



Empirica

Scale: 5" / 100'
Measured Depth Log

Well Name DT Forbes c6-5-6

Location Sec.5-T05N-R65W

State Colorado

Country USA

API Number NA

Region DJ Basin

Spud Date 10/8/2015

Surface Coordinates Lat: 40.43514
Long: 40.43514

Bottom Hole Coordinates NA

County Weld

Rig Number Patterson UTI 346

Field Wattenberg

Drilling Completed 10/12/2015

Ground Elevation 4,640'

K.B. Elevation 4,664.5'

Logged Interval 7,160' To 15,244'

Total Depth 15,244'

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: 10-8-15
Standby: NA
TD: 10-12-15

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

CORAL

CEPHALOPOD

CRINOID

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)

SIDEAWA

Porosity

E EARTHY

F FENESTRAL

F FRACTURE

CONNECTION GAS

SLIDE

SURV

INTERCRYSTALLINE

CORE - RECOVERED

TRIP C

INTEROOLITIC

DST INTERVAL

WIRELIN

MOLDIC

FAULT

WIRELIN

Symbols

FORMATION TOP L LITHOGRAPHIC

Rounding

LOW MX MICROXLN

MIN DEPTH AN ANGULAR MS MUDSTONE

FL FAULT R ROUNDED PS PACKSTONE

DW B SUBANG WS WACKESTONE

TURNED STRATA N SUBRND

Sorting

SE FAULT

Textures

LL CORE (LEFT) M MODERATE

LL CORE (RIGHT) BS BOUNDSTONE P POOR

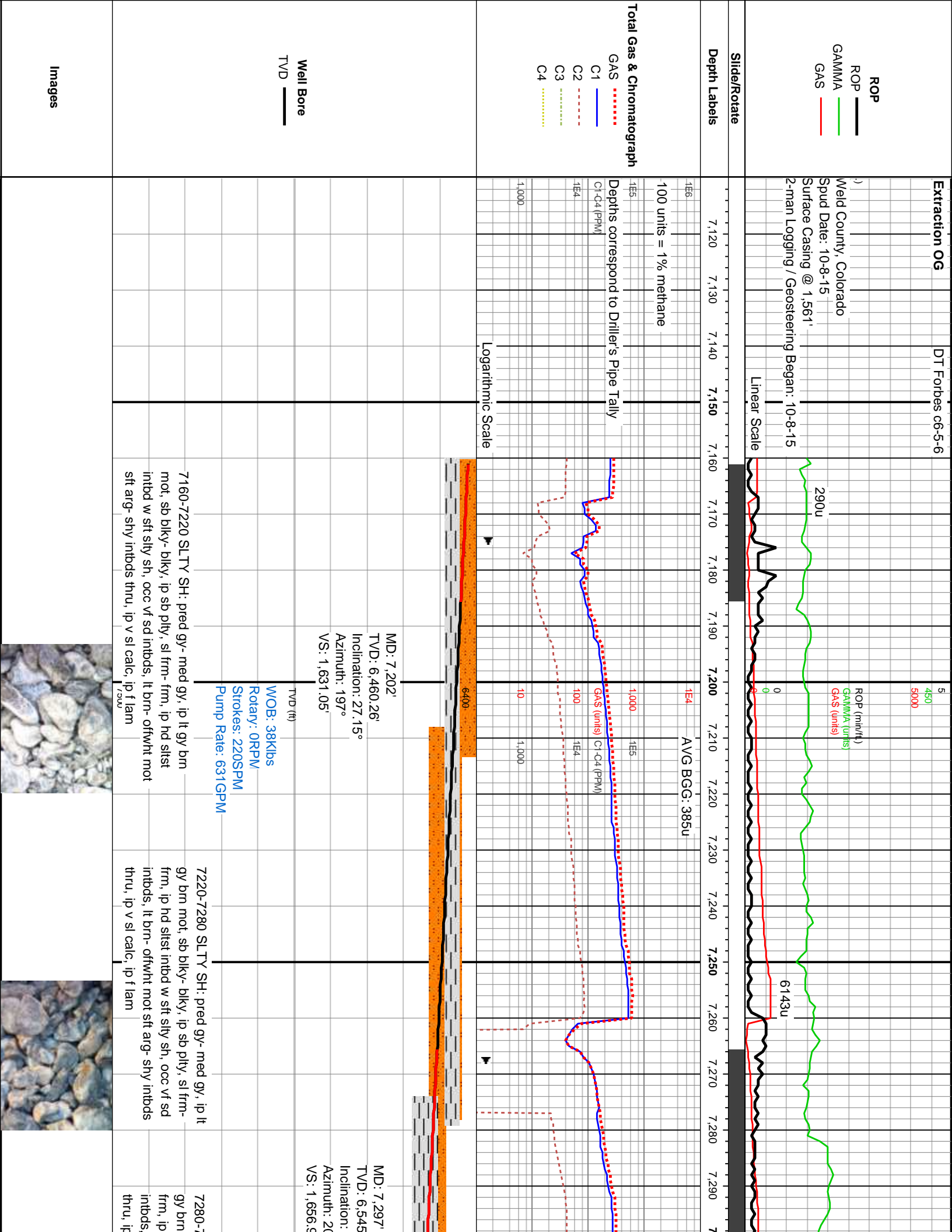
C CHALKY W WELL

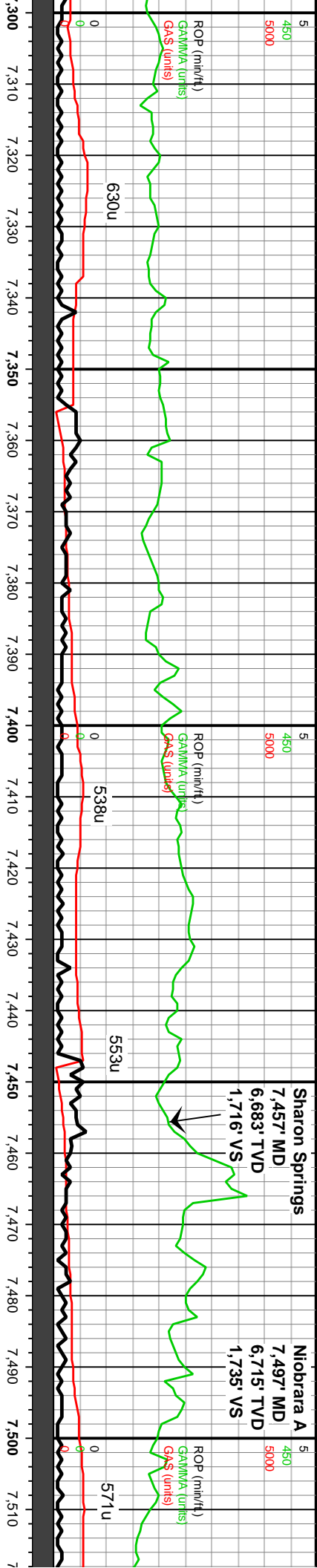
QX CRYPTOXLN

E EARTHY

IE TESTED - LEFT FX FINELYXLN

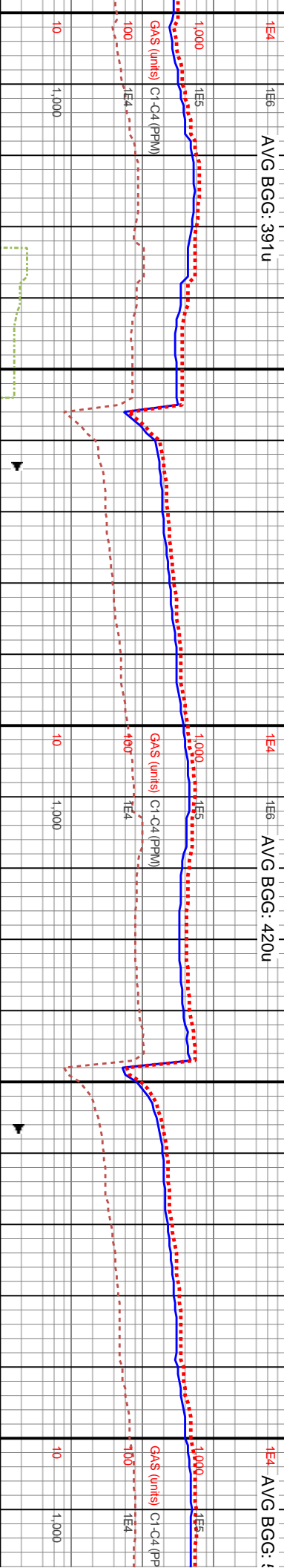
IE TESTED - RT GS GRAINSTONE





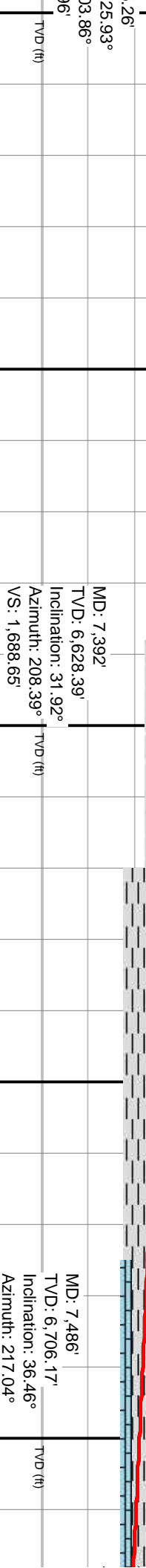
Sharon Springs
7,457' MD
6,683' TVD
1,716' VS

Niobrara A
7,497' MD
6,715' TVD
1,735' VS



WOB: 37Klbs
Rotary: 0RPM
Strokes: 220SPM
Pump Rate: 631GPM

NW @ 7,460'



MD: 7,486'
TVD: 6,706.17'
Inclination: 36.46°
Azimuth: 217.04°
VS: 1,729.19'

TVD (ft)

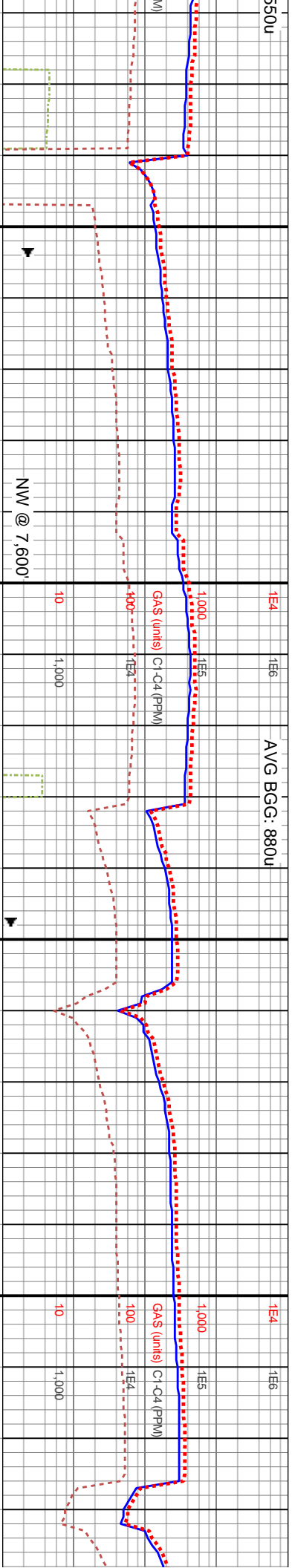
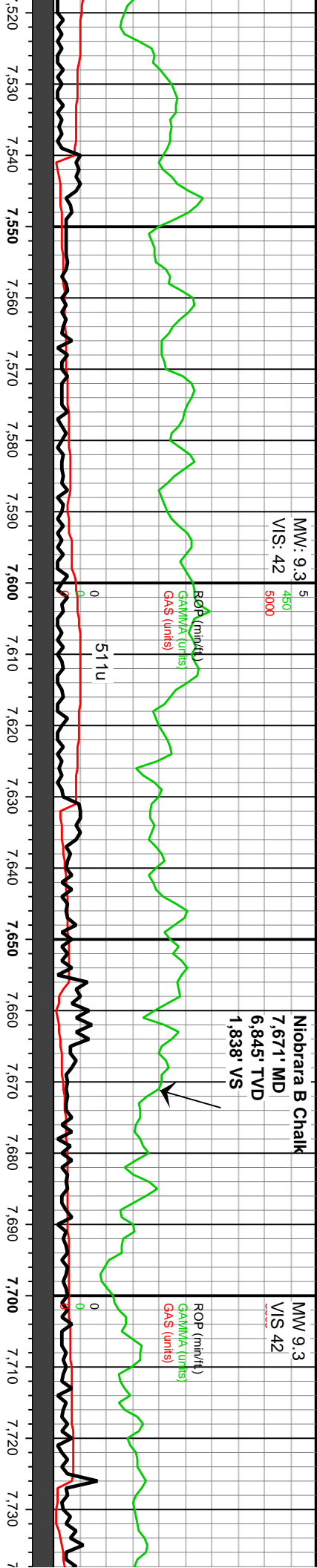
340 SLTY SH: pred gy- med gy, ip lt
mot, sb blk- blk, ip sb ply, sl frm-
hd slst intbd w sft slty sh, occ vf sd
lt brn- offwht mot sft arg- shy intbds
v sl calc, ip f lam

7340-7400 SLTY SH: pred med gy, sme
brn mot, sb blk, ip sb ply, sl frm- frm, ip
hd slst intbds, occ chky intbds, sme cal,
sl calc, ip f lam

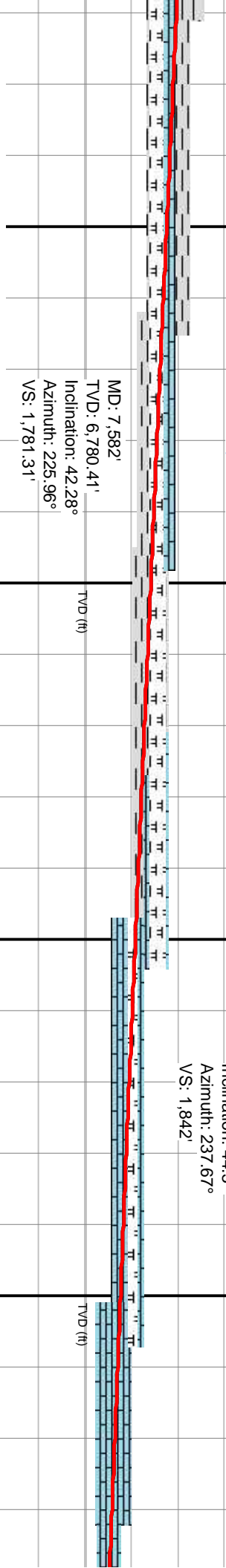
7400-7460 SLTY SH: pred med gy, sme
brn mot, sb blk, ip sb ply, sl frm- frm, ip
hd slst intbds, occ chky intbds, sme cal, sl
calc, ip f lam

7460-7520 80% CHK: lt gy-gy-occ dk gy med frm-frm
l-mod fls sb ang-sb blk cigs, slty-chky tex, occ mrl
incl & occ mrlst intbds, hi calc w/ cin HCL rxn, w/ 20%
-MRLST: gy-dk gy, frm mod fls cigs, tr bent, tr vf pyr,
quick brn HCL rxn





WOB: 48Klbs
Rotary: 0RPM
Strokes: 220SPM
Pump Rate: 632GPM



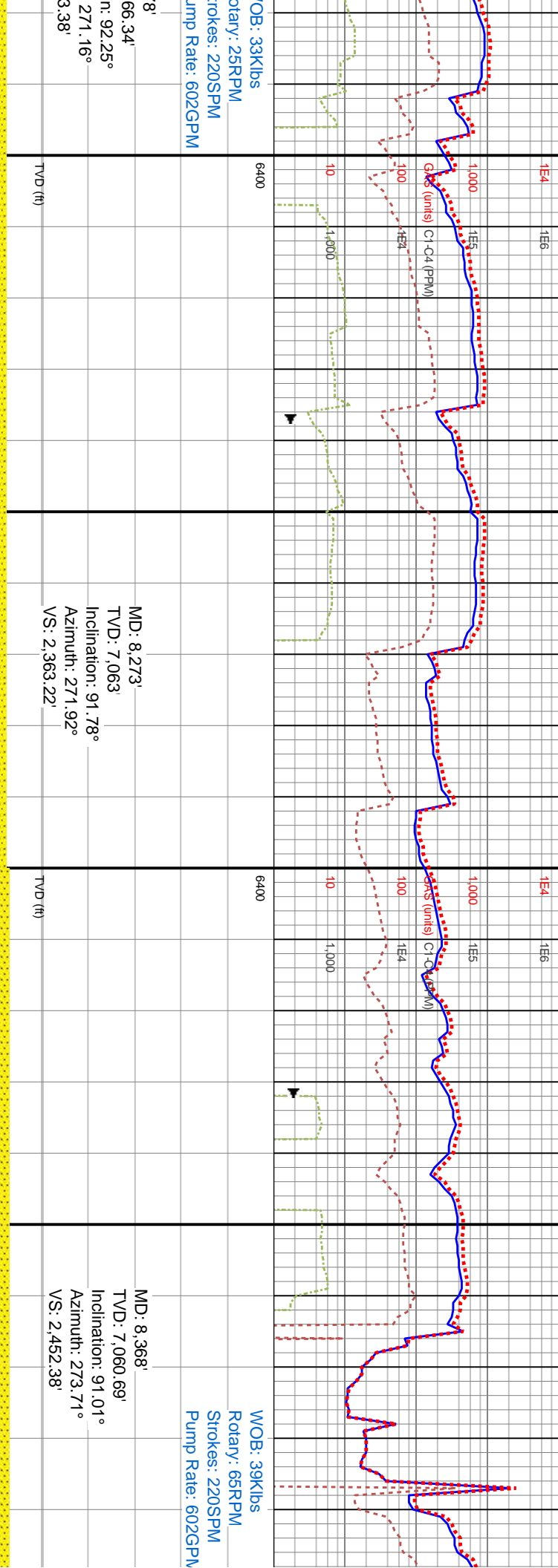
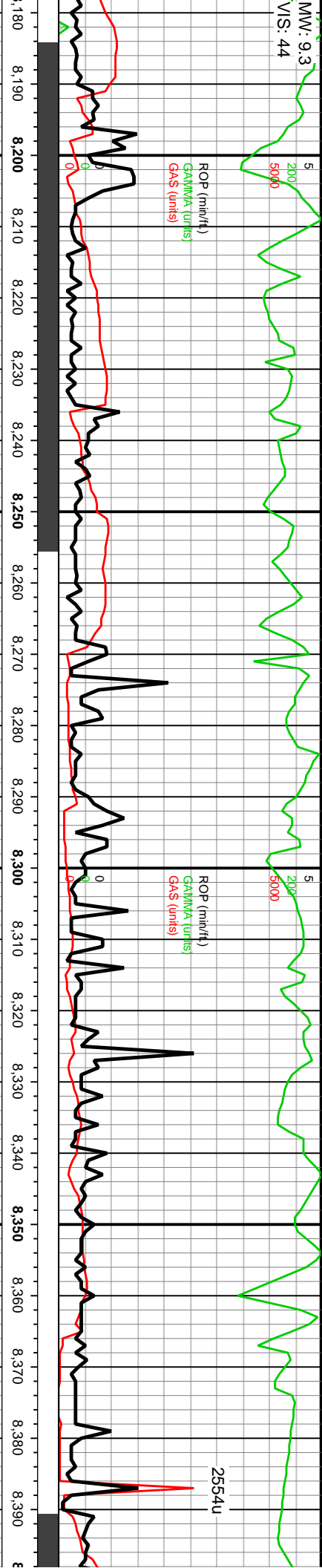
7520-7560 70% CHK: It gy-gy-occ dk gy med
firm-firm l-mod fls sb ang-sb biky cigs, silty-chky tex,
occ mnty incl & occ mntst inbds, tr bent, tr vf pyr, hi
calc wi cln HCL rxn, wi inbddd MRLST (30%): gy-dk
gy, firm mod fls cigs, tr vf pyr, mod calc wi quick brn
HCL rxn

7560-7640 60% CH₃: pred lt gy-gy, occ dk gy med
firm-firm l-mod fis sb ang-sb biky cigs, silty-cinky tex,
occ mly incl & occ mlist inbds, tr bent, tr vt pyr, hi
calc wi cln HCL rxn, wi 40% MRLST: gy-dk gy, meec
firm-firm, mod fis sb rd-sb biky cigs, tr vt pyr, mod
calc wi quick brn HCL rxn

7640-7700 CHK (90%): It gy-gy-occ dk gy, med
frm-frm, mod fis sb biky-sb ang-sb rd cigs, silty-chky
tex, occ mny inci & occ mlst inbds, tr bent, occ free
chk wi u-f-c-ehd pyr, tr vf pyr, hi calc wi cln HCL rxn,
MRLST (10%): gy-dk gy, frm mod fis cigs, tr vf pyr,
mod calc wi quick brn HCL rxn

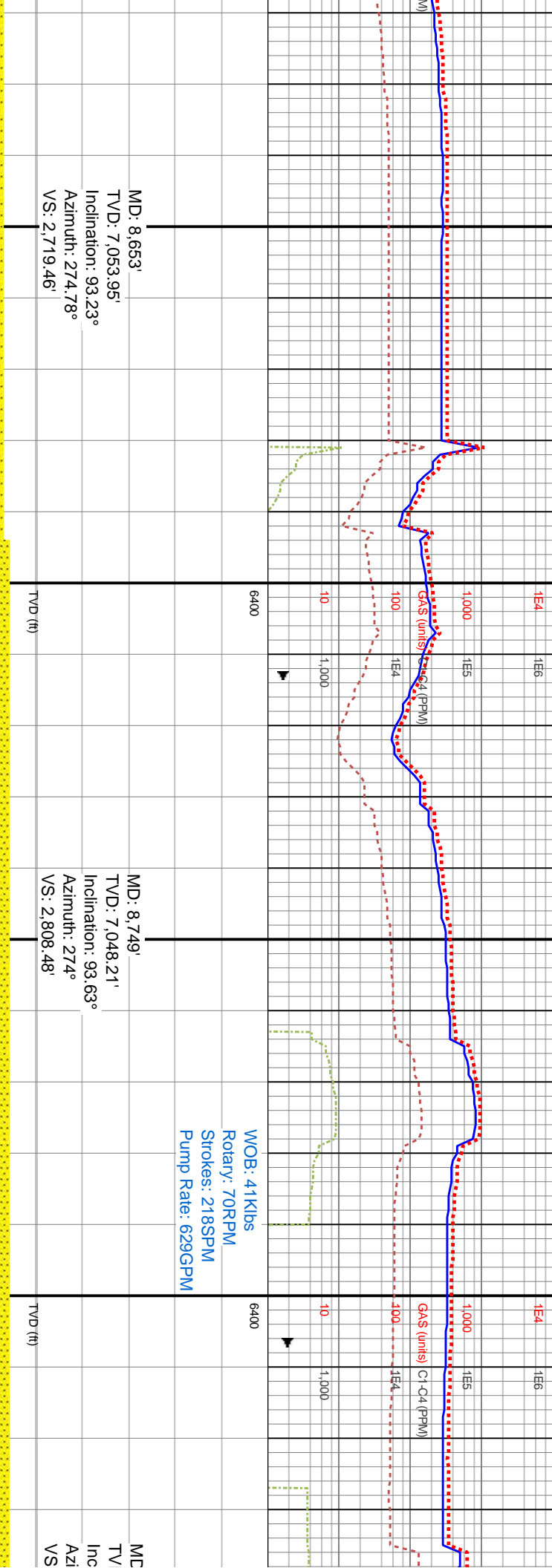
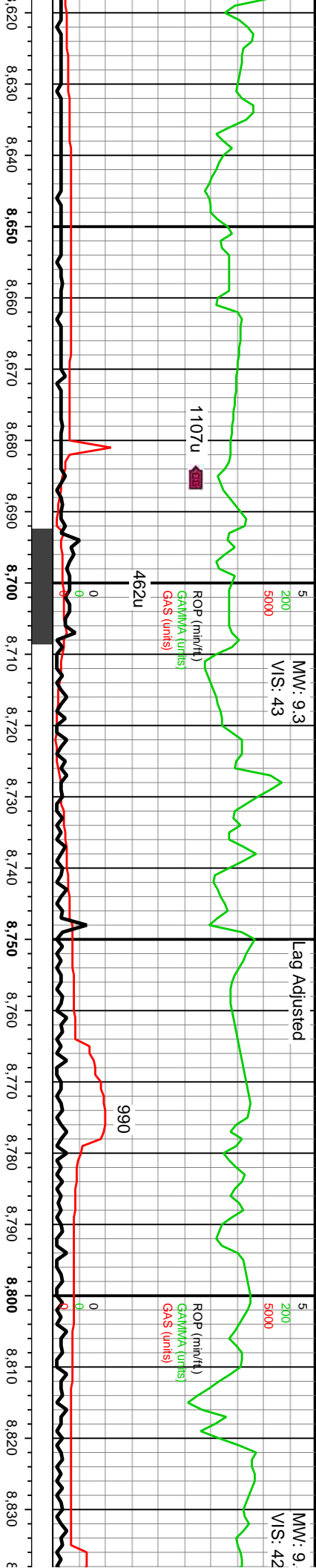
7700-7820	80% CHK: pred off wt	
	bkly v arg LS ctgs, silty-chky tex, (
	pyr, hi calc wi chn HCL rxn, MRLS	
rxn		








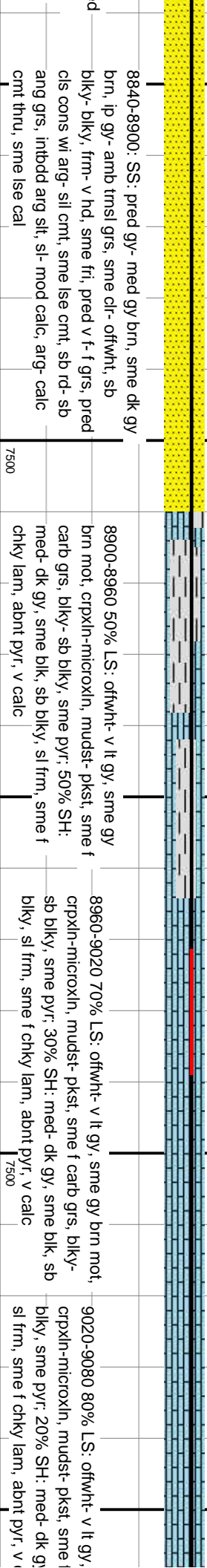
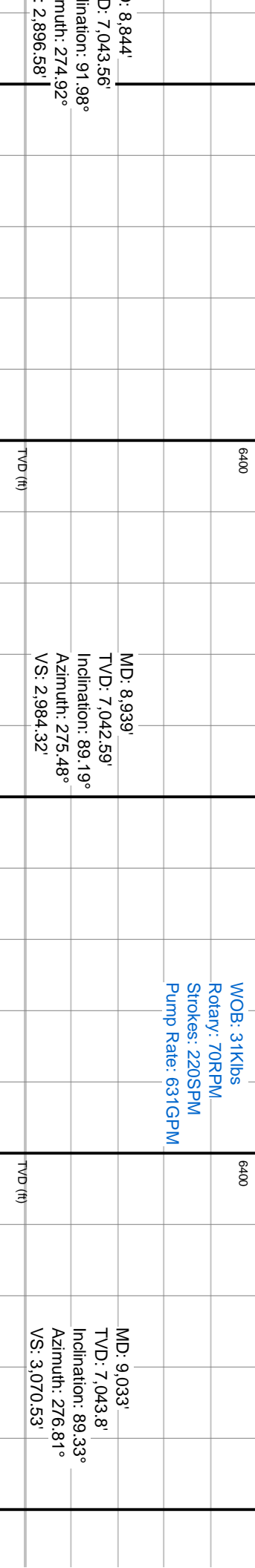
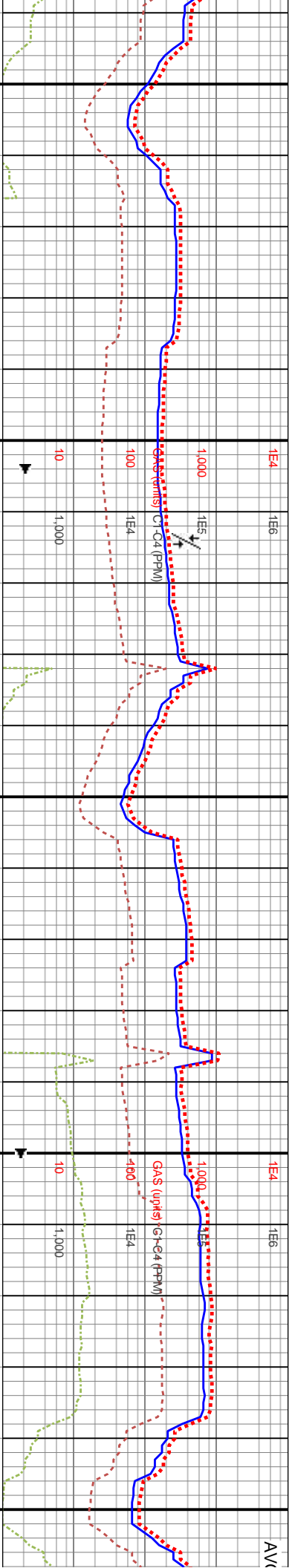
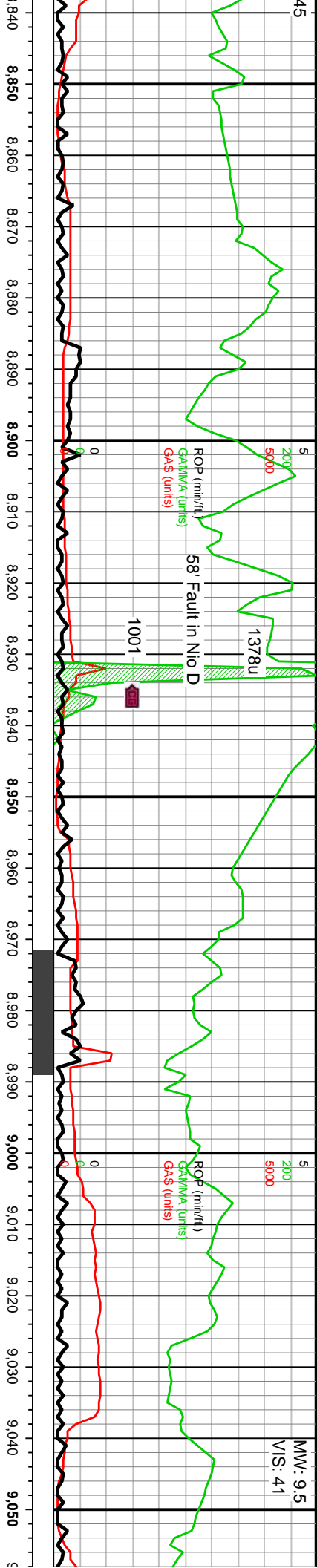
8180-8240: 70% SS: pred gy- med gy brn, dk gy, ip gy tmsl grs- offwht, sb blkly- blkly, sl frm- v hd, pred v f- f grs, pred cls cons wi arg- sil cnt, sb rd- sb ang grs, abnt intbdd arg slit, sl- mod calc, arg- calc cnt thru, lse cal: 30 SLTY SH: pred v dk gy- blk, occ med gy, frm- hd, blkly, sl calc, sme f lam, tr pyr	8240-8300: 70% SS: pred gy- med gy brn, dk gy, ip gy tmsl grs- offwht, sb blkly- blkly, sl frm- v hd, pred v f- f grs, pred cls cons wi arg- sil cnt, sb rd- sb ang grs, abnt intbdd arg slit, sl- mod calc, arg- calc cnt thru, lse cal: 30 SLTY SH: pred v dk gy- blk, occ med gy, frm- hd, blkly, sl calc, sme f lam, tr pyr	8300-8360: 70% SS: pred gy- med gy brn, dk gy, ip tmsl grs- offwht, sb blkly- blkly, sl frm- v hd, pred v f- f grs, pred cls cons wi arg- sil cnt, sb rd- sb ang grs, abnt intbdd arg slit, sl- mod calc, arg- calc cnt thru, lse cal: 30% SLTY SH: pred v dk gy- blk, occ med gy, frm- hd, blkly, sl calc, sme f lam, tr pyr	8360-8420: 60% SS: pred gy- me gy tmsl grs- offwht, sb blkly- blkly, f- f grs, pred cls cons wi arg- sil c grs, abnt intbdd arg slit, sl- mod c thru, lse cal: 40% SLTY SH: pred med gy, frm- hd, blkly, sl calc, sm
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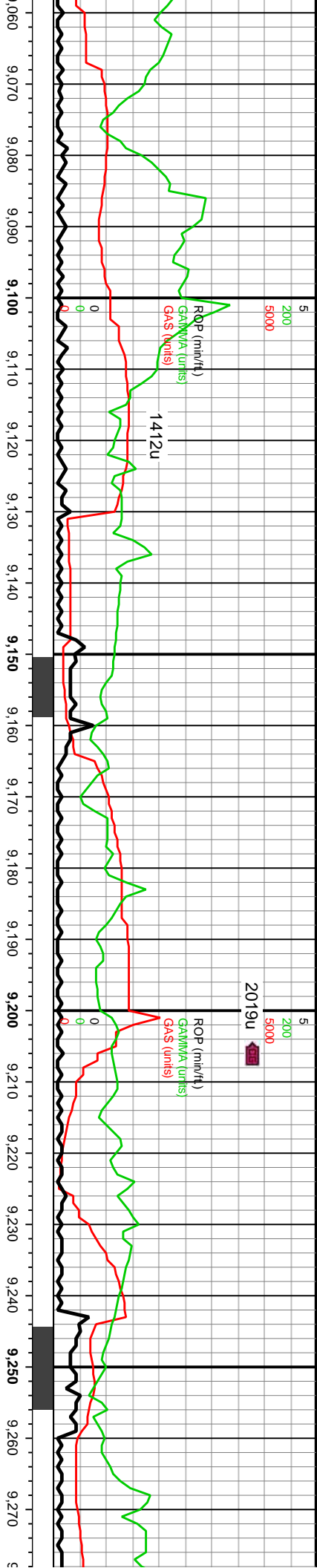




0% SS: pred gy- med gy brn, sme dk	8660-8720: SS: pred gy- med gy brn, sme dk gy brn, ip gy- amb trnsi grs, sme clr- offwht, sb ip gy- amb trnsi grs, sme blk- blkly, frm- v hd, sme fri, pred v f- f grs, pred arg- sil cnt, sme lse cnt, sb rd- sb ang grs, sme arg- sil cnt, sme lse cnt, sb rd- sb ang grs, inbddd arg slit, sl- mod calc, arg- calc cnt thru, sme lse cal	8720-8780: SS: pred gy- med gy brn, sme dk gy brn, ip gy- amb trnsi grs, sme clr- offwht, sb blkly- blkly, frm- v hd, sme fri, pred v f- f grs, pred ds cons wi arg- sil cnt, sme lse cnt, sb rd- sb ang grs, inbddd arg slit, sl- mod calc, arg- calc cnt thru, sme lse cal	8780-8840: SS: pred gy- med gy brn, sme dk gy brn, ip gy- amb trnsi grs, sme clr- offwht, sb blkly- blkly, frm- v hd, sme fri, pred v f- f grs, pred ds cons wi arg- sil cnt, sme lse cnt, sb rd- sb ang grs, inbddd arg slit, sl- mod calc, arg- calc cnt thru, sme lse cal
inbddd sd, sme f lam, tr pyr	7500	7500	7300







3 BGG: 440u



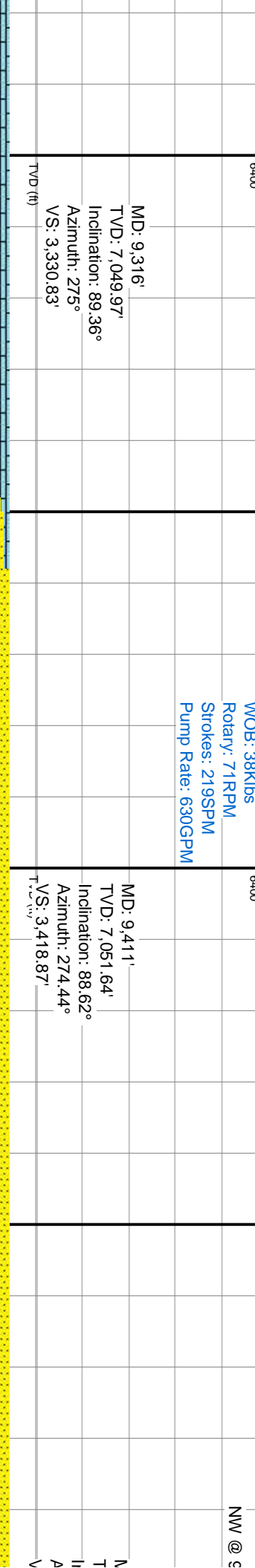
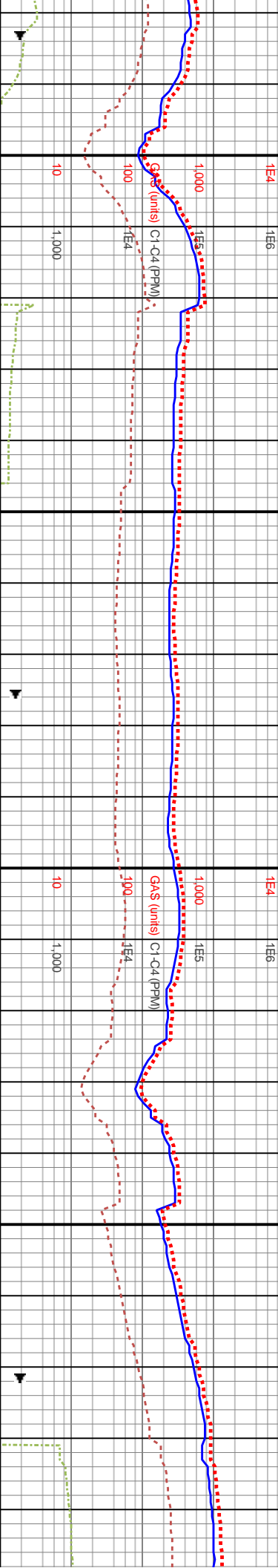
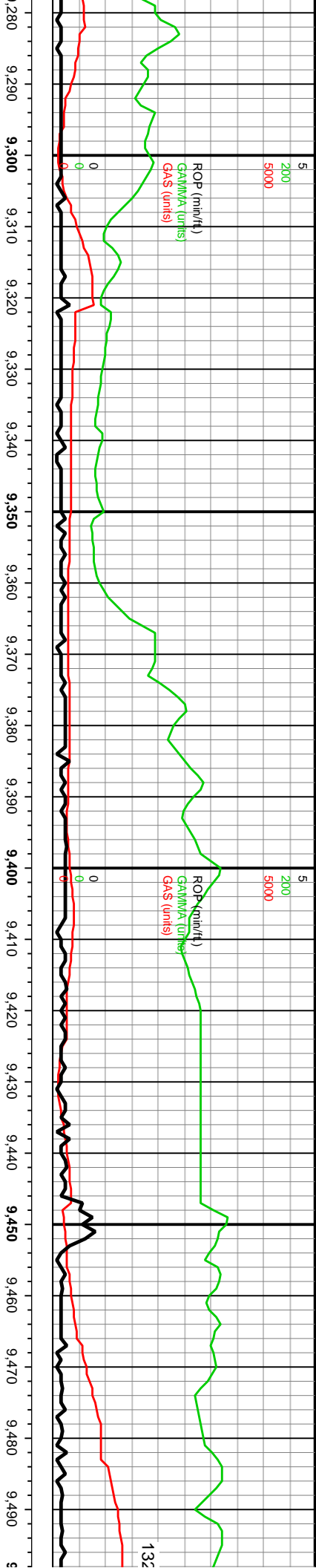
MD: 9,127'
TVD: 7,046.39'
Inclination: 87.52°
Azimuth: 275.92°
VS: 3,156.57'

WOB: 35Klbs
Rotary: 71RPM
Strokes: 219SPM
Pump Rate: 630GPM

MD: 9,222'
TVD: 7,048.95'
Inclination: 89.4°
Azimuth: 275.36°
VS: 3,244'

sme gy brn mot ip, carb grs, blkly- sb	9080-9140 75% LS: offwht- v lt gy, sme gy brn mot ip, cpplx-microxln, mudst- pkst, sme f carb grs, blkly- sb blkly, sme pyr; 25% SH: med- dk gy, sme blk, sb blkly, sl frm, sme f chky lam, abnt pyr, v calc	9140-9200 85% LS: offwht- v lt gy, cpplx-microxln, mudst- pkst, sme f carb grs, blkly- sb blkly, sme pyr; 15% SH: pred med- dk gy, sme blk ip, sb blkly, sl frm, sme f chky lam, abnt pyr, v calc	9200-9260 90% LS: offwht- v lt gy, sme gy brn mot ip, cpplx-microxln, mudst- pkst, sme f carb grs, blkly- sb blkly, sme pyr; 10% SH: med- dk gy, sme blk, sb blkly, sl frm, sme f chky lam, abnt pyr, v calc	9260-9320 75% LS: offwht- v lt gy, sme gy brn mot ip, cpplx-microxln, mudst- pkst, sme f carb grs, blkly- sb blkly, sme pyr; 10% SH: med- dk gy, sme blk, sb blkly, sl frm, sme f chky lam, abnt pyr, v calc
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MD: 9,316'
TVD: 7,049.97'
Inclination: 89.36°
Azimuth: 275°
VS: 3,330.83'

WOB: 38Klbs
Rotary: 71RPM
Strokes: 219SPM
Pump Rate: 630GPM

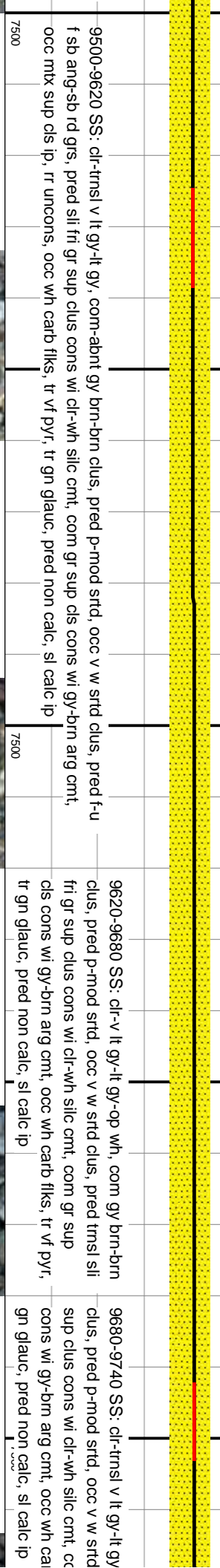
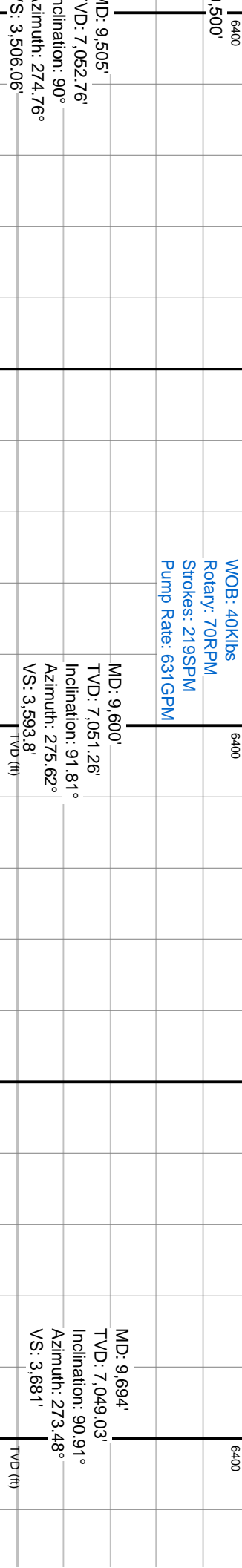
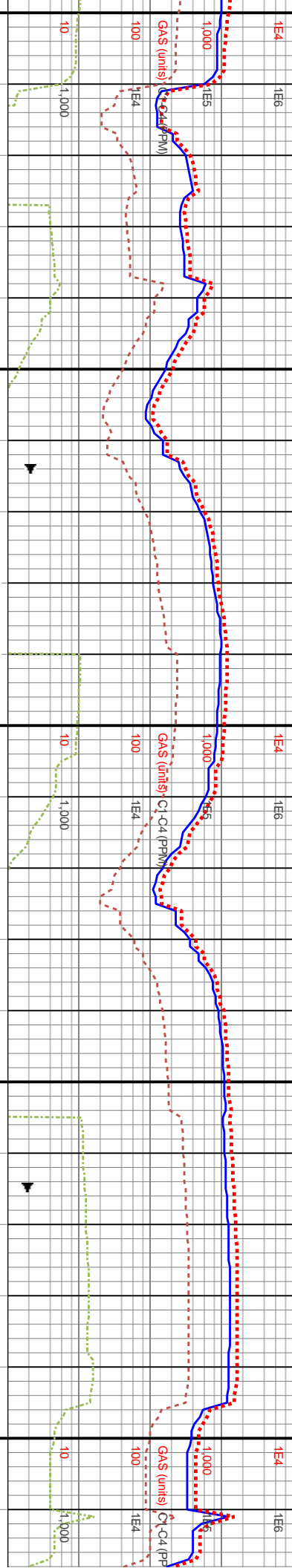
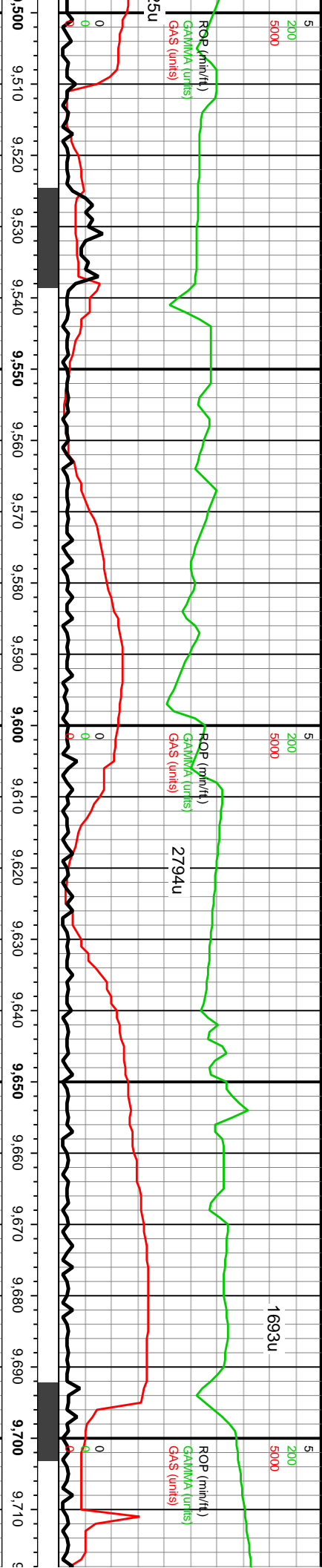
MD: 9,411'
TVD: 7,051.64'
Inclination: 88.62°
Azimuth: 274.44°
VS: 3,418.87'

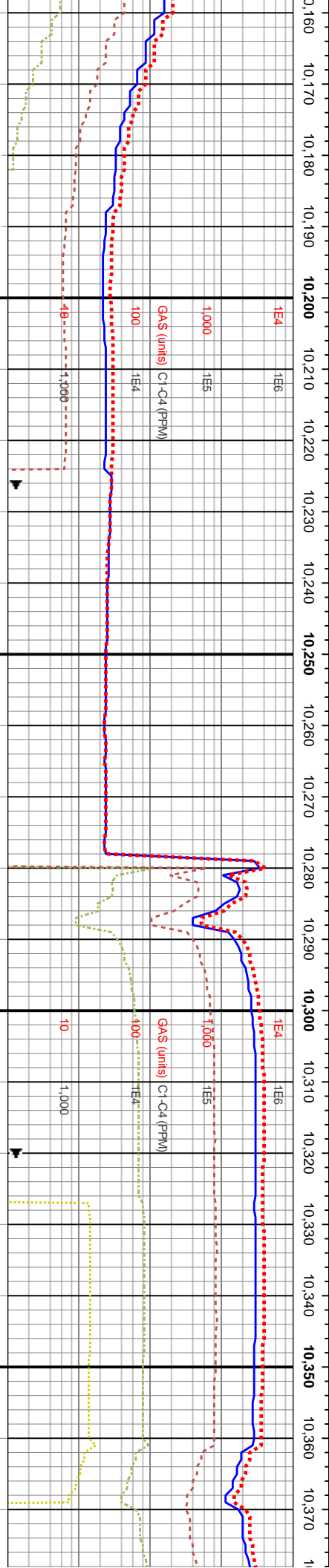
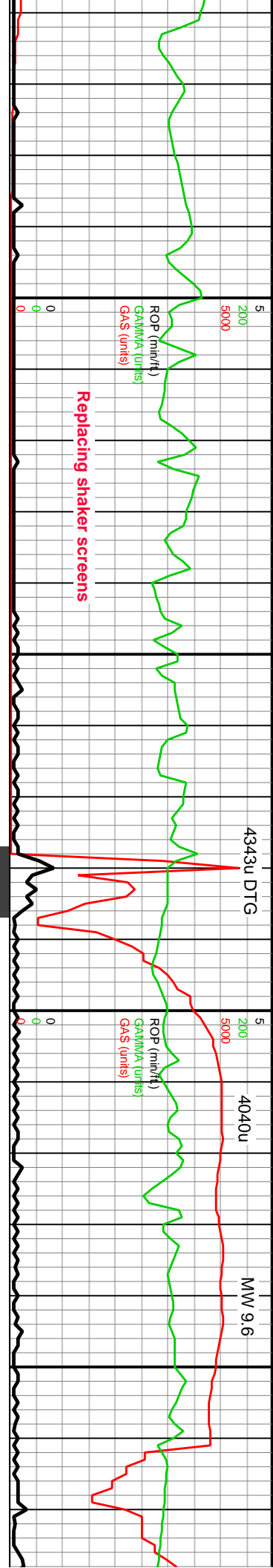
LS: offwh- v lt gy, sme gy brn mot
ln, mudst- pks, sme f carb grs, blk-
; 25% SH: med- dk gy, sme blk, sb
f chky lam, abnt pyr, v calc

9320-9440 70% LS: offwh- v lt gy, smy gy brn mot, crpxln-microxln, mudst- pks, sme f carb grs, blk- sb
blky cigs, tr pyr, 30% SS: gy- gy brn, sme dk gy brn, ip gy- amb tmsl grs, sme clr- offwh, sb blk- blk, frm-
v hd, sme frl, pred v f- f grs, pred cls cons wi arg- sil cnt, sme lse cnt, sb rd- sb ang grs, inbddd arg slit,
sl- mod calc, arg- calc cnt thru, sme lse cal

9440-9500 SS: clr-tmsl v lt gy-lt gy, com gy brn-brn
clus, pred p-mod strd, occ v w strd clus, pred sil frt gr
sup clus cons wi clr-wh silic cnt, com gr sup cls cons
wi gy-brn arg cnt, occ wh carb flks, tr vf pyr, tr gn
glau, pred non calc, sl calc ip







WOB: 46Klbs
Rotary: 70RPM
Strokes: 218SPM
Pump Rate: 629GPM

MD: 10,166'
TVD: 7,045.65'
Inclination: 90.5°
Azimuth: 273.77°
VS: 4,123.86'

MD: 10,261'
TVD: 7,044.48'
Inclination: 90.91°
Azimuth: 273.48°
VS: 4,212.58'

MD: 10,365'
TVD: 7,043.95'
Inclination: 89.73°
Azimuth: 274.48°
VS: 4,300.15'

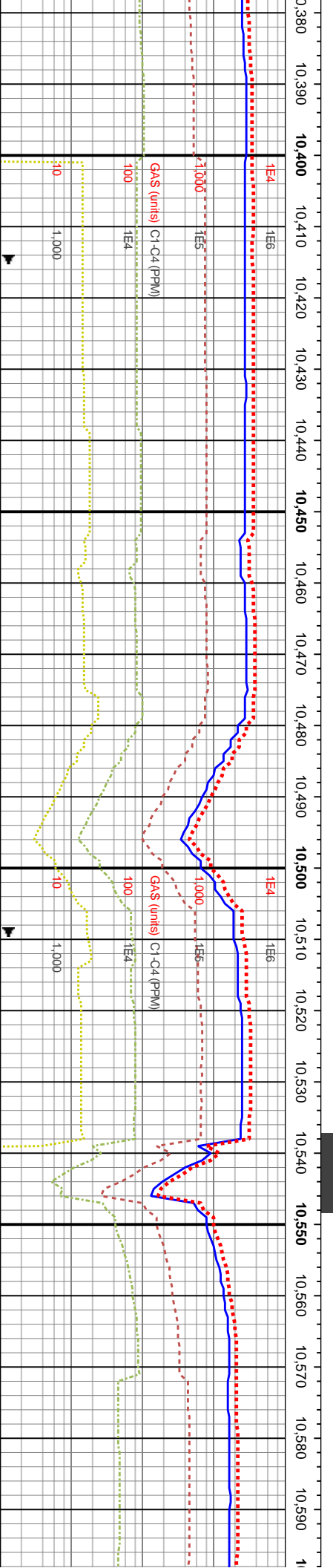
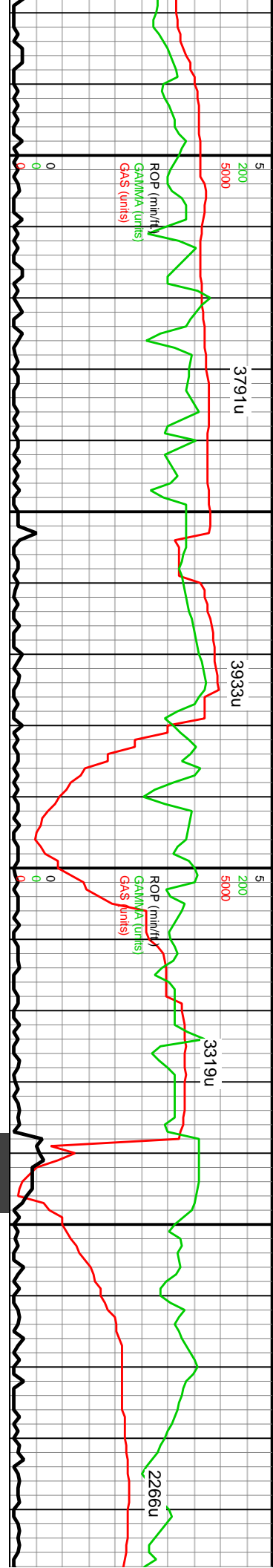
10160-10220 SS: off wh-it gy-gy, rr dk gy, mod strd, pred f-u f sb ang-sb rd grs, pred sill fri rd gr sup clus cons wi clr-wh silic cnt, dolc ip, com wh carb flks, tr vf pyr, pred non calc, sl calc ip

10220-10280 SS: off wh-it gy-gy, rr dk gy, p-mod strd, pred f-u f sb ang-sb rd grs, sill fri rd gr sup clus cons wi clr-wh silic cnt, wh dolc cnt intbds ip, arg ip, com wh carb flks, pred non calc, sl calc ip

10280-10340 SS: pred lt gy-gy, occ off wh, rr dk gy, p-mod strd f-u f sb ang-sb rd grs, sill fri rd gr sup clus cons wi clr-wh silic cnt, wh dolc cnt intbds ip, arg ip, com wh carb flks, pred non calc, sl calc ip

10340-10440 SS: pred lt gy-gy, occ off wh, rr dk gy, p-mod strd f-u f sb ang-sb rd grs, sill fri rd gr sup clus cons wi clr-wh silic cnt, wh dolc cnt intbds ip, arg ip, com wh carb flks, pred non calc, sl calc ip





OBJ: 46Klbs
Rotary: 70RPM
Strokes: 218SPM
Pump Rate: 629GPM

MD: 10,449'
TVD: 7,043.65'
Inclination: 90.64°
Azimuth: 274.87°
VS: 4,387.3'

MD: 10,544'
TVD: 7,042.26'
Inclination: 91.04°
Azimuth: 274.03°
VS: 4,475.51'

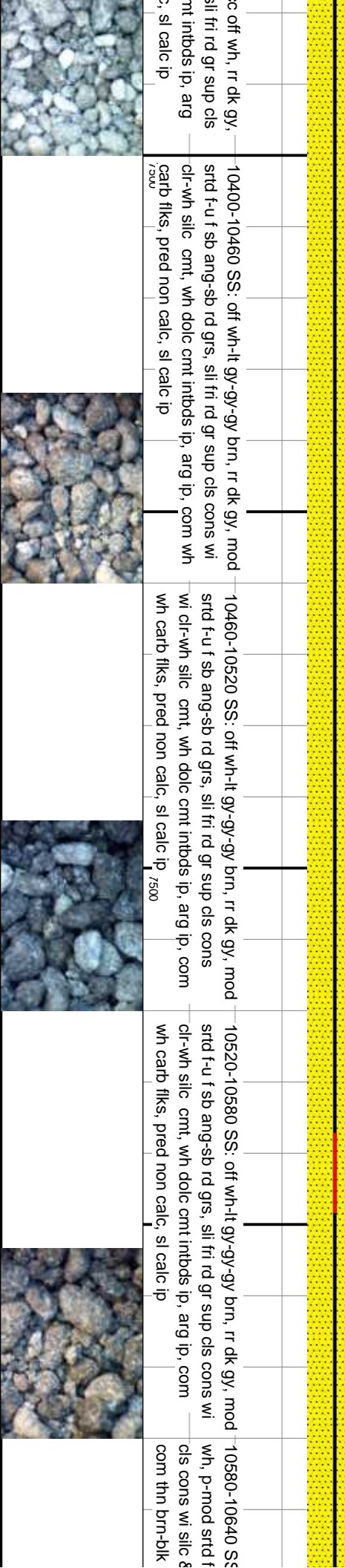
WOB: 36Klbs
Rotary: 70RPM
Strokes: 219SPM
Pump Rate: 629GPM

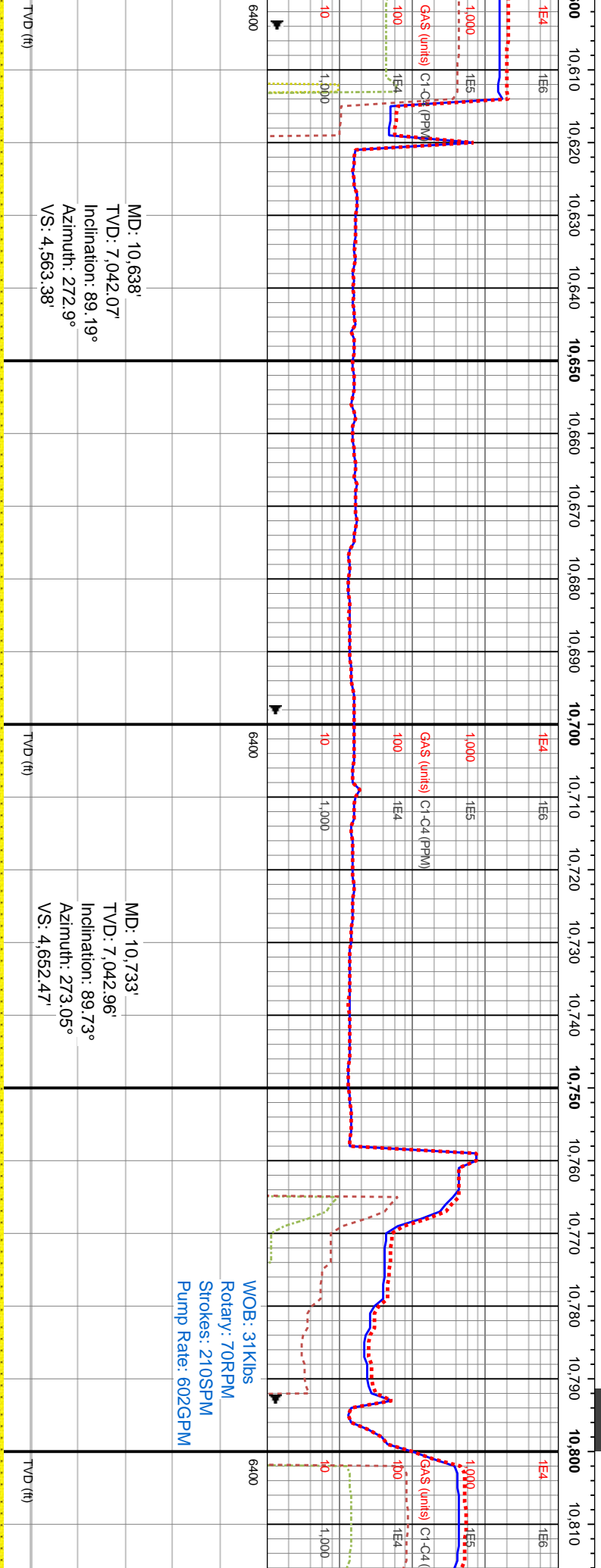
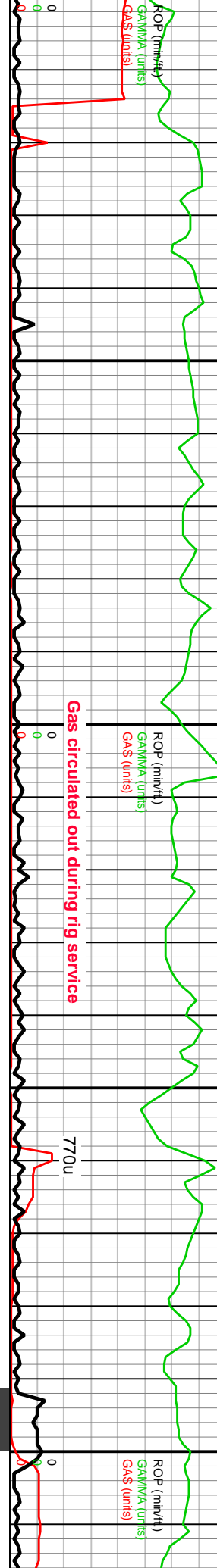
10400-10460 SS: off wh-lt gy-gy-brn, rr dk gy, mod
srtd f-u f sb ang-sb rd grs, sil fri rd gr sup cls cons wi
clr-wh silic cnt, wh dolc cnt inbds ip, arg ip, com wh
carb flks, pred non calc, sl calc ip

10460-10520 SS: off wh-lt gy-gy-brn, rr dk gy, mod
srtd f-u f sb ang-sb rd grs, sil fri rd gr sup cls cons
wi clr-wh silic cnt, wh dolc cnt inbds ip, arg ip, com
wh carb flks, pred non calc, sl calc ip

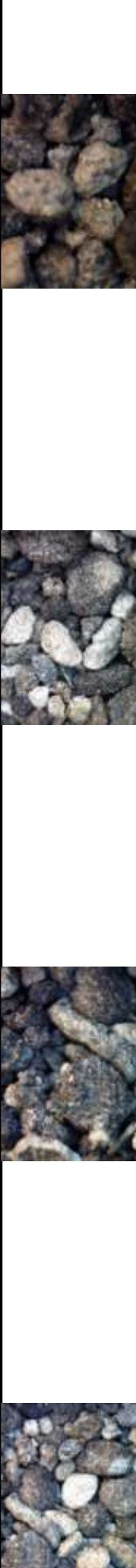
10520-10580 SS: off wh-lt gy-gy-brn, rr dk gy, mod
srtd f-u f sb ang-sb rd grs, sil fri rd gr sup cls cons wi
clr-wh silic cnt, wh dolc cnt inbds ip, arg ip, com
wh carb flks, pred non calc, sl calc ip

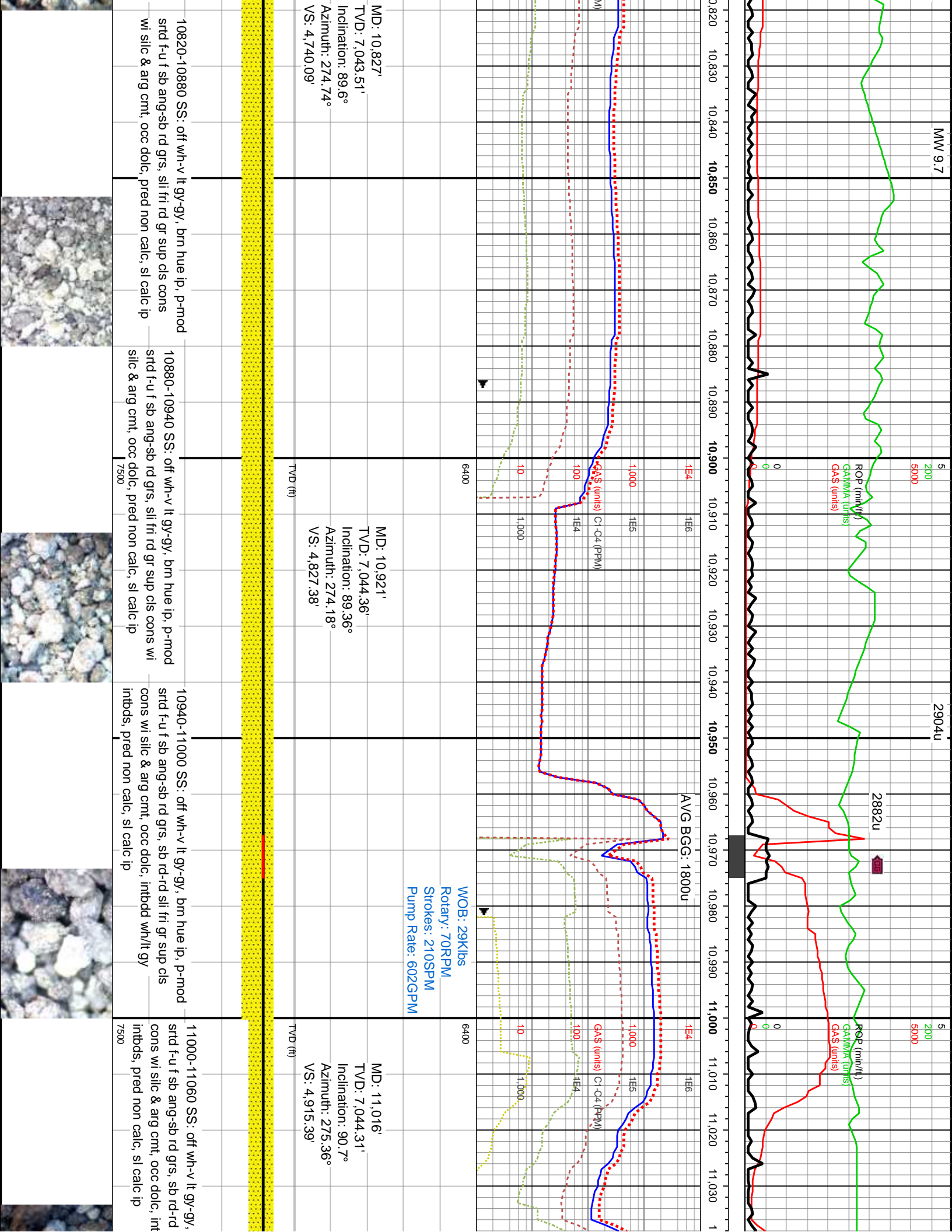
10580-10640 SS: off wh-lt gy-gy-brn, rr dk gy, mod
srtd f-u f sb ang-sb rd grs, sil fri rd gr sup cls cons wi
clr-wh silic cnt, wh dolc cnt inbds ip, arg ip, com
wh carb flks, pred non calc, sl calc ip

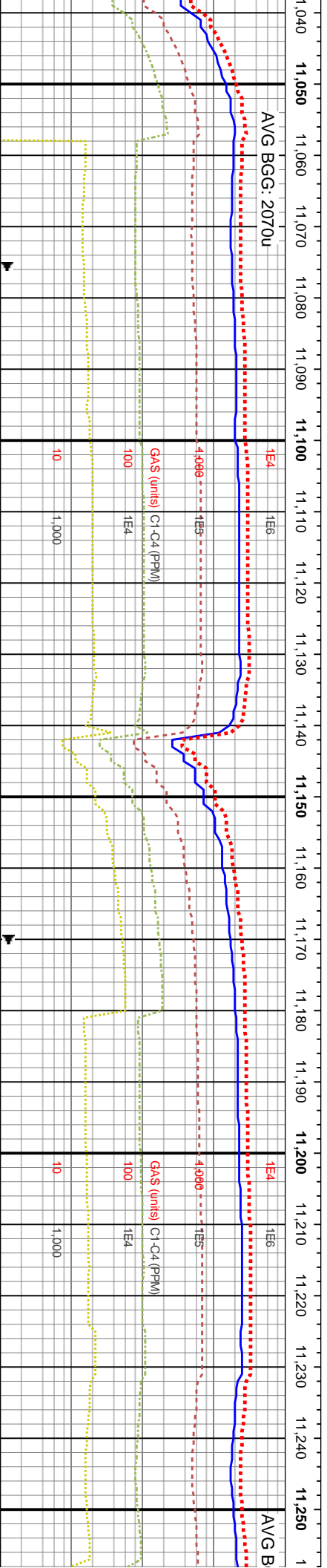
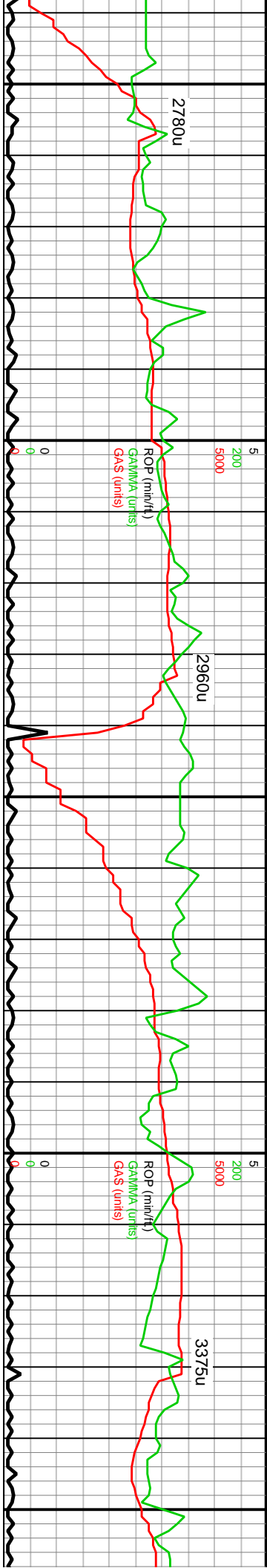




pred lt gy-gy-gy brn-dk gy, occ off	10640-10700 SS: pred lt gy-gy-gy brn-dk gy, occ off	10700-10760 SS: pred gy-gy brn-dk gy, occ off wh-it	10760-10820 SS: pred lt gy-gy-gy brn-dk gy, occ off
u f sb ang-sb rd grs, sil fri rd gr sup	wh, p-mod strd f-u f sb ang-sb rd grs, sil fri rd gr sup	gy dolc clus, p-mod strd f-u f sb ang-sb rd grs, sil fri	wh, p-mod strd f-u f sb ang-sb rd grs, sil fri rd gr sup
cls cons wi silc & arg cnt, occ wh dolc cnt intbds ip,	cls cons wi silc & arg cnt, occ wh dolc cnt intbds ip,	rd gr sup cls cons wi silc & arg cnt, occ dolc, com	cls cons wi silc & arg cnt, occ wh dolc cnt intbds ip,
lamm, pred non calc, sl calc ip	com thn brn-blk lamm, pred non calc, sl calc ip	thn brn-blk lamm, pred non calc, sl calc ip	com thn brn-blk lamm, pred non calc, sl calc ip







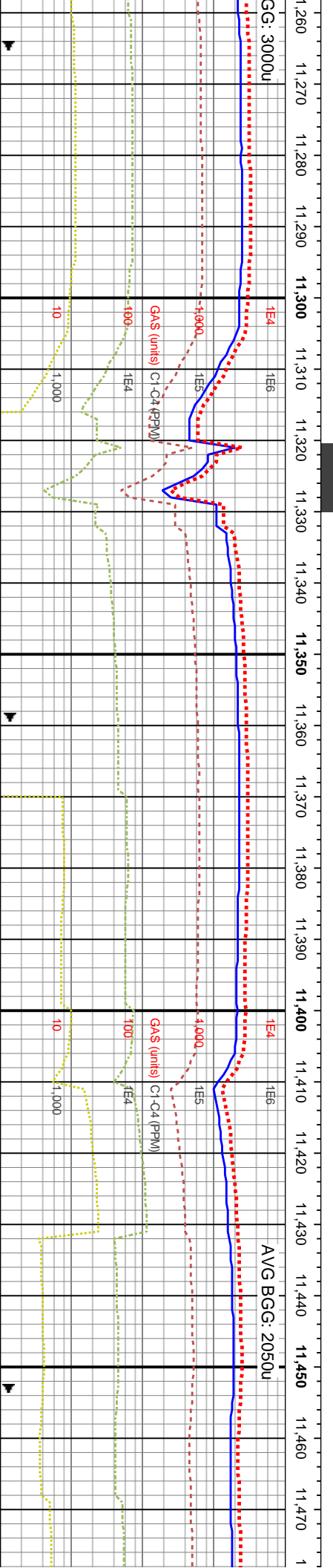
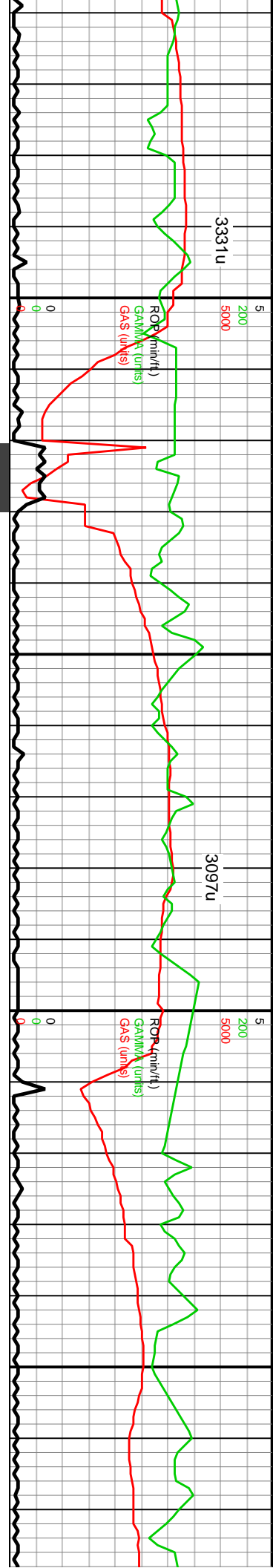
MD: 11,110'
TVD: 7,042.65'
Inclination: 91.31°
Azimuth: 275.45°
VS: 5,002.07'
TVD (ft)

WOB: 40Klbs
Rotary: 71RPM
Strokes: 210SPM
Pump Rate: 602GPM

MD: 11,205'
TVD: 7,041.09'
Inclination: 90.57°
Azimuth: 276°
VS: 5,089.47'
TVD (ft)

11060-11120 SS: pred lt gy-gy, occ dk gy, off off wh, sil fri gr sup cls	11120-11180 SS: off wh-lt gy-gy, occ dk gy, rr brn hue, p-mod srtd sb rd-rd grs, sb rd-rd sil fri gr sup cls cons wi silc & arg cmnt, occ dolc, intbdd wh/lt gy intbds, pred non calc, sl calc ip	11180-11240 SS: pred off wh-v lt gy-gy, rr brn hue ip, rr dk gy silst strg, p-mod srtd f-u f sb ang-sb rd grs, sil fri gr sup cls cons wi pred silc cmnt, arg ip, occ dolc intbds, pred non calc, sl calc ip	11240-11300 SS: hue, p-mod srtd cls cons wi silc & arg cmnt, intbds, pred non
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MD: 11,299'
TVD: 7,040.82'
Inclination: 89.77°
Azimuth: 274.26°
VS: 5,176.34'

WOB: 47Klbs
Rotary: 70RPM
Strokes: 210SPM
Pump Rate: 602GPM

MD: 11,393'
TVD: 7,041.78'
Inclination: 89.06°
Azimuth: 272.84°
VS: 5,264.16'

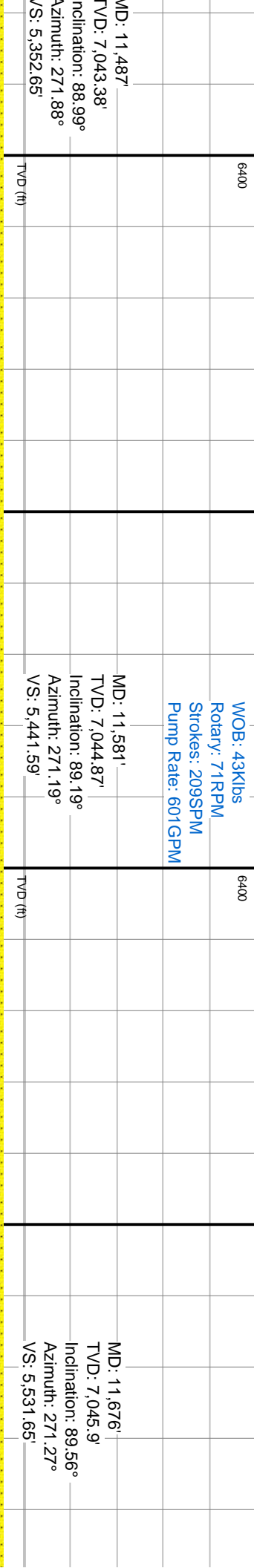
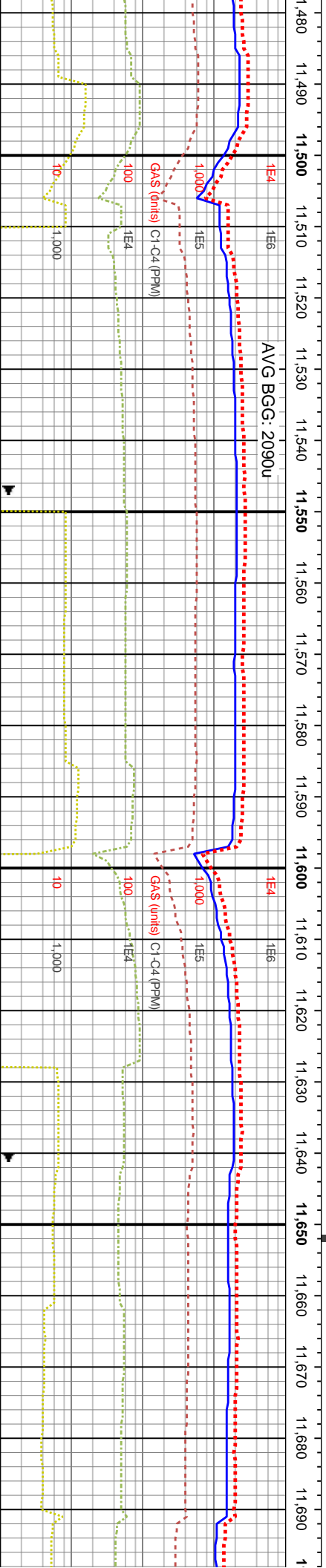
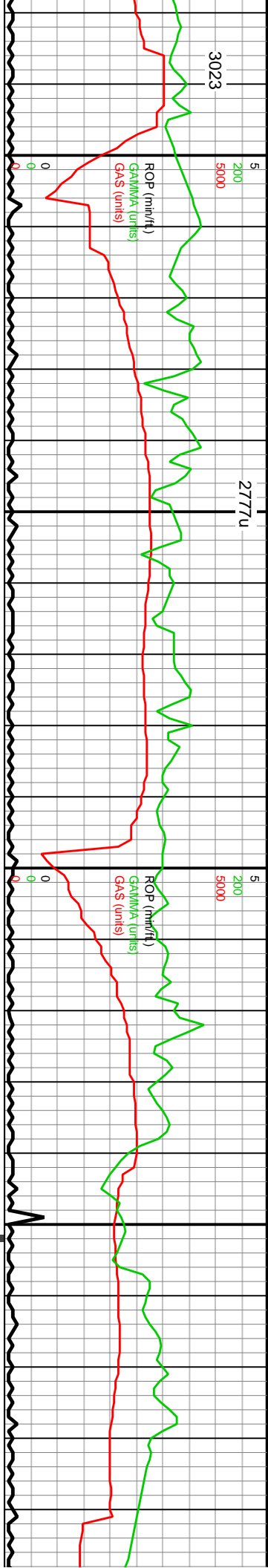
3: off wh-lt gy-gy, occ dk gy, rr brn
sb rd-rd grs, sb rd-rd sll fri gr sup
& arg cnt, occ dolc, intbdd wh/lt gy
calc, sl calc ip

11300-11360 SS: pred off wh-vlt gy-gy, rr brn hue ip,
p-mod strd f-u f sb ang-sb rd grs, sb rd-rd sll fri gr sup
cls cons wi pred silc cnt, arg ip, occ dolc intbds, rr dk
slist strg, pred non calc, sl calc ip

11360-11420 SS: off wh-lt gy-gy, occ dk gy, rr brn hue,
p-mod strd sb rd-rd grs, sb rd-rd sll fri gr sup cls
cons wi silc & arg cnt, occ dolc, intbdd wh/lt gy
intbds, pred non calc, sl calc ip

11420-11480 SS: off wh-lt gy-gy, occ dk gy vf gr-sily
strg, rr brn hue, p-mod strd sb rd-rd grs, sb rd-rd sll fri
gr sup cls cons wi silc cnt, occ dolc & arg strg, pred
non calc, sl calc ip





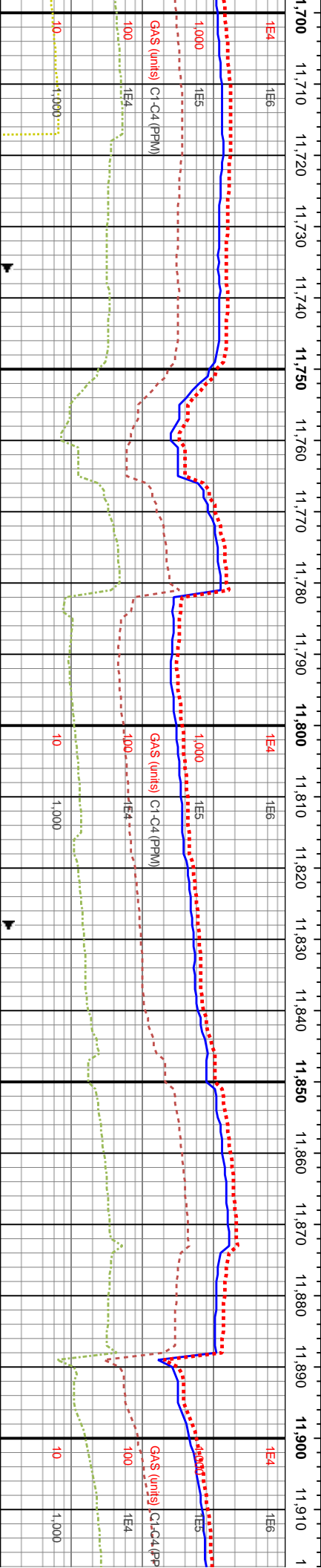
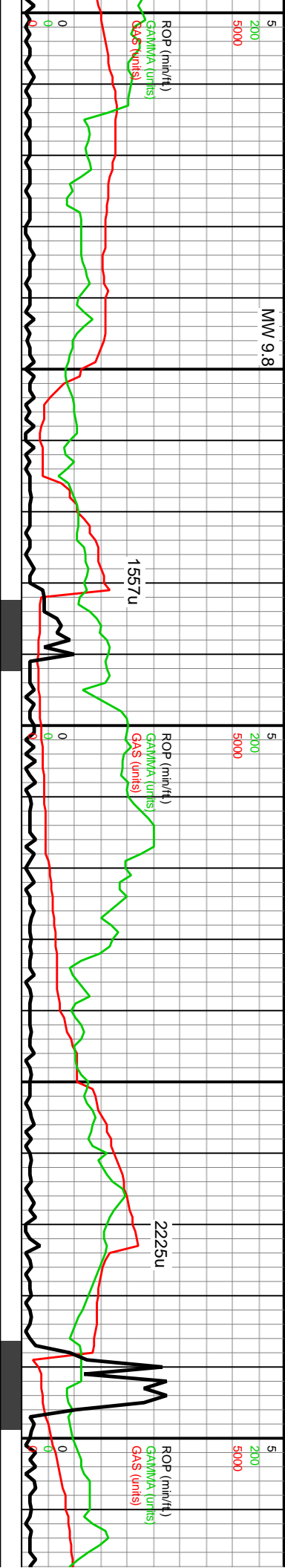
11480-11540 SS: off wh-lt gy-gy, occ dk gy, rr lt brn hue, p-mod strd sb rd-rd grs, dolc/wh carb flks ip, sb rd-rd sli fri gr sup cls cons wi silc & arg cnt, occ dolc, intbdd wh/lt gy intbds, pred non calc, sl calc ip

11540-11600 SS: pred dk gy-off wh-lt gy-gy, rr brn hue ip, p-mod strd sb rd-rd grs, sb rd-rd sli fri gr sup cls cons wi pred silc cnt, occ dolc & arg ip, incr dk gy slist strg, pred non calc, sl calc ip

11600-11660 SS: pred lt gy-gy-dk gy, occ off wh, rr brn hue, p-mod strd sb rd-rd grs, sb rd-rd sli fri gr sup cls cons wi pred silc cnt, occ dolc & arg ip, occ-com v-f-sily dk gy sily strgs, pred non calc, sl calc ip

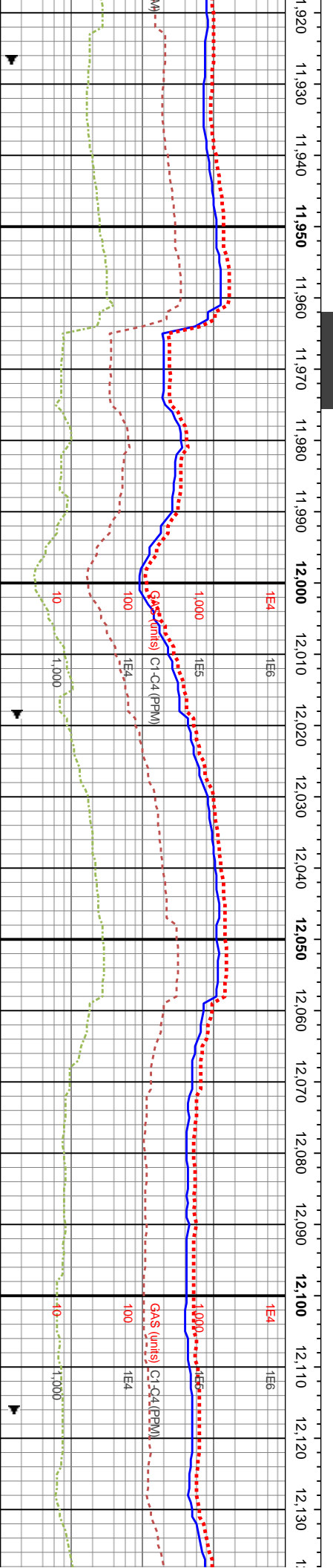
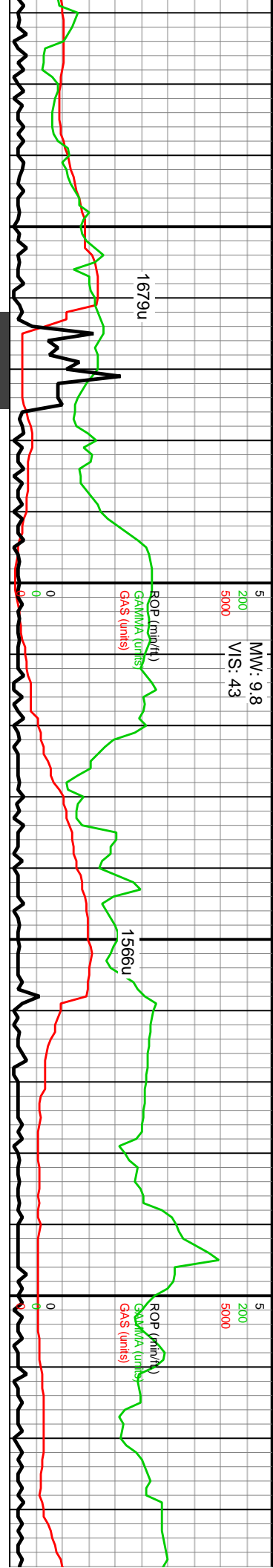
11660-11720 SS (80%): pred lt gy wh, rr brn hue, p-mod strd sb rd-rd gr sup cls cons wi pred silc cnt, occ-com v-f-sily dk gy sily strgs, prn ip, wi 20% LS, off wh-v lt gy, lt tn ip mudst-pkst ip, tr v-f pyr, hi calc





6400	WOB: 39Klbs Rotary: 70RPM Strokes: 212SPM Pump Rate: 613GPM	6400	DP @ 11,830'	6400	
TVD (ft)	MD: 11,770' TVD: 7,046.16' Inclination: 90.13° Azimuth: 272.19° VS: 5,620.46'	TVD (ft)		TVD (ft)	
gy-dk gy, occ off grs, sb rd-rd sil fri occ dolc & arg ip, med non calc, sl calc , cpplxIn-microxln,	11720-11780 LS: offwhit- lt gy brn, tn ip, pred microxln mudst, ip pkst- grnst w rnd carb grs, sme dk silty sh strg, tr vf-f ss, vf pyr	11780-11840 LS: offwhit- lt gy brn, tn ip, pred microxln mudst, spy, ip pkst- grnst w f rnd carb grs, sme dk silty sh strg, tr vf-f ss, vf pyr	11840-11900 LS: offwhit- lt gy brn, sme tn- med gy brn, sb blkly, frm- v hd, pred microxln mudst, spy, ip pkst- grnst w f rnd carb grs, sme silty sh strg, tr vf-f ss, vf pyr	11900-1	med gy l mudst, s sme dk s
7500		7500		7500	





WOB: 37Klbs
Rotary: 70RPM
Strokes: 212SPM
Pump Rate: 613GPM

MD: 11,959'
TVD: 7,042.24'
Inclination: 92.39°
Azimuth: 273.54°
VS: 5,797.33'

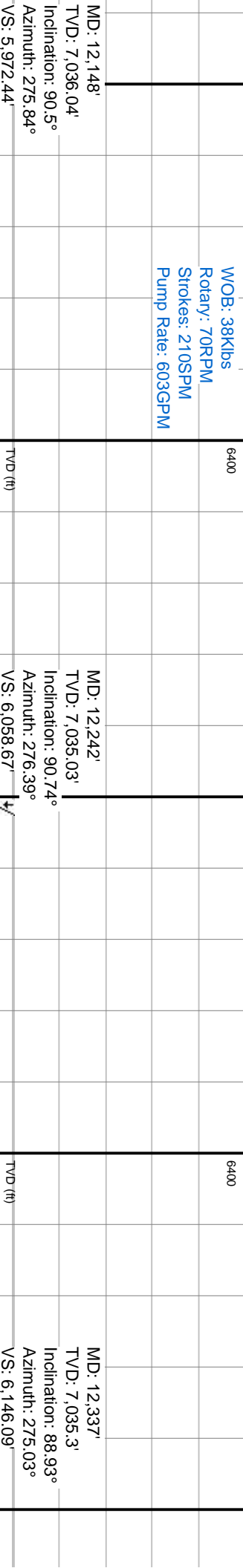
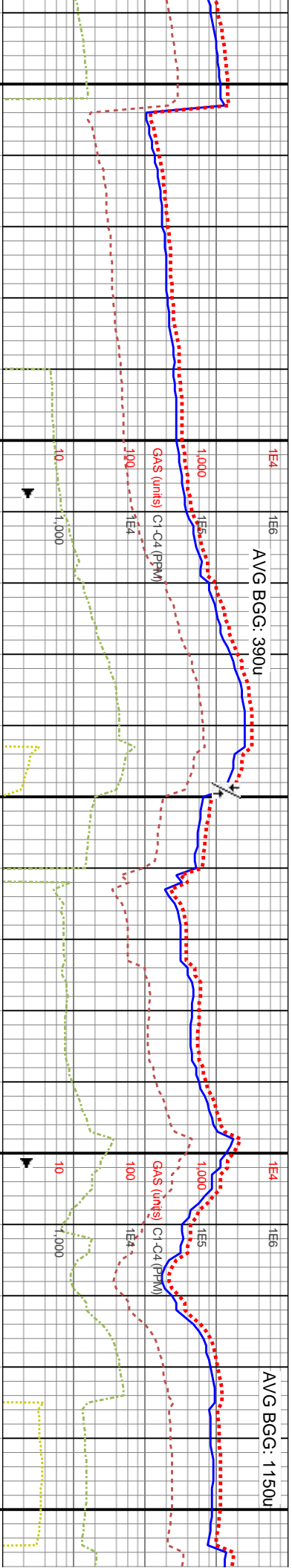
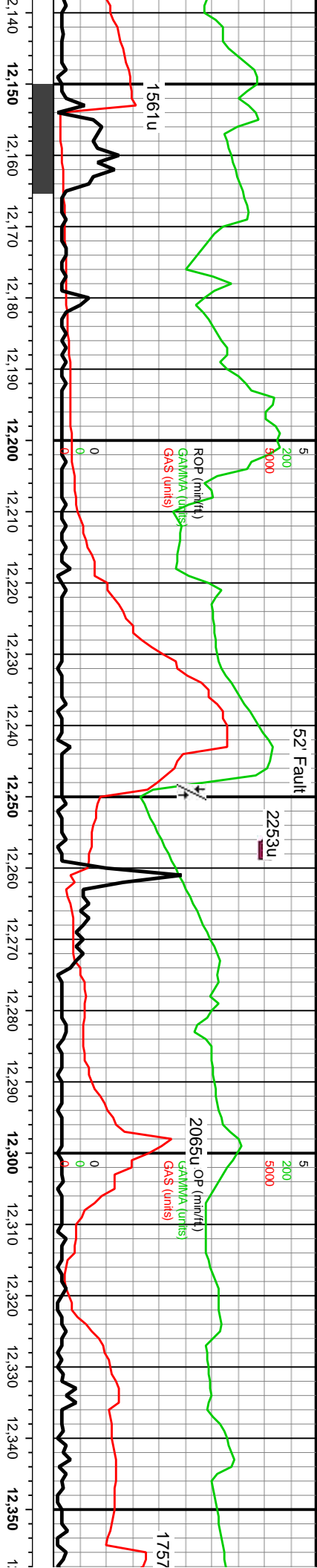
TVD (ft)

MD: 12,053'
TVD: 7,038.38'
Inclination: 92.32°
Azimuth: 274.66°
VS: 5,884.75'

TVD (ft)

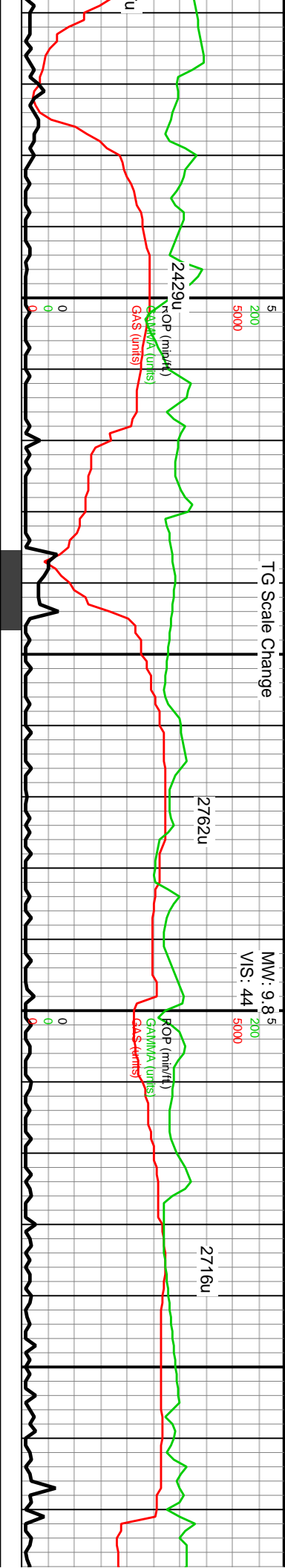
11960-12020 70% LS: offwht- lt gy brn, sme in - gy brn, sb blkyy, frm- v hd, pred microxln mudst, spy, ip pkst- grnst w f md carb grs, sme dk slty sh strg, rr vf- f ss, vf pyr: 30% SLT SH: pred med- dk gy, blkyy, pred hd, ip frm, abnt intbdd ls, v calc	7500
12020-12080 70% LS: offwht- lt gy brn, sme in - med gy brn, sb blkyy, frm- v hd, pred microxln mudst, spy, ip pkst- grnst w f md carb grs, sme dk slty sh strg, rr vf- f ss, vf pyr: 30% SLT SH: pred med- dk gy, blkyy, pred hd, ip frm, abnt intbdd ls, v calc	7500
12080-12140 60% SLTY SH: pred med- dk gy, pred blkyy, pred hd, ip frm, abnt intbdd ls v calc thru: 40% LS: offwht- lt gy brn, sme t - med gy brn, sb blkyy, sl frm, pkst w f md carb grs, occ spy, occ mudst, sme dk slty sh strg	7500



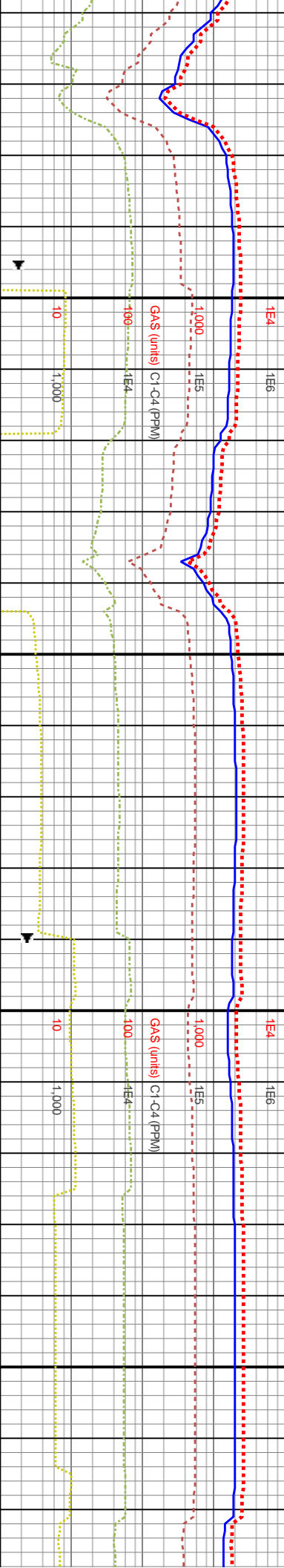


12140-12200 60% SLTY SH: pred med-dk gy, pred blk, pred hd, ip frm, abnt inbddd ls, v calc thru; 40% LS: offwht-lt gy brn, sme tn - med gy brn, sb blk, sl frm, pkst w f rnd carb grs, occ spy, occ mudst, sme dk silty sh strg	12200-12260 80% SLTY SH: pred med-dk gy, sme blk, pred blk, pred hd, ip frm, abnt inbddd ls, v calc thru; 20% LS: offwht-lt gy brn, sme tn - med gy brn, sb blk, sl frm, pkst w f rnd carb grs, occ spy, occ mudst, sme dk silty sh strg	12260-12320 80% SLTY SH: pred med gy blk, pred blk, sft- hd, occ inbddd ls, v calc thru; 20% SS: pred gy- gy brn trns, pred v f- occ f grd sd, sb and- ang, ip sb rd, unconcs, scat thru, sme lse sil- arg cmt	12320-12380 SS: pred sb blk, pred v f- occ ang, tr unconcs grs, a sme lse sil- arg cmt
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12,2360 12,370 12,380 12,390 12,400 12,410 12,420 12,4VVG BGG: 1230u450 12,460 12,470 12,480 12,490 12,500 12,510 12,520 12,530 12,540 12,550 12,560 12,570 1



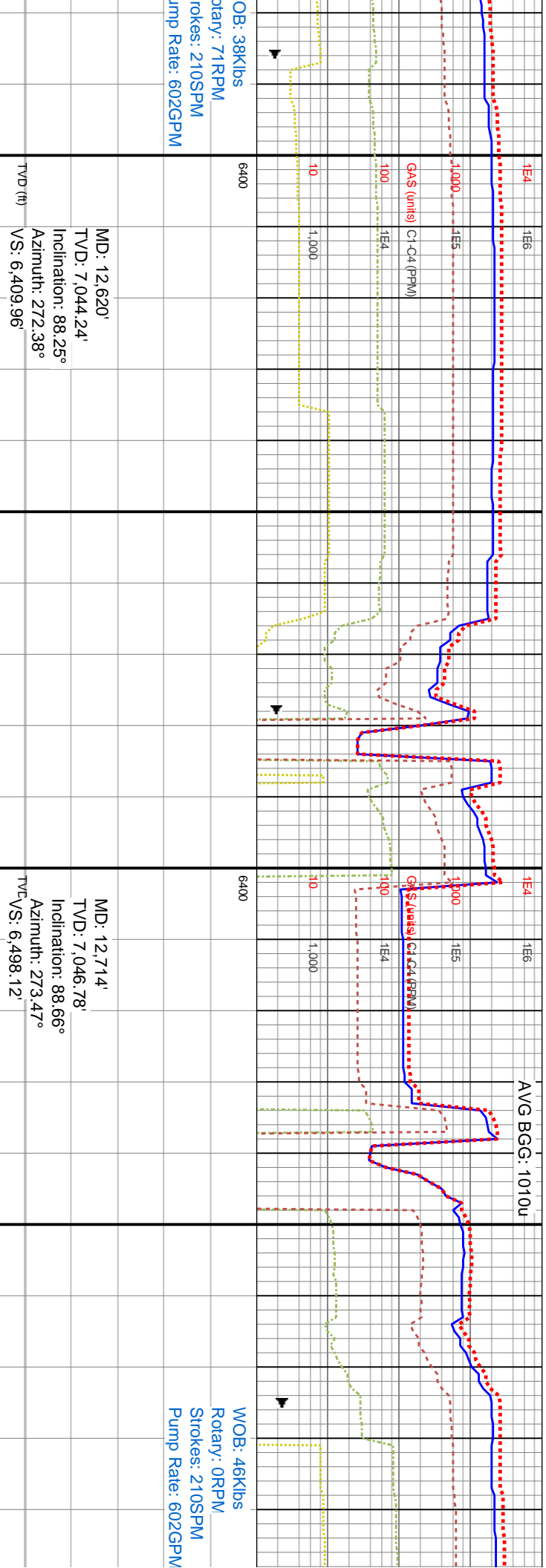
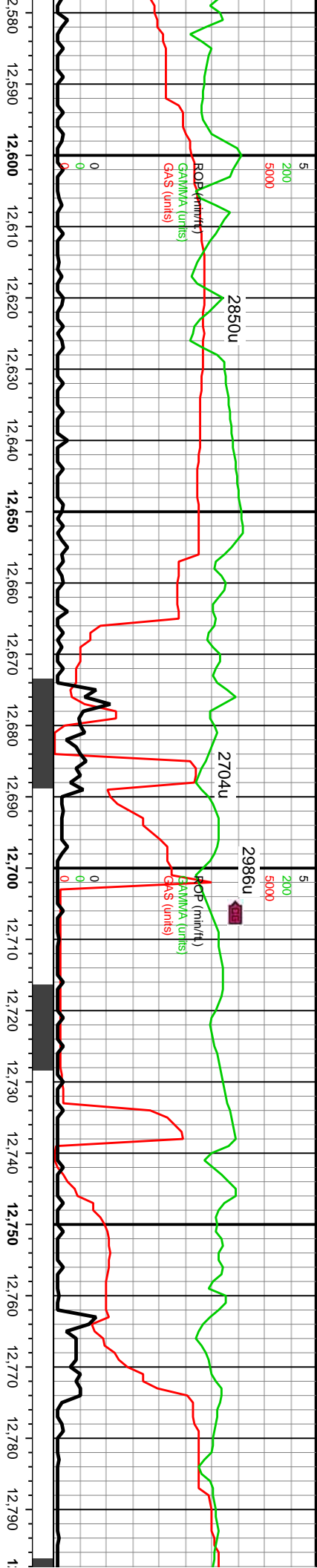
WOB: 44Klbs
Rotary: 71RPM
Strokes: 210SPM
Pump Rate: 602GPM

MD: 12,431'
TVD: 7,037.69'
Inclination: 88.16°
Azimuth: 274.26°
VS: 6,233.23'

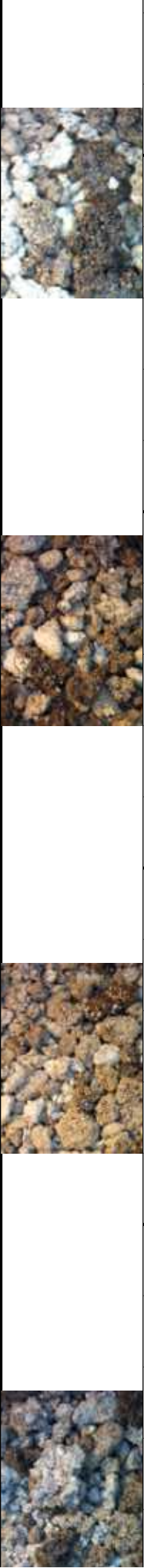
MD: 12,525'
TVD: 7,040.98'
Inclination: 87.82°
Azimuth: 273.34°
VS: 6,320.85'

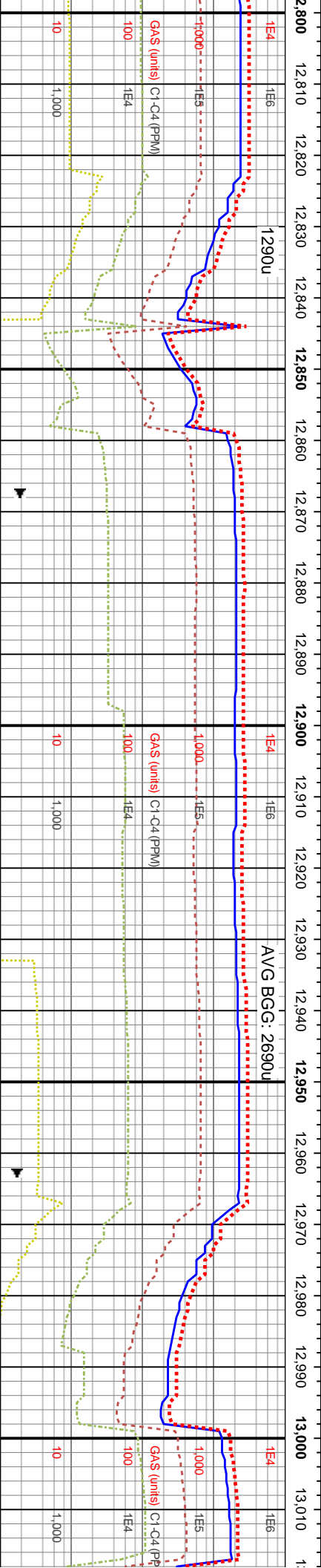
12380-12440 SS: pred gy- gy brn tmsl, sb blkly, pred v f- occ f grd sd cls, sb rnd- arg, tr uncons grs, arg- sil cnt, sl calc, sme lse sil- arg cnt, tr pyr	12440-12500 SS: pred gy- gy brn tmsl, sb blkly, pred v f- occ f grd sd cls, sb rnd- ang, tr uncons grs, arg- sil cnt, sl calc, sme lse sil- arg cnt, tr pyr	12500-12560 SS: pred gy- gy brn tmsl, sme bf- offwht, pred sb blkly, sl frm- fr, ip hd, pred v f- occ f grd cons sd, pred sb rnd- ang, tr uncons grs, abnt arg- sil cnt, sl calc, sme lse sil- arg cnt, tr pyr
7300	7500	





OB: 38Klbs Rotary: 71RPM Strokes: 210SPM Pump Rate: 602GPM	MD: 12,620' TVD: 7,044.24' Inclination: 88.25° Azimuth: 272.38° TVS: 6,409.96'	1260-12620 SS: pred gy- gy brn tmsl, sme bl- offwht, pred sb blkly, sl frm- fr, ip offwht, pred v f- occ f grd cons sd, pred sb ang, tr uncons grs, abt arg- sil cnt, sme lse sil- arg cnt, tr pyr	12620-12680 SS: pred gy- gy brn tmsl, sme bl- offwht, pred sb blkly, sl frm- fr, ip hd, pred v f- occ f grd cons sd, pred sb rmd- ang, tr uncons grs, abt arg- sil cnt, sl calc, sme lse sil- arg cnt, tr pyr	12680-12740 SS: pred gy- gy brn tmsl, sme bl- offwht, pred sb blkly, sl frm- fr, ip hd, pred v f- occ f grd cons sd, pred sb rmd- ang, tr uncons grs, abt arg- sil cnt, sl calc, sme lse sil- arg cnt, tr pyr	12740-12800 SS: pred gy- gy brn tmsl, sme bl- offwht, pred sb blkly, sl frm- fr, ip hd, pred v f- occ f grd cons sd, pred sb rmd- ang, tr uncons grs, abt arg- sil cnt, sl calc, sme lse sil- arg cnt, tr pyr
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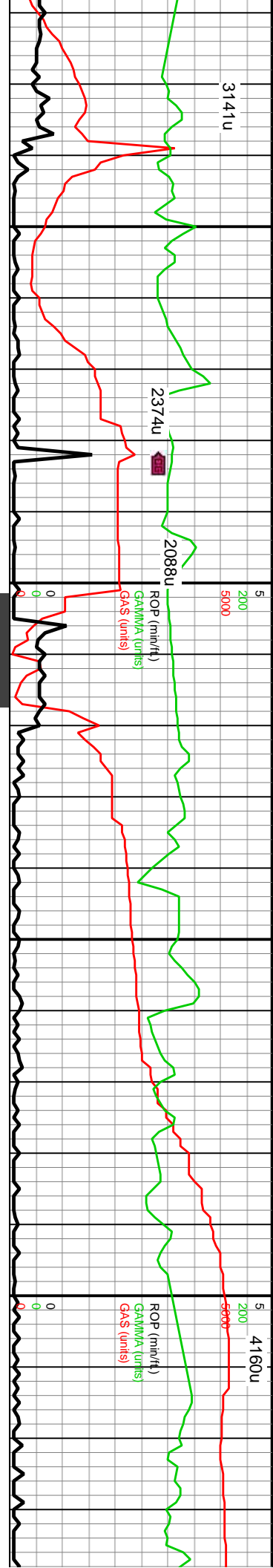




6400	6400	6400	6400	6400
MD: 12,809'	MD: 12,903'	MD: 12,998'	MD: 12,903'	MD: 12,809'
TVD: 7,048.22'	TVD: 7,049.52'	TVD: 7,051.13'	TVD: 7,049.52'	TVD: 7,048.22'
Inclination: 89.6°	Inclination: 88.82°	Inclination: 89.23°	Inclination: 88.82°	Inclination: 89.6°
Azimuth: 274.7°	Azimuth: 272.27°	Azimuth: 272.22°	Azimuth: 272.27°	Azimuth: 274.7°
VS: 6,586.54'	VS: 6,674.39'	VS: 6,763.89'	VS: 6,674.39'	VS: 6,586.54'

12800-12860 SS: pred gy- gy brn tmsl, sme bf-offwht, pred sb blkly, sl frm- fr, ip hd, pred v f- occ f grd cons sd, pred sb rnd- ang, tr uncons grs, abnt arg- sil cmt, sl calc, sme lse sil- arg cmt, tr pyr	12860-12920 SS: pred gy- gy brn tmsl, sme bf-offwht, pred sb blkly, sl frm- fr, ip hd, pred v f- occ f grd cons sd, pred sb rnd- ang, tr uncons grs, abnt arg- sil cmt, sl calc, sme lse sil- arg cmt, tr pyr	12920-12980 SS: pred gy- gy brn tmsl, sme bf-offwht, pred sb blkly- lse grs, sl frm- sft, ip hd slt inbds, pred v f- occ f grd cons sd, pred sb rnd- ang, pred uncons grs, abnt arg- sil cmt, sl calc, sme lse sil- arg cmt, tr pyr	12980-13040 SS: pred g bf- offwht, pred sb blkly- l ip hd slt inbds, pred v f- pred sb rnd- ang, pred u sme lse sil- arg cmt, tr pyr
7500	7500	7500	7500



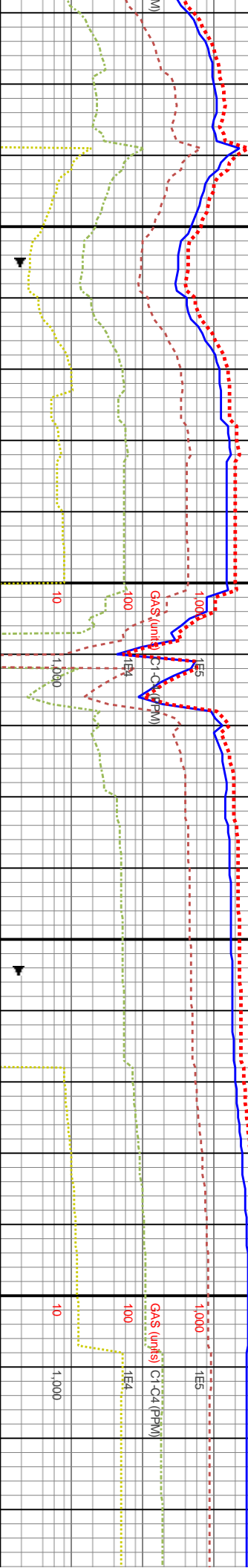


13,020 13,030 13,040 13,050 13,060 13,070 13,080 13,090 13,100 13,110 13,120 13,130 13,140 13,150 13,160 13,170 13,180 13,190 13,200 13,210 13,220 13,230

AVG BGC: 1890u

AVG BGC: 1690u

AVG BGC: 3840u



MD: 13,094'

TVD: 7,051.32'

Inclination: 90.54°

Azimuth: 273.46°

VS: 6,854'

VS: 6,942.49'

TVD (ft)

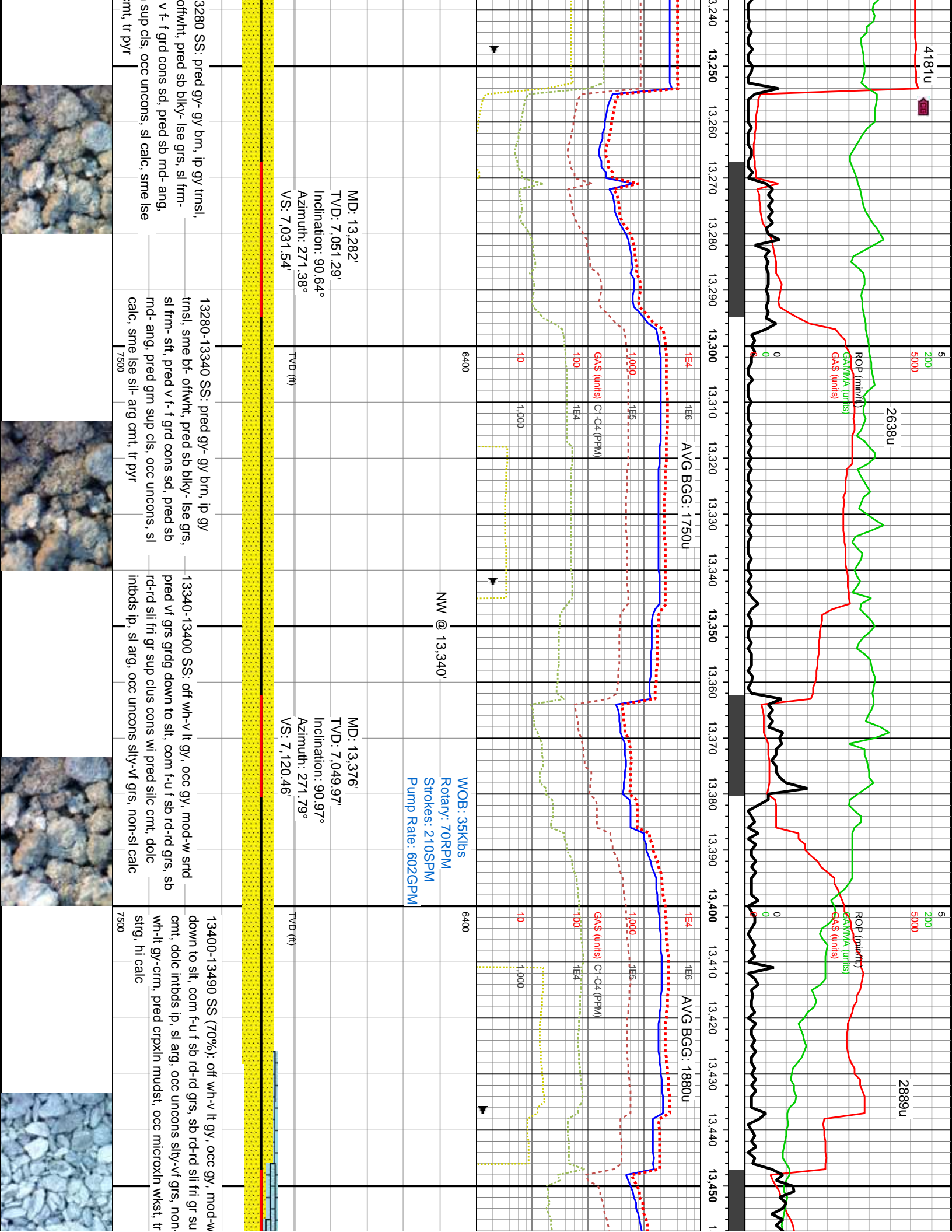
13040-13100 SS: pred gy- gy brn trns, sme
bf- offwht, pred sb blk- lse grs, sl frm- sft, ip
hd silt intbds, pred v f- occ f grd cons sd,
pred sb rnd- ang, pred uncon grs, sl calc,
sme lse sil- arg cmt, tr pyr

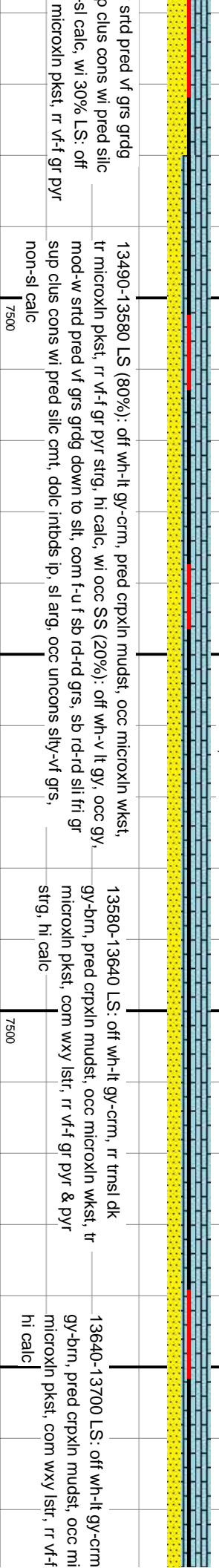
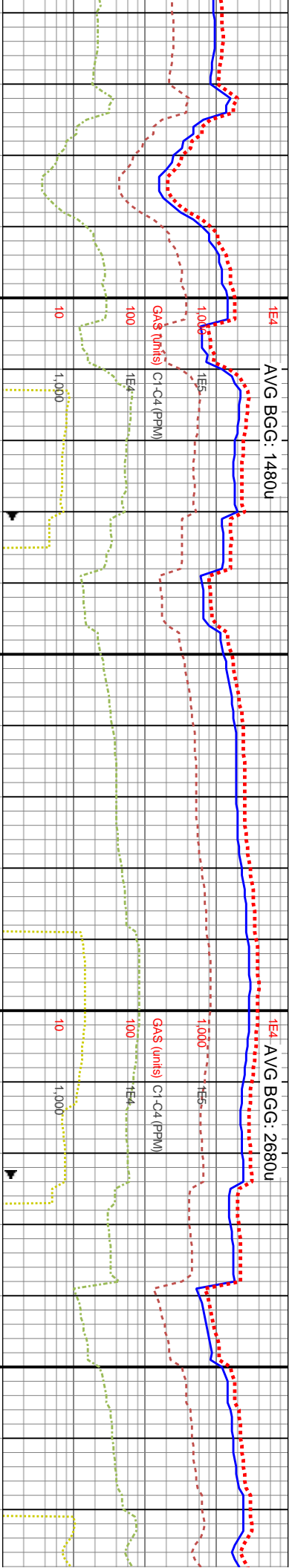
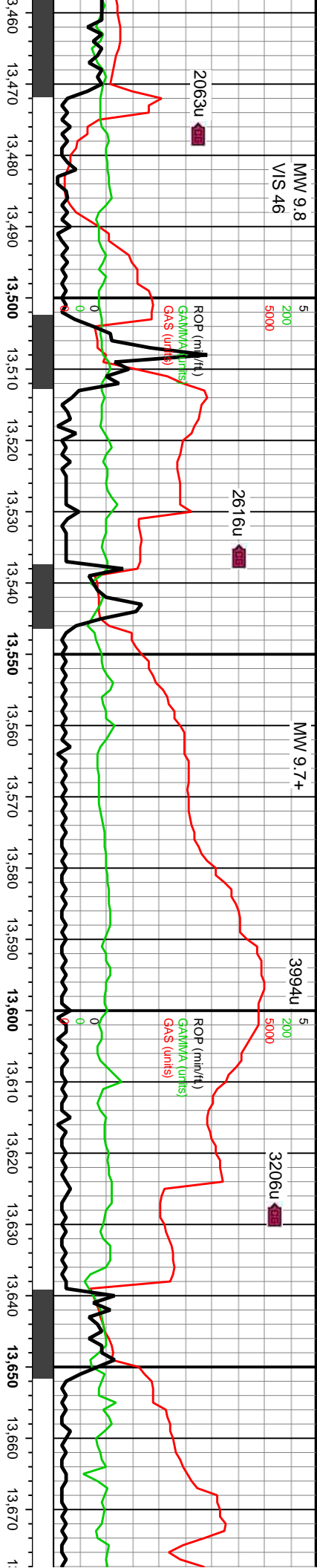
13100-13160 SS: pred gy- gy brn, ip gy trns, sme
bf- offwht, pred sb blk- lse grs, sl frm- sft, pred v f- f
grd cons sd, pred sb rnd- ang, pred grn sup cls, occ
uncons, sl calc, sme lse sil- arg cmt, tr pyr

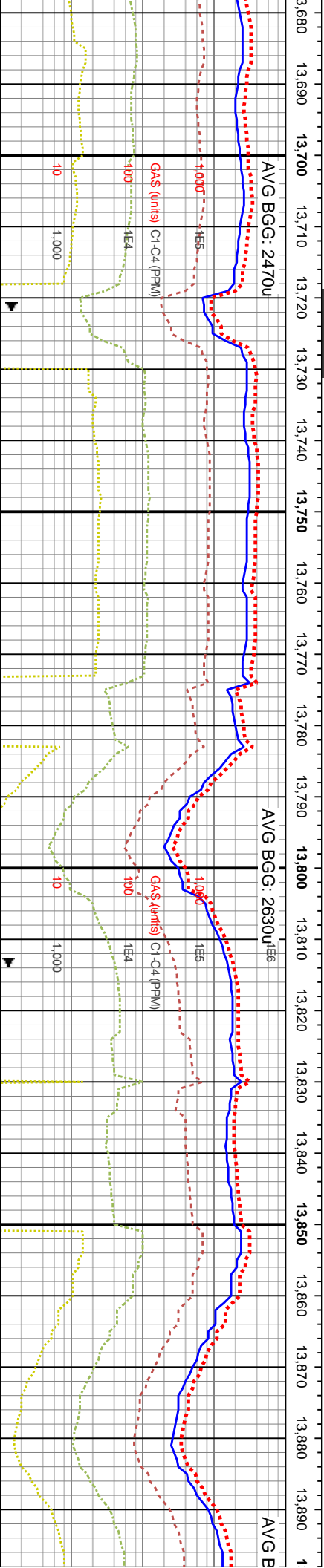
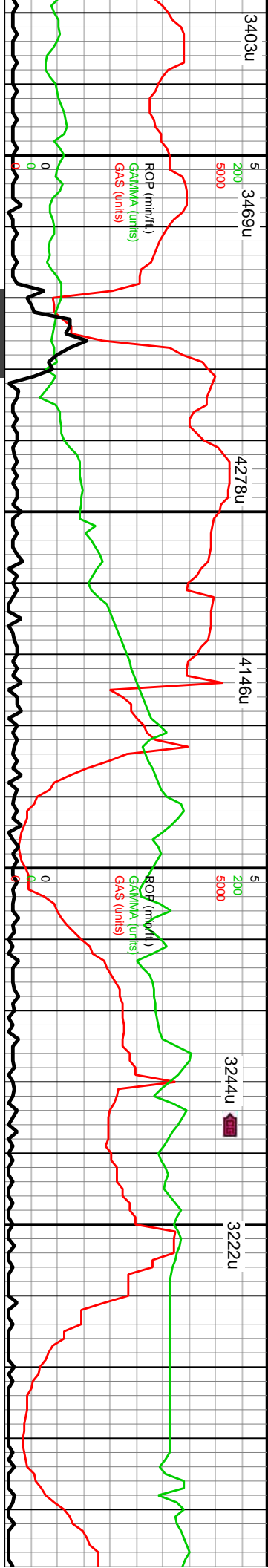
13160-13220 SS: pred gy- gy brn, ip gy trns, sme
bf- offwht, pred sb blk- lse grs, sl frm- sft, pred v f- f
grd cons sd, pred sb rnd- ang, pred grn sup cls, occ
uncons, sl calc, sme lse sil- arg cmt, tr pyr

13220-13280 SS: pred gy- gy brn, ip gy trns, sme
bf- offwht, pred sb blk- lse grs, sl frm- sft, pred v f- f
grd cons sd, pred sb rnd- ang, pred grn sup cls, occ
uncons, sl calc, sme lse sil- arg cmt, tr pyr





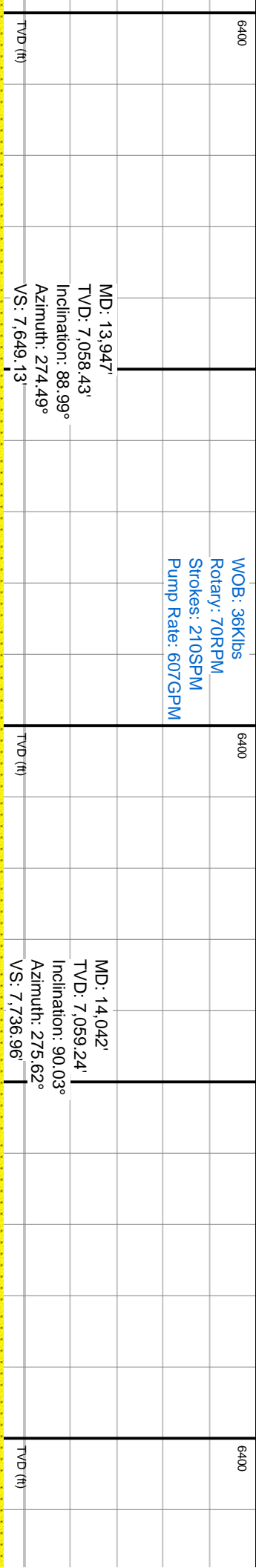
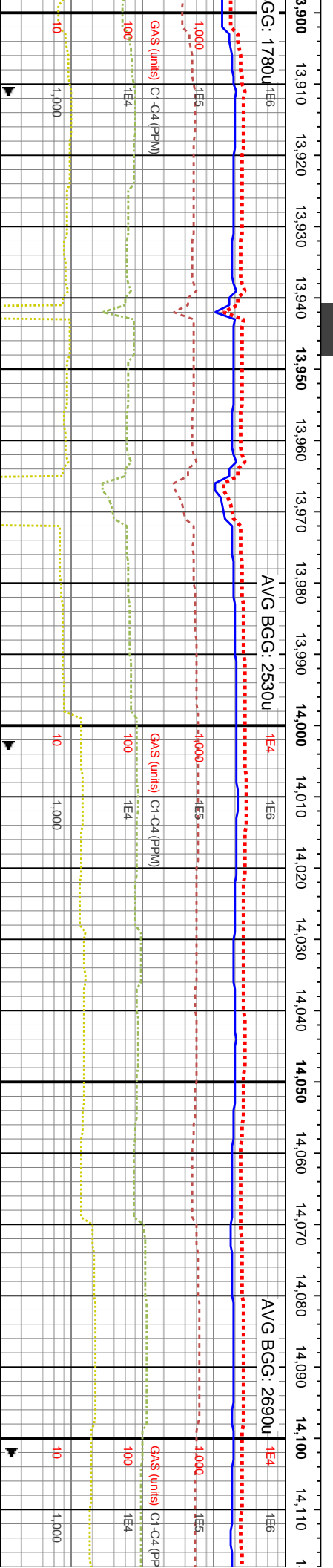
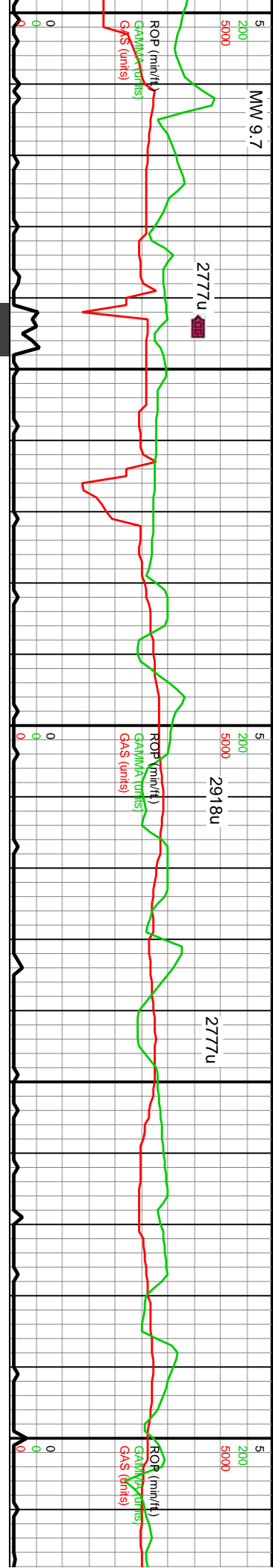




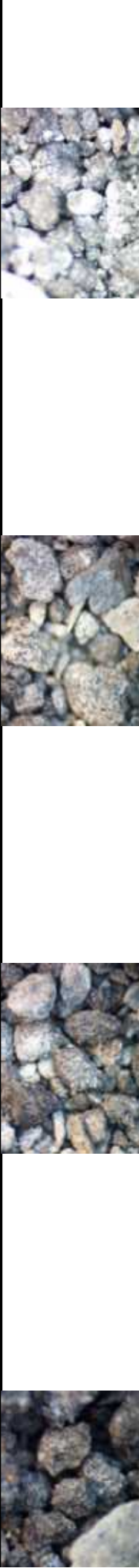
6400	MD: 13,756' TVD: 7,051.74' Inclination: 88.09° Azimuth: 275.41° VS: 7,472.32'	6400	MD: 13,851' TVD: 7,055.45' Inclination: 87.45° Azimuth: 274.66° VS: 7,560.1'
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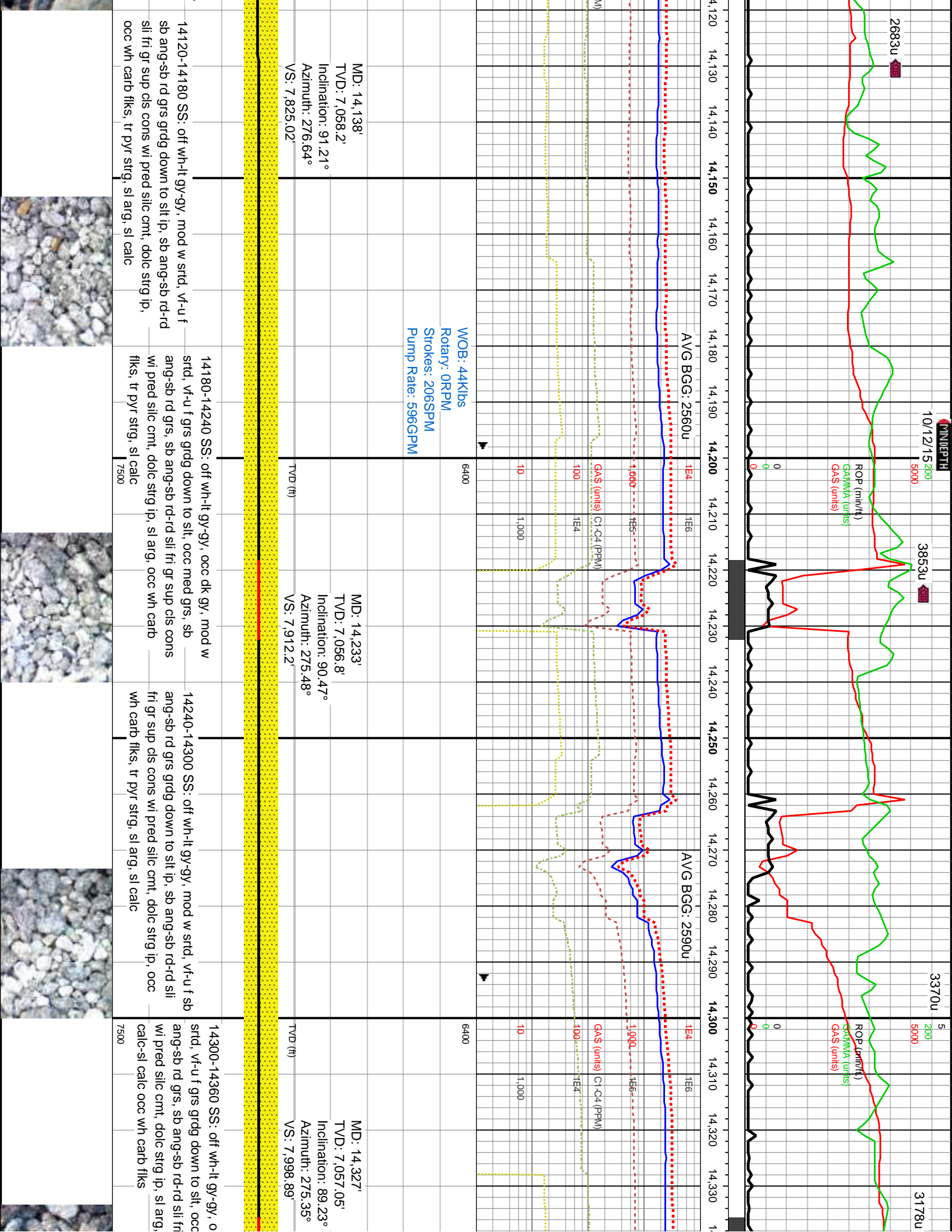
13700-13760 LS (90%): crm-off wh-lt gy, pred crpxln mudst, occ microxln wkst, tr microxln pkst, rr vf-f gr pyr strng, hi calc, wi occ SS (10%): off wh-v lt gy, occ gy, mod-w srted pred vf grs grdg down to silt, com f-u f sb rd-rd grs, sb rd-rd sli fri gr sup clus cons wi pred silic cmt, dolc intbds ip, sl arg, occ uncons silty-vf grs, non-sl calc 7300	13760-13820 SS: pred gy, com lt gy, occ dk gy, mod w srted, vf-u f grs grdg down to silt, occ med grs, sb ang-sb rd-rd grs, sb ang-sb rd-rd sli fri gr sup clus cons wi pred silic cmt, dolc strng ip, tr pyr strng, sl arg, sl calc 7500	13820-13880 SS: pred gy, com lt gy, occ dk gy, mod w srted, pred vf-u f occ med sb ang-sb rd-rd grs grdg down to silt ip, sb rd-rd sli fri gr sup clus cons wi pred silic cmt, dolc strng ip, tr pyr strng, sl arg, sl calc	13880-13940 SS: w srted, vf-u f grs ang-sb rd grs, st wi pred silic cmt,
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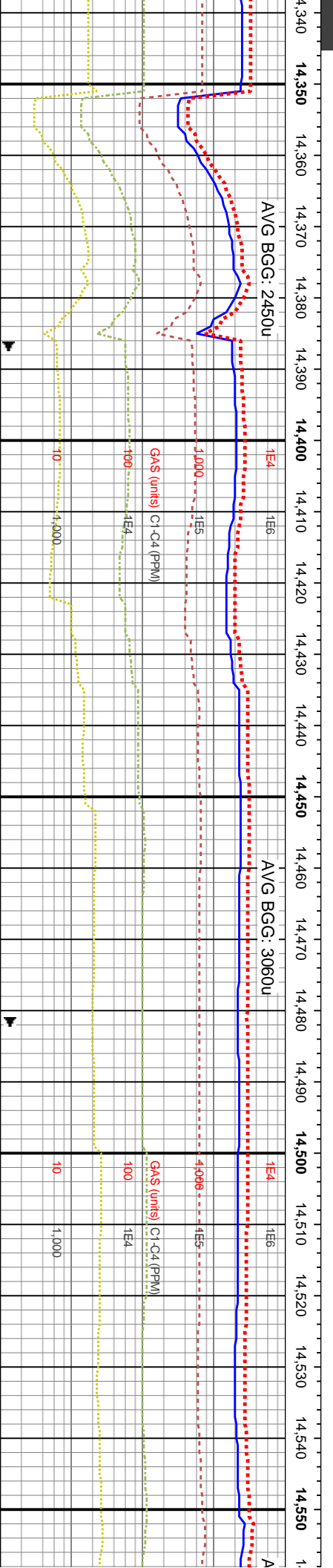
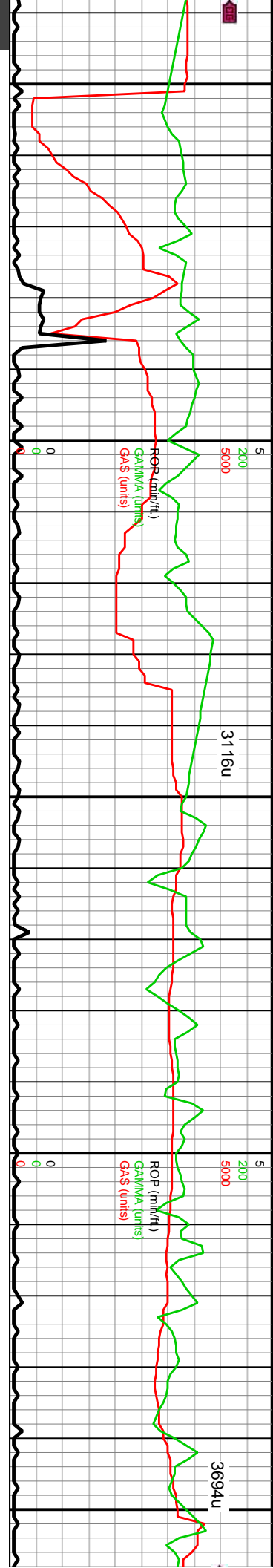




13940-14000 SS:lt gy-gy, rr dk gy med gr incl & rr thin lamm, mod w strd, vf-u f sb ang-sb rd grs grdg down to silt, sb ang-sb rd-rd silt fri gr sup cls cons wi pred silic cnt, dolc strg ip, tr pyr strg, sl arg, sl calc		14000-14060 SS:lt gy-gy, rr dk gy med gr incl & rr thin lamm, mod w strd, vf-u f sb ang-sb rd grs grdg down to silt, sb ang-sb rd-rd silt fri gr sup cls cons wi pred silic cnt, dolc strg ip, tr pyr strg, sl arg, sl calc		14060-14120 SS: pred gy, com lt gy, occ dk gy, mod w strd, vf-u f grs grdg down to silt, occ med grs, sb ang-sb rd grs, sb ang-sb rd-rd silt fri gr sup cls cons wi pred silic cnt, dolc strg ip, tr pyr strg, sl arg, sl calc	
13940-14000 SS:lt gy-gy, rr dk gy med gr incl & rr thin lamm, mod w strd, vf-u f sb ang-sb rd grs grdg down to silt, sb ang-sb rd-rd silt fri gr sup cls cons wi pred silic cnt, dolc strg ip, tr pyr strg, sl arg, sl calc		14000-14060 SS:lt gy-gy, rr dk gy med gr incl & rr thin lamm, mod w strd, vf-u f sb ang-sb rd grs grdg down to silt, sb ang-sb rd-rd silt fri gr sup cls cons wi pred silic cnt, dolc strg ip, tr pyr strg, sl arg, sl calc		14060-14120 SS: pred gy, com lt gy, occ dk gy, mod w strd, vf-u f grs grdg down to silt, occ med grs, sb ang-sb rd grs, sb ang-sb rd-rd silt fri gr sup cls cons wi pred silic cnt, dolc strg ip, tr pyr strg, sl arg, sl calc	







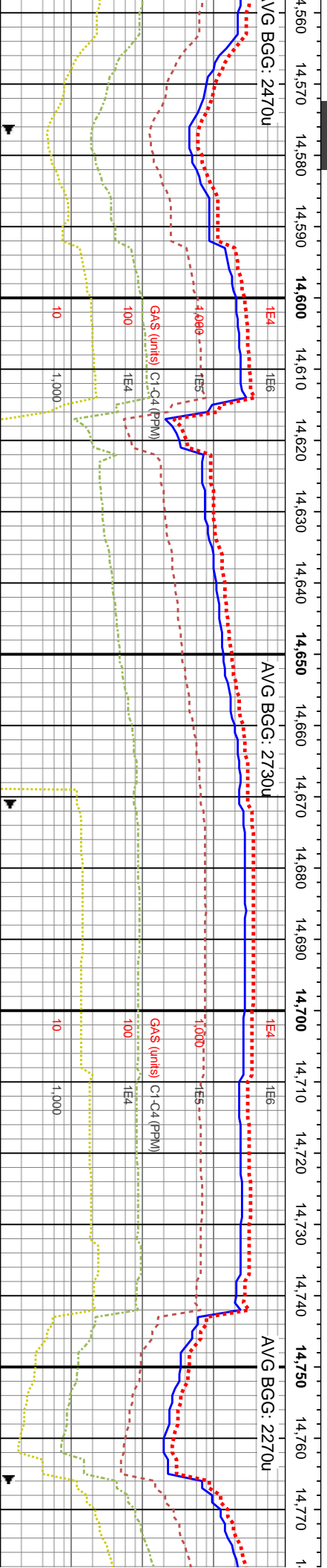
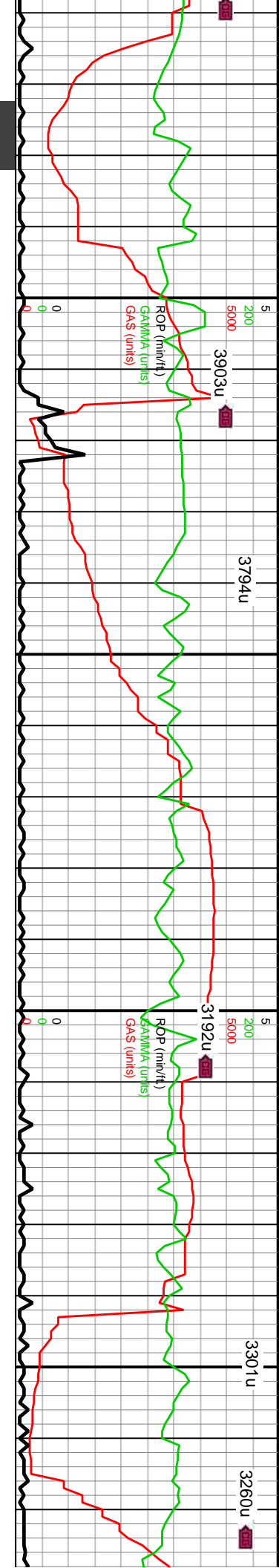
WOB: 37Klbs
Rotary: 71RPM
Strokes: 209SPM
Pump Rate: 602GPM

MD: 14,422'
TVD: 7,058.11'
Inclination: 89.5°
Azimuth: 274.84°
VS: 8,086.7'

MD: 14,516'
TVD: 7,058.3'
Inclination: 90.27°
Azimuth: 274.75°
TVD (th) VS: 8,173.77'

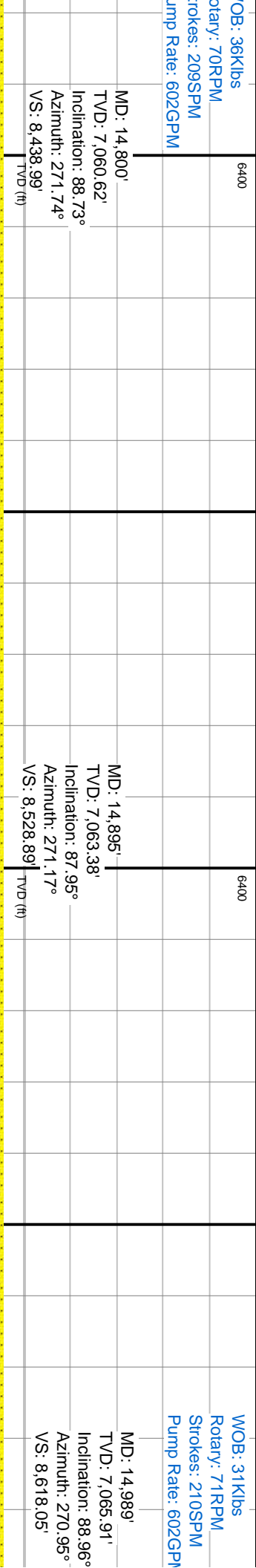
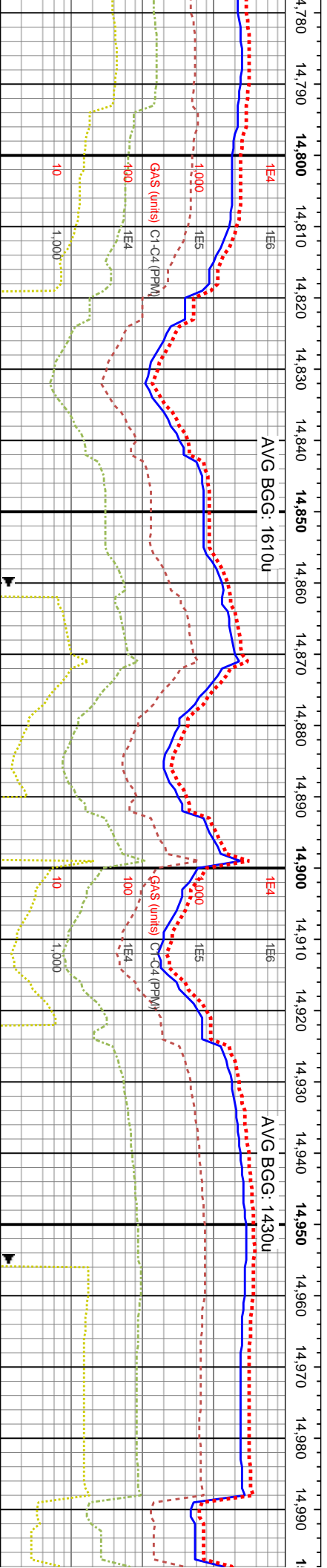
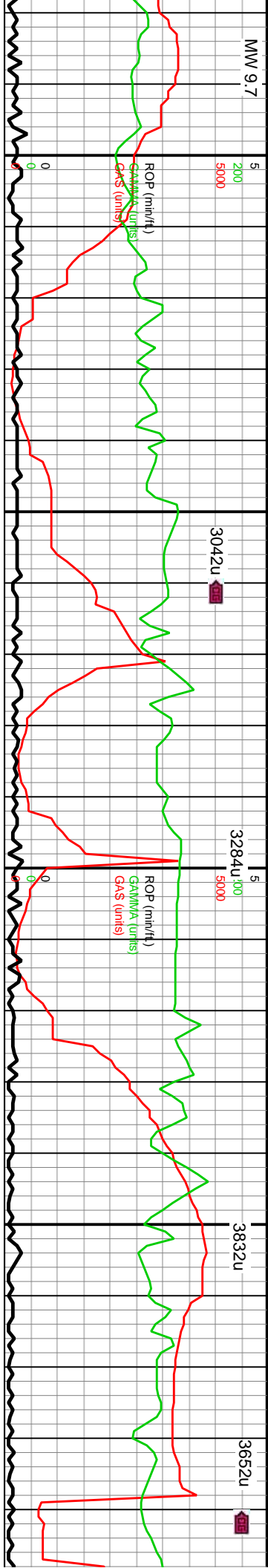
cc dk gy, mod w med grs, sb gr sup cls cons tr pyr strg, non	14360-14420 SS: off wh-it gy-gy, occ dk gy, mod w srt'd, vf-u f grs grdg down to silt, occ med grs, sb ang-sb rd grs, sb ang-sb rd-rd sli fri gr sup cls cons wi pred silic cnt, dolc strg ip, sl arg, occ wh carb flks, tr pyr strg, sl calc	7500	14420-14480 SS: pred gy-gy wi sl brn hue, occ lt gy-off wh, mod-mod w srt'd, vf-u f sb ang-sb rd grs, sli fri gr sup cls cons wi pred silic cnt, tr dolc strg, sl arg ip, tr vf pyr, non calc-sl calc	7500	14480-14540 SS: pred gy-gy wi sl brn hue, occ lt gy, rr off wh, mod w srt'd, vf-u f grs grdg down to silt ip, sb ang-sb rd grs, sb ang-sb rd-rd sli fri gr sup cls cons wi pred silic cnt, dolc strg ip, sl arg, tr pyr strg, non-sl calc	7500	14540-14600 S: rr off wh, mod w ang-sb rd grs, s cons wi pred silic	calc
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WOB: 35Klbs Rotary: 70RPM Strokes: 210SPM Pump Rate: 602GPM	6400	MD: 14,611' TVD: 7,058.3' Inclination: 89.73° Azimuth: 274.52° VS: 8,261.87'
14600-14660 SS: pred gy-gy wi sl brn hue, occ lt gy, gy-off wh, mod-mod w strd, vf-u f sb ang-sb rd grs, sli fri gr sup cls cons wi pred silic cnt, tr dolc strg, sl arg ip, tr vf pyr, non calc-si calc	7500	MD: 14,706' TVD: 7,059.05' Inclination: 89.36° Azimuth: 273° VS: 8,350.51'

SS: pred gy-gy wi sl brn hue, occ lt gy, strd, vf-u f grs grdg down to silt ip, sb arg sb ang-sb rd rd sli fri gr sup cls cmt, dolc strg ip, tr vf pyr, non-si	
14660-14720 SS: pred lt gy-gy, occ off wh, mod-mod w strd, vf-u f sb ang-sb rd grs, sli fri gr sup cls cons wi pred silic cnt, tr mx sup clus cons wi dolc strg, sl arg ip, tr vf pyr, non calc-si calc	
14720-14780 SS: lt gy-gy, occ off wh, mod-mod w strd, vf-u f sb ang-sb rd grs cons wi sli fri silic cnt, pred gr sup cls, tr mx sup clus cons wi dolc cnt, sl arg ip, tr vf pyr, non calc-si calc	



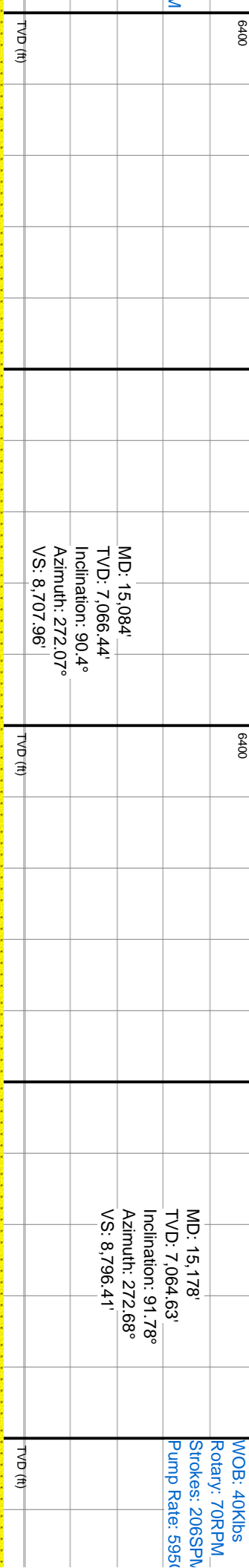
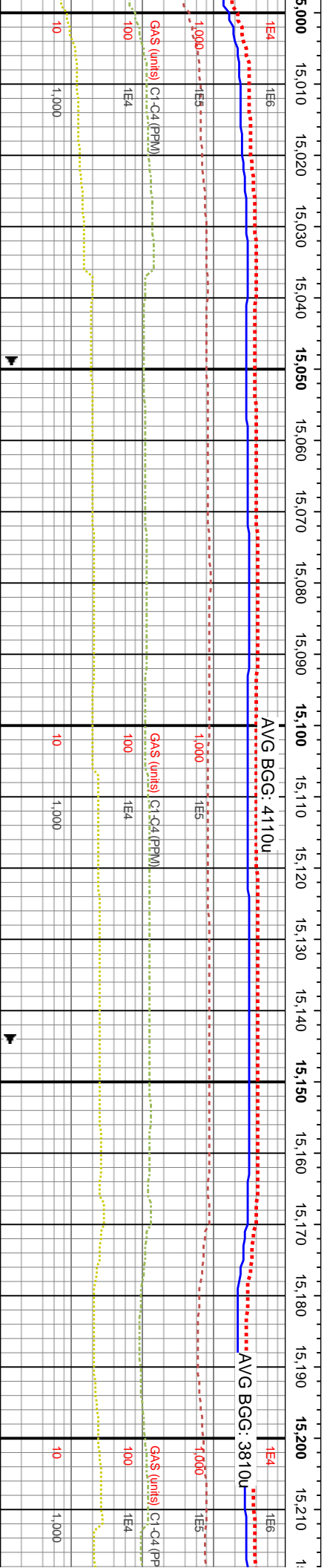
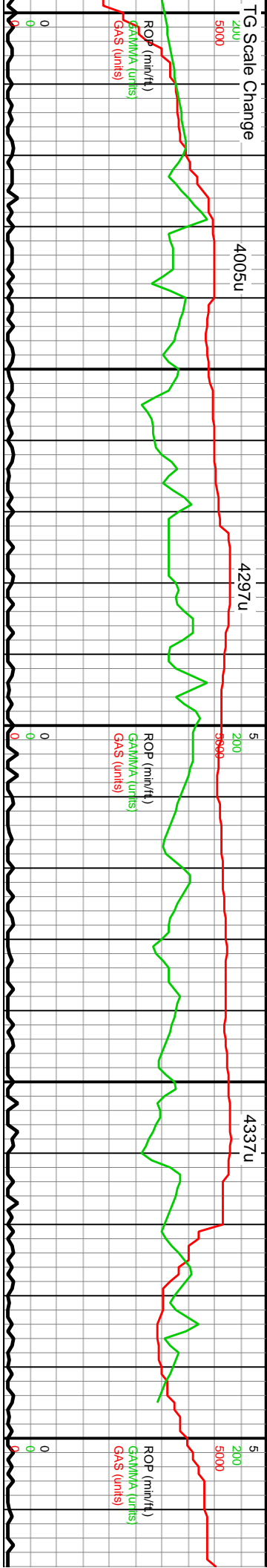
14780-14840 SS: pred lt gy-gy, occ off wh, mod-mod w strd, vf-u f sb ang-sb rd grs, sli fri gr sup cls cons wi pred silic cmt, rr mtx sup cls cons wi dolc strg, sl arg ip, tr vf pyr, non calc-si calc

14840-14900 SS: pred off wh-lt gy, occ gy, mod-mod w strd, vf-u f sb ang-sb rd grs, sli fri pred mtx sup cls cons wi dolc cmt, com gr sup sli fri cls cons wi silic cmt, rr dk slst strg, tr vf pyr, non calc-si calc

14900-14960 SS: pred off wh-lt gy, occ gy, rr dk slst strg, mod-mod w strd, vf-u f sb ang-sb rd grs, sli fri pred mtx sup cls cons wi dolc cmt, com gr sup sli fri cls cons wi silic cmt, tr vf pyr, non calc-si calc

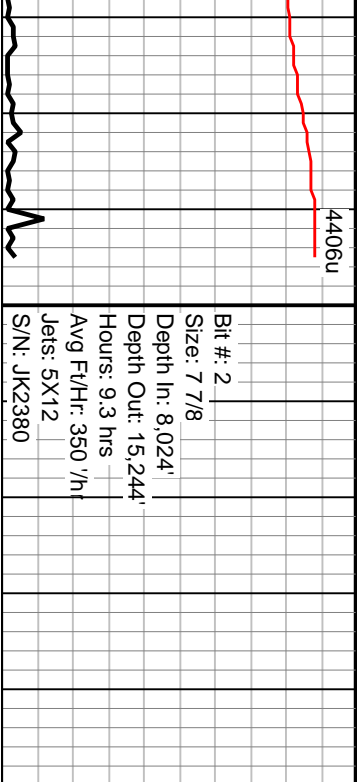
14960-15020 SS: pred rr dk slst strg, mod-mod w strd, vf-u f sb ang-sb rd grs, sli fri pred mtx sup cls cons wi dolc cmt, com gr sup sli fri cls cons wi silic cmt, tr vf pyr, non calc-si calc



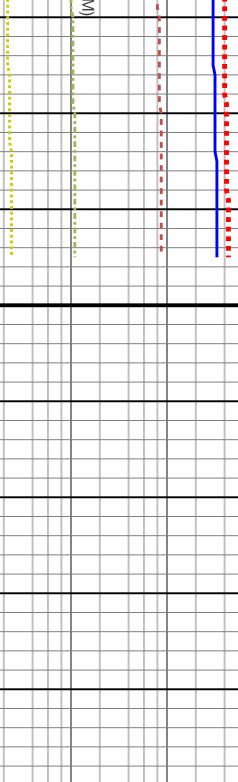
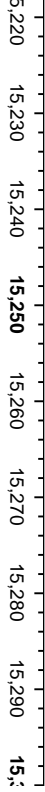


off wh-lt gy, occ gy, dk silst strg, mod-mod w srtcd, vf-u f sb ang-sb rd grs, sil fri pred mtx sup cls cons wi dolc cmt, com gr sup sil fri cls cons wi silc cmt, tr vf pyr, non calc-si calc	15020-15080 SS: pred off wh-lt gy, occ gy, rr silst strg, mod-mod w srtcd, vf-u f sb ang-sb rd grs, sil fri pred mtx sup cls cons wi dolc cmt, com gr sup sil fri cls cons wi silc cmt, tr vf pyr, non calc-si calc	15080-15140 SS: pred off wh-lt gy, occ gy, rr dk silst strg, mod-mod w srtcd, vf-u f sb ang-sb rd grs, sil fri pred mtx sup cls cons wi dolc cmt, com gr sup sil fri cls cons wi silc cmt, tr vf pyr, non calc-si calc	15140-15200 SS: pred gy- gy brn trnsi, sme br- offwht, pred sb biky- occ lse grs, sl frm- sft, pred v f- occ f grd cons sd, pred sb mnd- ang, ip lse sd grs, sl calc, sme lse sil- ang cmt, tr pyr	15200-15244 SS: sme br- offwht, p grs, sl frm- sft, pr sd, pred sb mnd- e calc, sme lse sil-
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Bit #: 2	
Size: 7 7/8	
Depth In: 8,024'	
Depth Out: 15,244'	
Hours: 9.3 hrs	
Avg Ft/Hr: 350 'hr	
Jets: 5X12	
S/N: JK2380	



DP @ 15,240'

****Projected****

MD: 15,244'

Inclination: 91.78°

Azimuth: 272

**TD Reached
@ 0600hrs
on 10-12-15**

pred gy- gy bmn trnsl,
ed sb blkly- occ lse
ed v f- occ f grd cons
ang, ip lse sd grs, sl
arg cmt, tr pyr