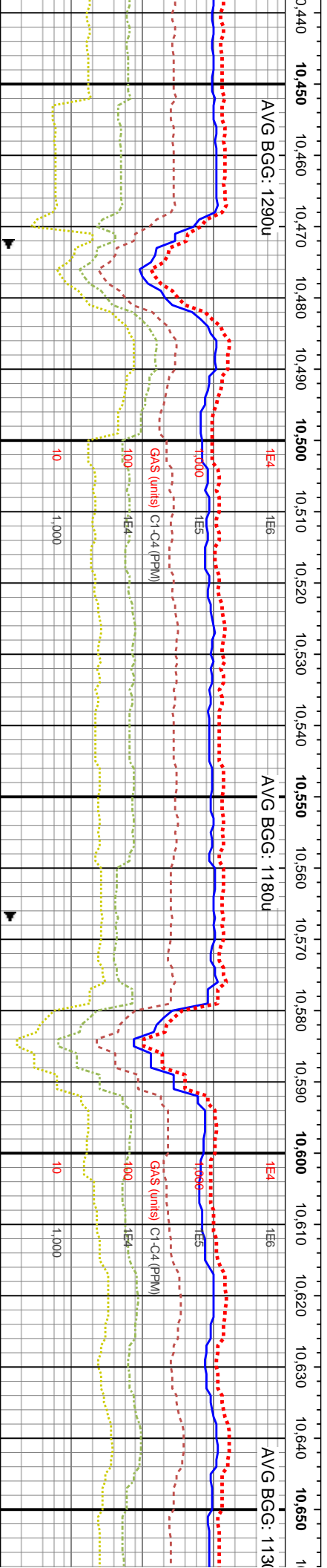
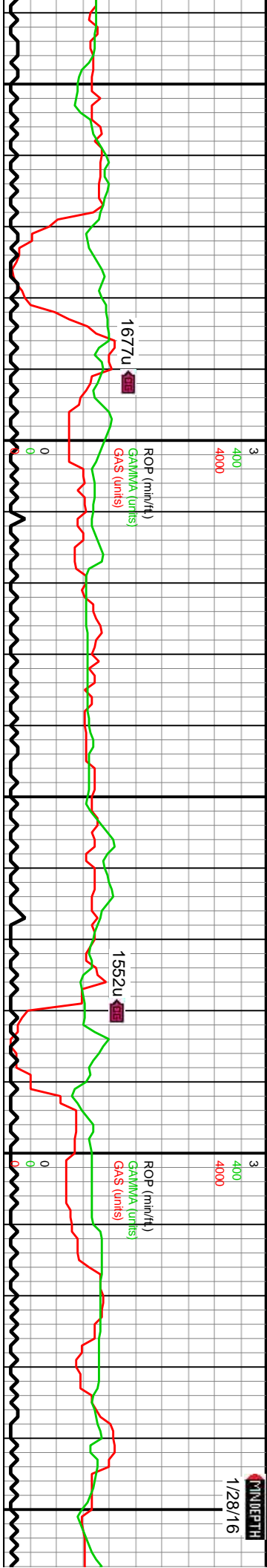




	TVD (ft)
	TVD (ft)

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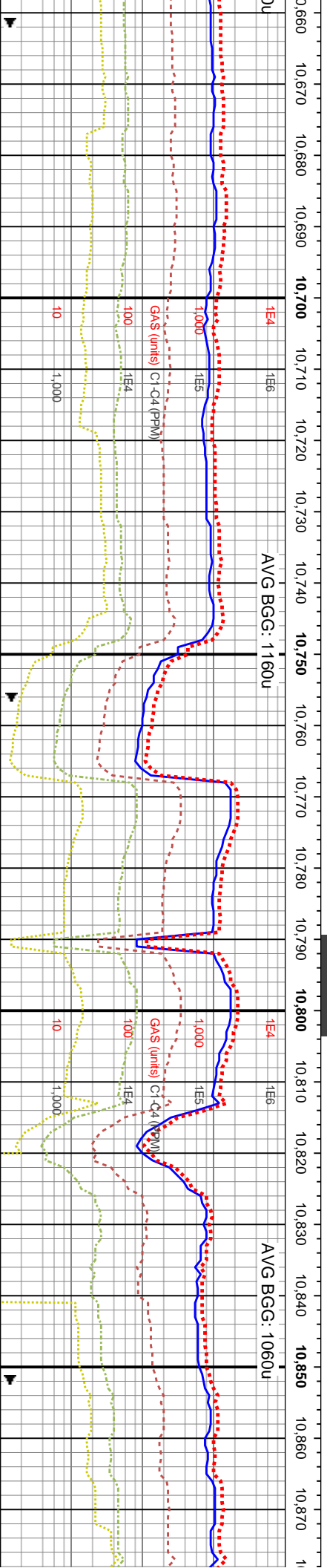
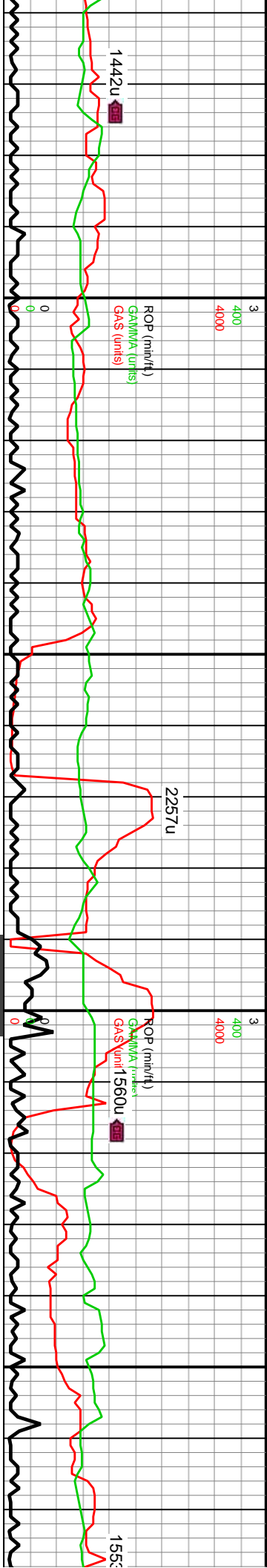
MD: 10,507'
TVD: 7,544.3'
Inclination: 89.93°
Azimuth: 179.3°
VS: 2,504.16'

WOB: 37Klbs
Rotary: 61RPM
Strokes: 212SPM
Pump Rate: 653GPM

MD: 10,602'
TVD: 7,544'
Inclination: 90.44°
Azimuth: 179.79°
VS: 2,599.16'

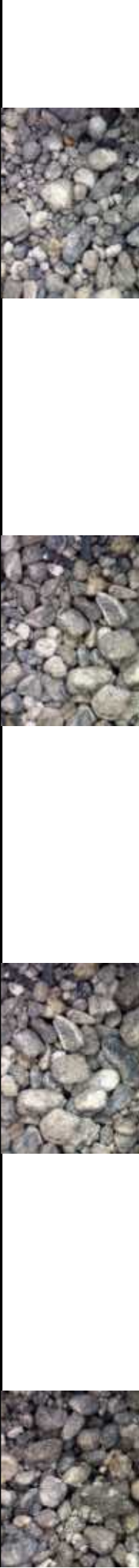
10460-10520 SS (90%): gy-gy w/ brn hue, occ v	10520-10580 SS (90%): pred gy-gy w/ brn hue, occ v	10580-10640 SS (90%): off wh-lt gy-gy intbdd ss, sl	10640-10700 S
gy-off wh, occ dk gy, v-f sb rd-rd mod strd sd grs, frm,	lt gy-off wh, occ dk gy grdg to silst, v-f sb rd-rd mod	brn hue ip, occ dk gy, v-f sb rd-rd mod strd sd grs,	brn hue ip, occ
, tr vf pyr, non	strd sd grs, frm, sil fri gr sup cls cons wi arg-silic cmt, tr vf pyr, non	frm, sil fri gr sup cls cons wi arg-silic cmt, grdd ip, tr	frm, sil fri gr sup
calc-sil calc ip, occ grdg down to dk gy SLTST (10%):	tr vf pyr, non calc-sil calc ip, occ grdg down to 10%	vf pyr, non calc-sil calc ip, occ grdg down to dk gy	non calc-sil calc
dk gy-v dk gy, mod w strd grs, silc, tr vf pyr, non calc	SLTST: dk gy-v dk gy, mod w strd grs, silc cmt, occ v-f-f	SLTST (10%): dk gy-v dk gy, mod w strd grs, silc, tr	(10%): dk gy-v
	gr sdy intbds, tr vf pyr, non calc	vf pyr, non calc	non calc

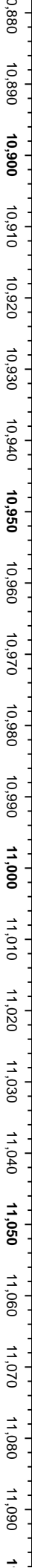




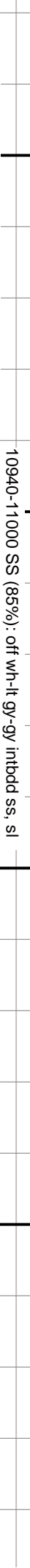
MD: 10,696'
TVD: 7,542.84'
Inclination: 90.97°
Azimuth: 179.16°
VS: 2,693.15'

10700-10760 SS (90%): off wh-it gy-gy intbdd ss, sl brn hue ip, occ dk gy, vf-f sb rd-rd mod strd sd grs, frm, sil fri gr sup cts cons wi arg-silic cmt, trd ip, tr vf pyr, non calc-sil calc ip, occ grdg down to dk gy SLTST (10%): dk gy-v dk gy, mod w strd grs, silic, tr vf pyr, non calc	8400
10760-10820 SS (90%): off wh-it gy-gy intbdd ss, sl brn hue ip, occ dk gy, vf-f sb rd-rd mod strd sd grs, frm, sil fri gr sup cts cons wi arg-silic cmt, grdd ip, tr vf pyr, tr c pyr strg, non calc-sil calc ip, occ grdg down to dk gy SLTST (10%): dk gy-v dk gy, mod w strd grs, silic, tr vf pyr, non calc	8400
10820-10880 SS (85%): pred intbdd lt gy-gy ss, occ gy-dk gy grdg to sltst, sil brn hue ip, vf-f sb rd-rd mod strd sd grs grdg to slt ip, frm, sil fri gr sup cts cons wi arg-silic cmt, tr vf pyr, tr c pyr strg, non calc-sil calc ip, SLTST (15%): dk gy-v dk gy, mod w strd grs, silic, tr vf pyr, non calc	



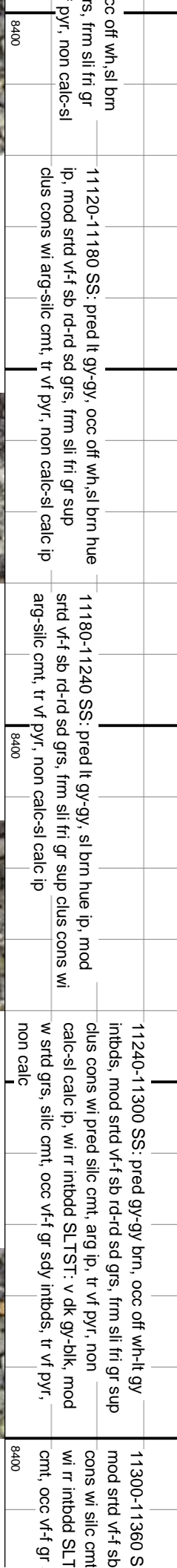
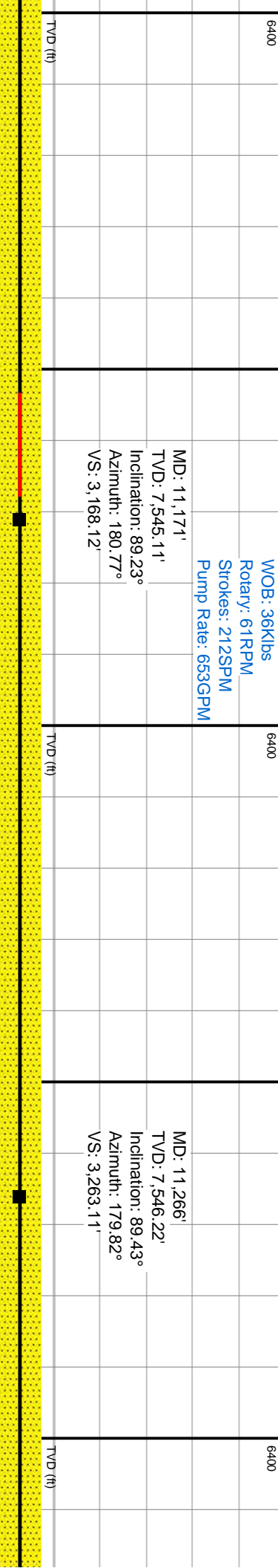
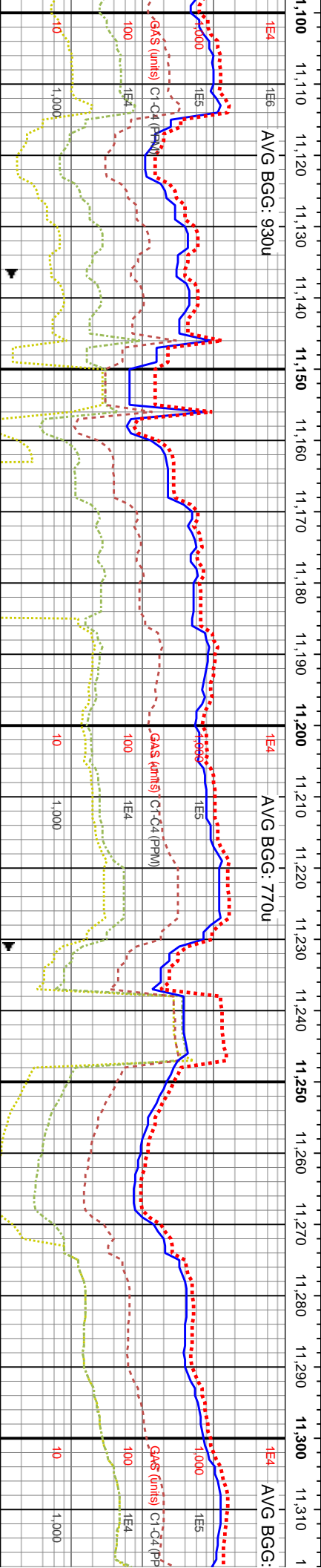
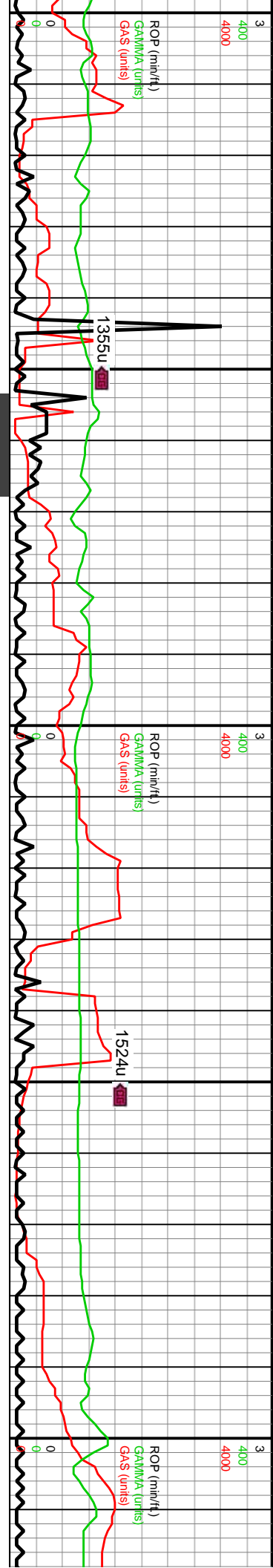


MD: 11,076'
TVD: 7,544.72'
Inclination: 90.3°
Azimuth: 179.9°
VS: 3,073.13'



11060-11120 SS: pred lt gy-gy, on	
hue ip, mod srtf vf-f sb rd-rd sd g	
sup clus cons wi arg-slic cmt, tr vl	
calc ip	

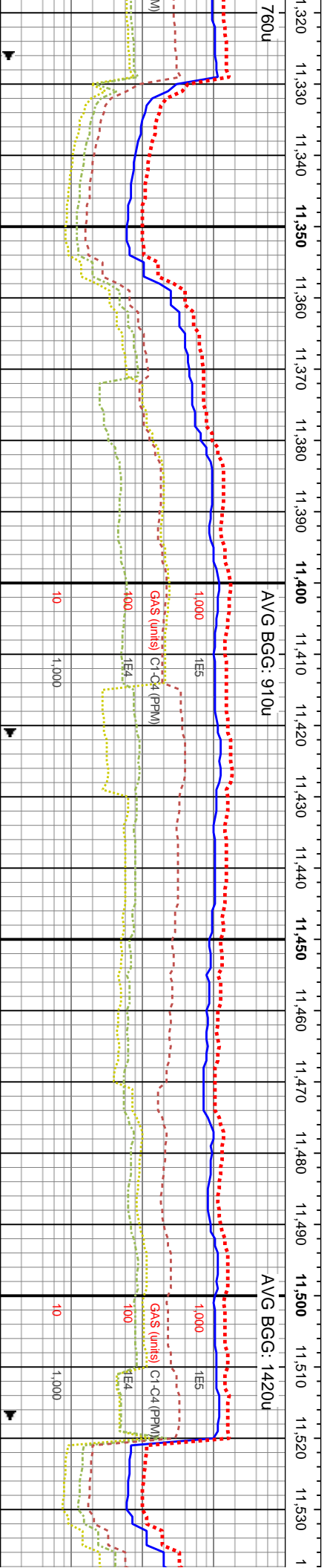
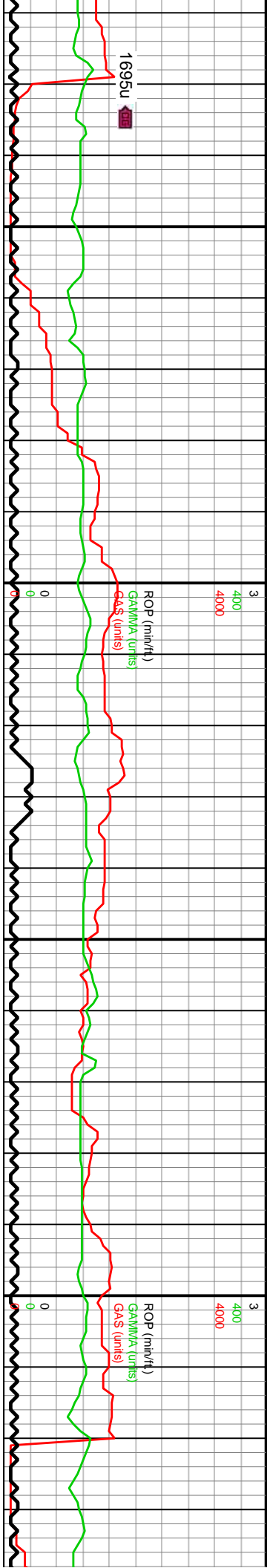




WOB: 36Klbs
Rotary: 61RPM
Strokes: 212SPM
Pump Rate: 653GPM

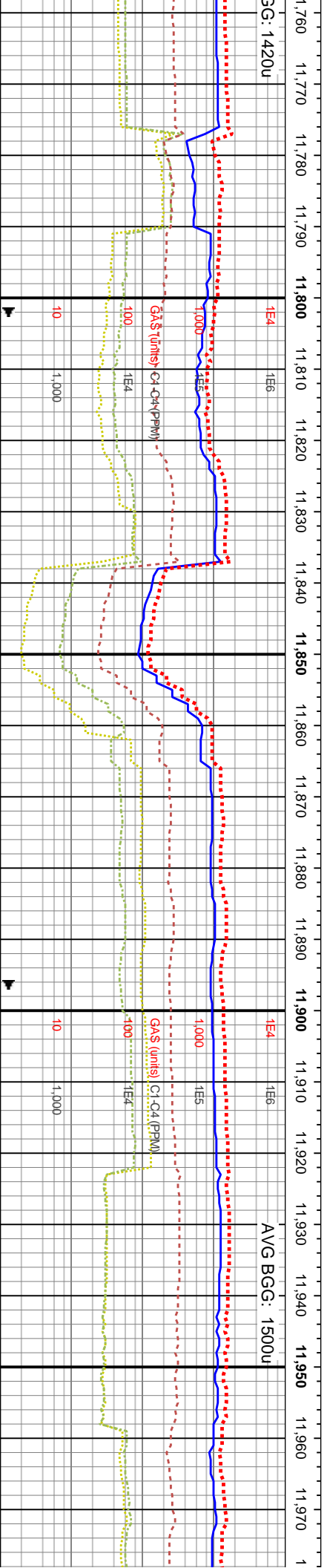
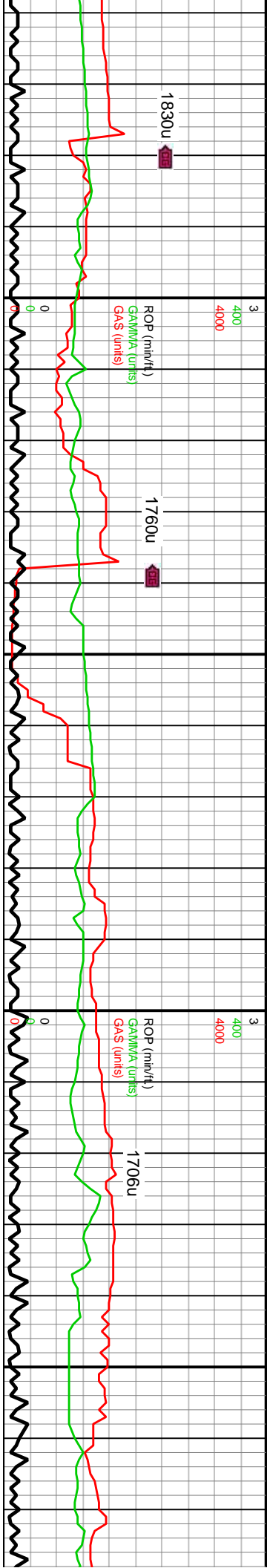
MD: 11,171'
TVD: 7,545.11'
Inclination: 89.23°
Azimuth: 180.77°
VS: 3,168.12'

MD: 11,266'
TVD: 7,546.22'
Inclination: 89.43°
Azimuth: 179.82°
VS: 3,263.11'



S: gy-gy brn, com off wh-it gy intbds, rd-rd sd grs, frm sli fri gr sup clus, arg ip, tr vf pyr, non calc-sl calc ip, ST: v dk gy-blk, mod w strd grs, silc sdy intbds, tr vf pyr, non calc		11360-11420 SS: pred gy-gy brn, occ off wh-it gy intbds, mod strd vf-f sb rd-rd sd grs, frm sli fri gr sup clus cons wi pred silc cnt, arg ip, tr vf pyr, non calc-sl calc ip, wi rr intbdd SLTST: v dk gy-blk, mod w strd grs, silc cnt, occ vf-f gr sdy intbds, tr vf pyr, non calc	8400
S: gy-gy brn, com off wh-it gy intbds, rd-rd sd grs, frm sli fri gr sup clus, arg ip, tr vf pyr, non calc-sl calc ip, ST: v dk gy-blk, mod w strd grs, silc sdy intbds, tr vf pyr, non calc		11420-11480 SS: gy-gy brn, com off wh-it gy intbds, mod strd vf-f sb rd-rd sd grs, frm sli fri gr sup clus cons wi silc cnt, arg ip, tr vf pyr, non calc-sl calc ip, wi rr intbdd SLTST: v dk gy-blk, mod w strd grs, silc cnt, occ vf-f gr sdy intbds, tr vf pyr, non calc	8400
S: gy-gy brn, com off wh-it gy intbds, rd-rd sd grs, frm sli fri gr sup clus, arg ip, tr vf pyr, non calc-sl calc ip, ST: v dk gy-blk, mod w strd grs, silc sdy intbds, tr vf pyr, non calc		11480-11540 SS: pred gy-gy brn wi o stn, occ off wh-it gy intbds, mod strd vf-f sb rd-rd sd grs, frm sli fri gr sup clus cons wi pred silc cnt, arg ip, tr vf pyr, non calc-sl calc ip, wi rr intbdd SLTST: v dk gy-blk, mod w strd grs, silc cnt, occ vf-f gr sdy intbds, tr vf pyr, non calc	8400





WOB: 40Klbs
Rotary: 60RPM
Strokes: 212SPM
Pump Rate: 653GPM

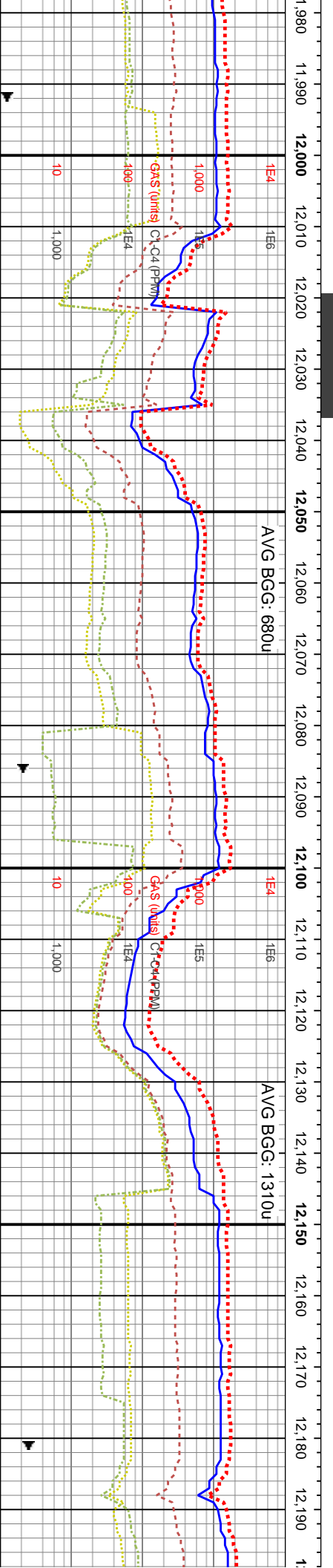
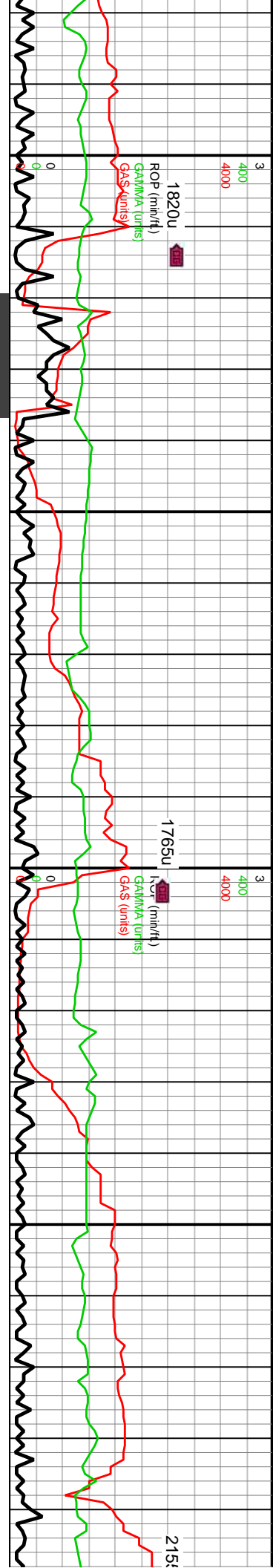
MD: 11,836'
TVD: 7,548.98'
Inclination: 89.36°
Azimuth: 179.88°
VS: 3,833.04'

DP @ 11,900'

MD: 11,932'
TVD: 7,549.37'
Inclination: 90.17°
Azimuth: 180°
VS: 3,929.04'

brn wi o stn, occ off	11780-11840 SS: pred gy-gy brn wi o stn, occ off	11840-11900 SS: pred gy-gy brn wi o stn, occ off	11900-11960 SS: pred in- gy- med gy brn, sme	11960-12000 SS: pred in- gy- med gy, al
sb rd-rd sd grs, frm	wh-it gy intbds, mod strd vf-f sb rd-rd sd grs, frm	off wh-it gy intbds, mod strd vf-f sb rd-rd sd grs, frm	med gy, abnt sl- mod trnsi grs, pred sb blk, frm-	med gy, al
silic cnt, arg ip, tr	sil fri gr sup clus cons wi pred silic cnt, arg ip, tr vf	frm sil fri gr sup clus cons wi pred silic cnt, arg	fr clus, ip hd clus, pred v f- f grd cons sd, pred sb	fr clus, ip t
tr intbdd SLTST: v	pyr, non calc-sil calc ip, wi rr intbdd SLTST: v dk	ip, tr vf pyr, non calc-sil calc ip, wi rr intbdd	rnd- ang grs, ip uncong ang- sb ang grs, arg- sil	rnd- ang g
c cnt, occ vf-f gr sdy	gy-blk, mod w strd grs, silic cnt, occ vf-f gr sdy	SLTST: v dk gy-blk, mod w strd grs, silic cnt, occ vf-f gr sdy	cmt thru, ip mod calc, sl stly, sme lse sil- ang cnt,	cmt thru, ip
	intbds, tr vf pyr, non calc	occ vf-f gr sdy intbds, tr vf pyr, non calc	8400 tr pyr, abnt lith frags	cmt, tr pyr,





WOB: 28Klbs
Rotary: 61RPM
Strokes: 213SPM
Pump Rate: 653GPM

WOB: 38Klbs
Rotary: 60RPM
Strokes: 213SPM
Pump Rate: 655GPM

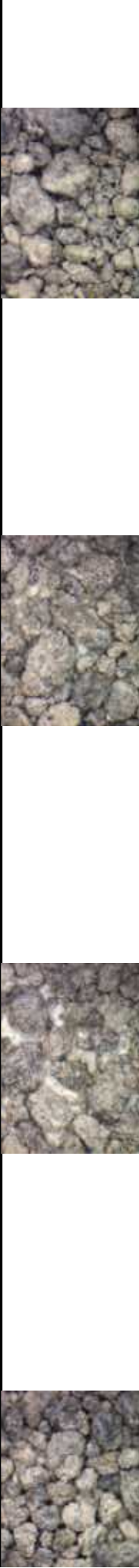
MD: 12,027'
TVD: 7,549.77'
Inclination: 89.36°
Azimuth: 179.47°
VS: 4,020.85'

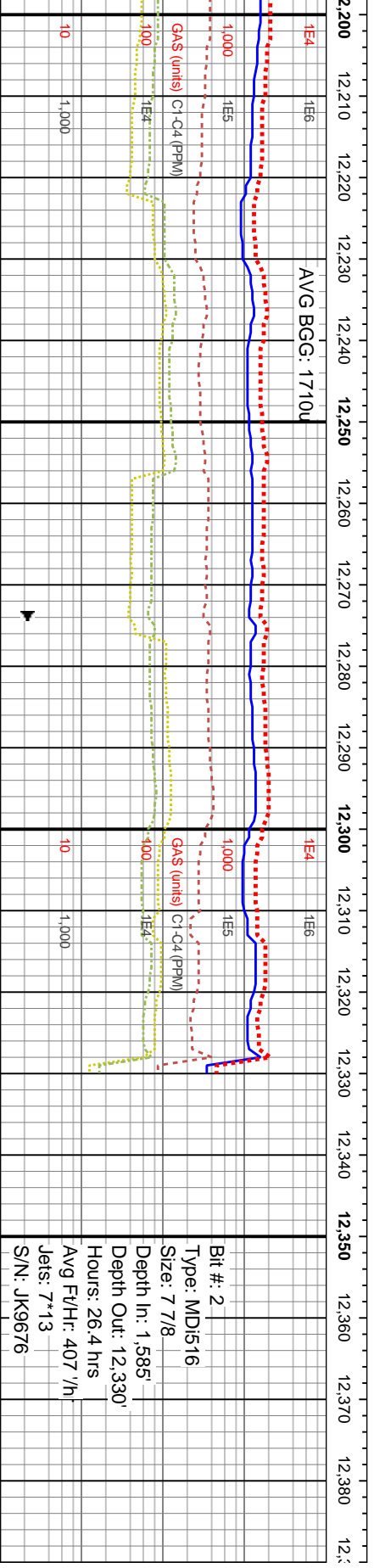
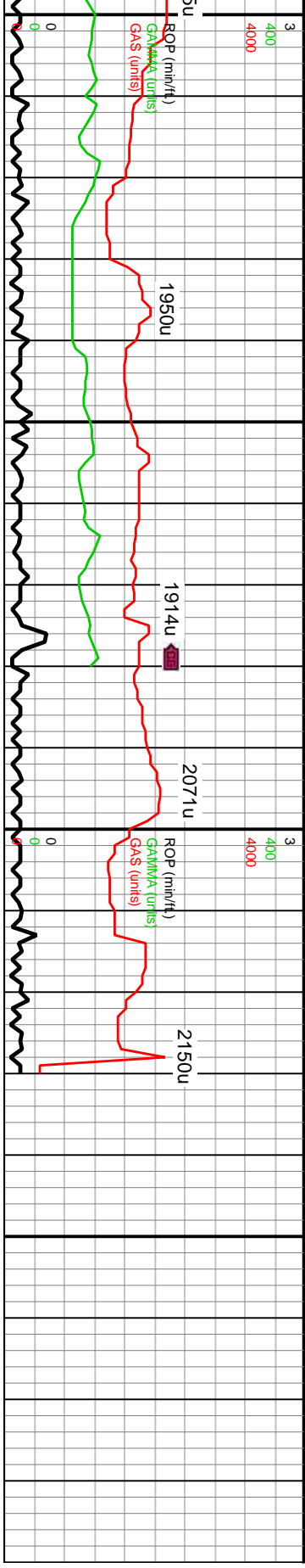
MD: 12,122'
TVD: 7,550.67'
Inclination: 89.56°
Azimuth: 179.08°
VS: 4,115.83'

12020-12080 SS: pred tn- gy- med gy brn, sme sl dk gy, abnt sl- mod trnsi grs, pred sb blkly, frm-clus, ip hd clus, pred v f- f grd cons sd, pred sb ang grs, ip uncong ang- sb ang grs, arg- sil ip mod calc, sl silty, sme lse sil- arg lith frags

12080-12140 SS: pred tn- gy- med gy brn, sme med- sl dk gy, abnt sl- mod trnsi grs, pred sb blkly, frm- fr clus, ip hd clus, pred v f- f grd cons sd, pred sb rnc- ang grs, ip uncong ang- sb ang grs, arg- sil cnt thru, ip mod calc, sl silty, sme lse sil- arg cnt, tr pyr, abnt lith frags

12140-12200 SS: pred tn- gy- med gy brn, sme med- sl dk gy, abnt sl- mod trnsi grs, pred sb blkly, frm- fr clus, ip hd clus, pred v f- f grd cons sd, pred sb rnc- ang grs, ip uncong ang- sb ang grs, arg- sil cnt thru, ip mod calc, sl silty, sme lse sil- arg cnt, tr pyr, abnt lith frags





6400	MD: 12,216' TVD: 7,550.64' Inclination: 90.47° Azimuth: 178.25° TVD (VS): 4,209.81'	MD: 12,270' TVD: 7,549.98' Inclination: 90.94° Azimuth: 178.3° VS: 4,263.78'	MD: 12,330' TVD: 7,548.99' Inclination: 90.94° Azimuth: 178.3° VS: 4,323.74'	TD Reached on 1-28-16
12200-12260 SS: pred tn- gy- med gy brn, sme med- sl dk gy, abnt sl- mod trnsl grs, pred sb blk, frm- fr clus, ip hd clus, pred v f- f grd cons sd, pred sb md- ang grs, ip uncongs ang- sb ang grs, arg- sil cnt thru, ip mod calc, sl stly, sme lse sil- arg cnt, tr pyr, abnt lith frags				
12260-12330 SS: pred tn- gy- med gy brn, sme med- sl dk gy, abnt sl- mod trnsl grs, pred sb blk, frm- fr clus, ip hd clus, pred v f- f grd cons sd, pred sb md- ang grs, ip uncongs ang- sb ang grs, arg- sil cnt thru, ip mod calc, sl stly, sme lse sil- arg cnt, tr pyr, abnt lith frags				

