



Empirica

Scale: 5" / 100'
Measured Depth Log

Well Name DT Habitat_C4-5-6

Location Sec.5-T05N-R65W

State Colorado

Country USA

API Number 05-123-1027-00

Region DJ Basin

Spud Date 4/6/2015

Surface Coordinates SHL: 398°FNL, 1684°FEL, Sec.05

Lat: 40.468733

Long: 104.68373

County Weld

Rig Number Savanna 802

AFE # N/A

Field Wattenberg

Drilling Completed 4/12/2015

Bottom Hole Coordinates BHL: 2179°FNL, 460°FWL, Sec. 06

Ground Elevation 4,640'

K.B. Elevation 4,655'

Logged Interval 6,800' To 14,911'

Total Depth 14,911'

Formation Codell Sand

Type of Drilling Fluid Water Based

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-461 (to curve TD); ML

Comments Start: 4-7-15
Standby: 4-13-15

TD: TBD

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

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 Sy

O ORGANIC

P PINPOINT

D DEAD

EVEN

QUESTIONABLE

SPOTTED STAINING

GAS SH

MINDEPTH

V VUGGY

NORMAL

OIL SH

OVERTURN

Engineering

CASING

REVERS

Porosity

E EARTHY

F FENESTRAL

F FRACTURE

X INTERCRYSTALLINE

I INTEROOLITIC

M MOLDIC

CONNECTION (RIGHT)

CONNECTION GAS

CORE - LOST

CORE - RECOVERED

DST INTERVAL

FAULT

SIDEWA

SLIDE

SURV

TRIP C

WIRELIN

WIRELIN

-321 (to TD)

Vatkins

wy N

Symbols

FORMATION TOP L LITHOGRAPHIC

Rounding

HOW MX MICROXLN

MIN DEPTH AN ANGULAR MS MUDSTONE

FL FAULT R ROUNDED PS PACKSTONE

DW B SUBANG WS WACKESTONE

TURNED STRATA N SUBRND

Sorting

DEFAULT

Textures

LL CORE (LEFT) M MODERATE

LL CORE (RIGHT) BS BOUNDSTONE P POOR

C CHALKY W WELL

EY CX CRYPTOXLN

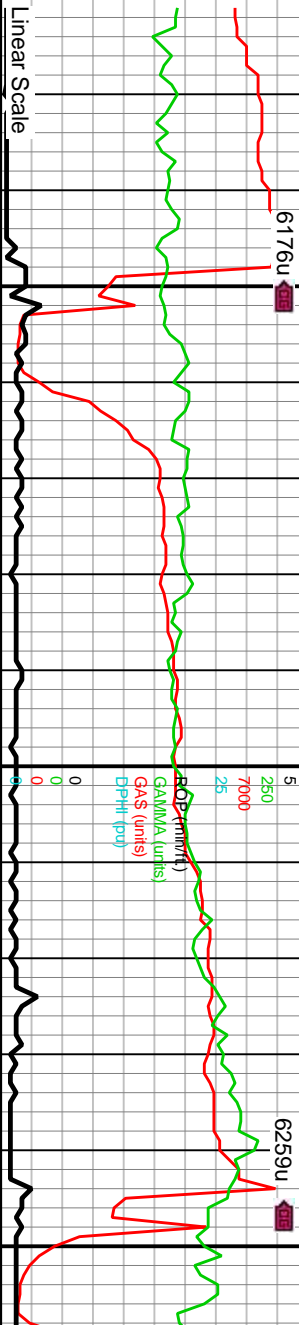
SAS E EARTHY

IE TESTED - LEFT FX FINELYXLN

IE TESTED - RT GS GRAINSTONE

ROP
GAMMA
GAS
DPHI

Extraction OG DT Habitat C4-5-6
Well County, Colorado
Spud Date: 4-6-15
Surface Casing @ 1,024'
Intermediate Casing @ x,xxx
2-man Logging / Geosteering Began: 4-7-15

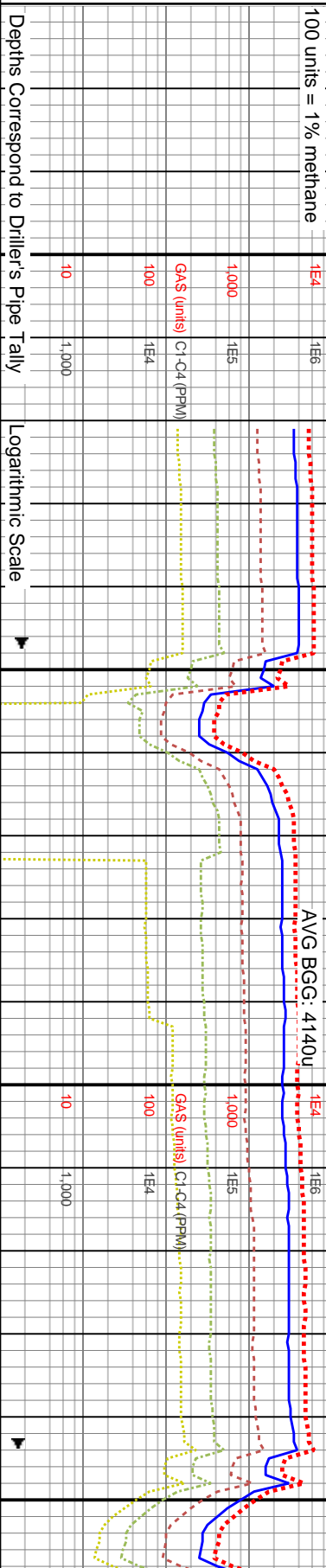


Slide/Rotate

Depth Labels

Total Gas & Chromatograph

GAS
C1
C2
C3
C4



Depths Correspond to Driller's Pipe Tally

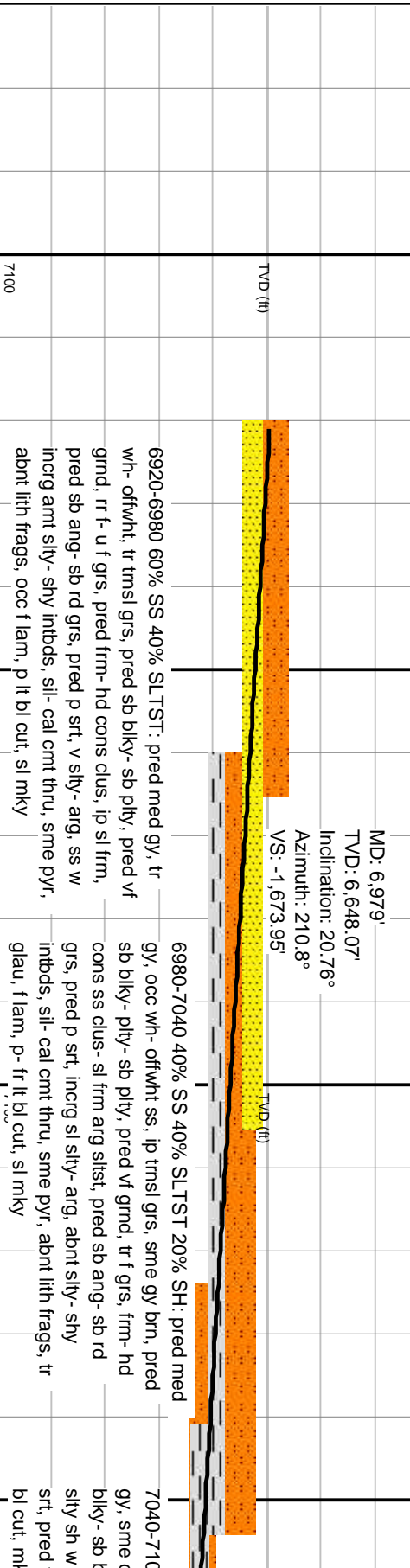
WOB: 65Klbs

Rotary: 0RPM

Strokes: 210SPM

Pump Rate: 629GPM

Well Bore
TVD

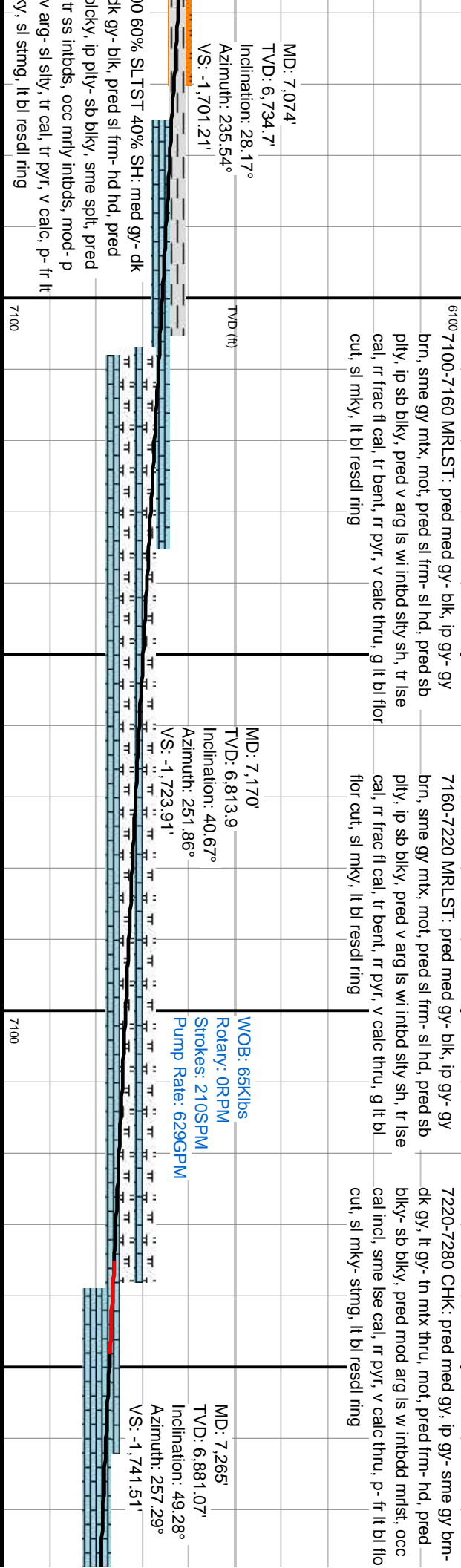
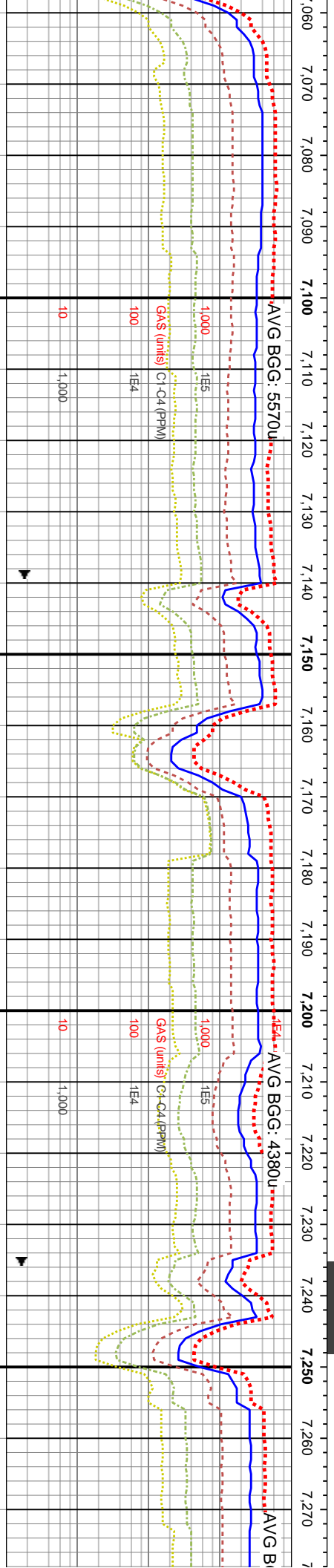
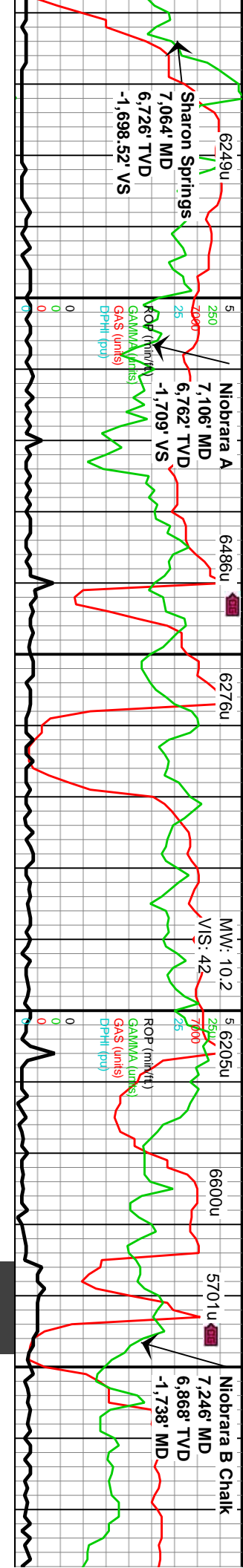


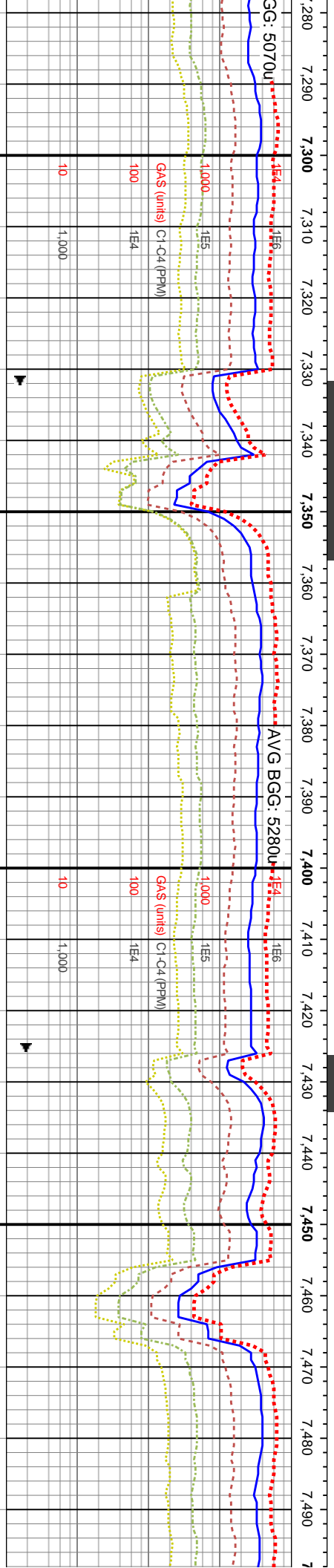
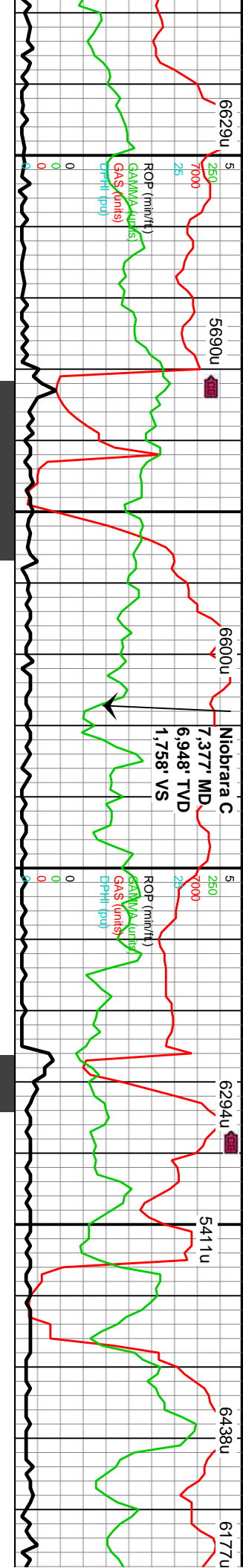
Oil Show

100
1000
10000

Images





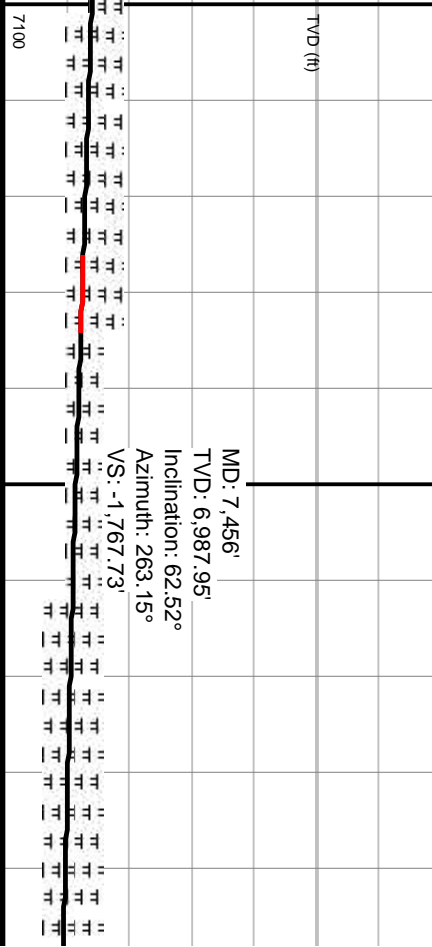
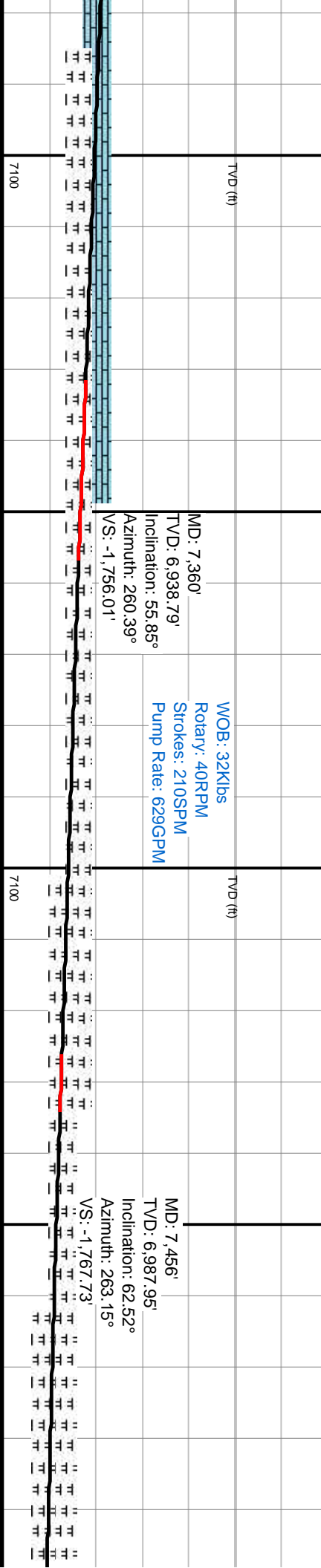


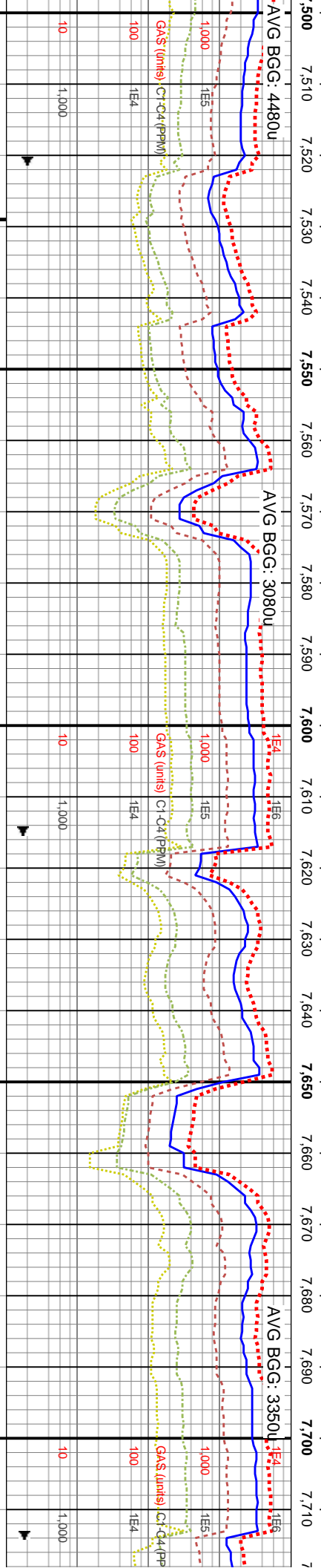
7280-7340 70% CHK 30% MRLST: pred dk gy-blk, sme med gy- dk gy brn, sme gy mtb, mot thru, pred sl frm- sl hd, pred blk- sb blk, ip sb plty, pred v arg ls w intbdd mrlst, incrg arg, abnt cal incl, sme lse cal, tr pyr, v calc thru, p- fr lt bl flr cut, sl mky- stmg, lt bl resd ring

7340-7400 40% CHK 40% MRLST 20% SLTST : pre gy- med gy, sme offwht-lt gy, occ tn-lt brn, sft- hd, pred sb plty- sb blk, arg ls w mrl- slty intbds, tr pyr, tr bent, sme cal incl- frac fl cal, fr lt bl cut, sl mky, lt gn- bl resd ring

7400-7460 40% CHK 40% MRLST 20% SLTST : pre gy- med gy, sme offwht-lt gy, occ tn-lt brn, sft- hd, pred sb plty- sb blk, arg ls w mrl- slty intbds, tr pyr, tr bent, sme cal incl- frac fl cal, fr lt bl cut, sl mky, lt gn- bl resd ring

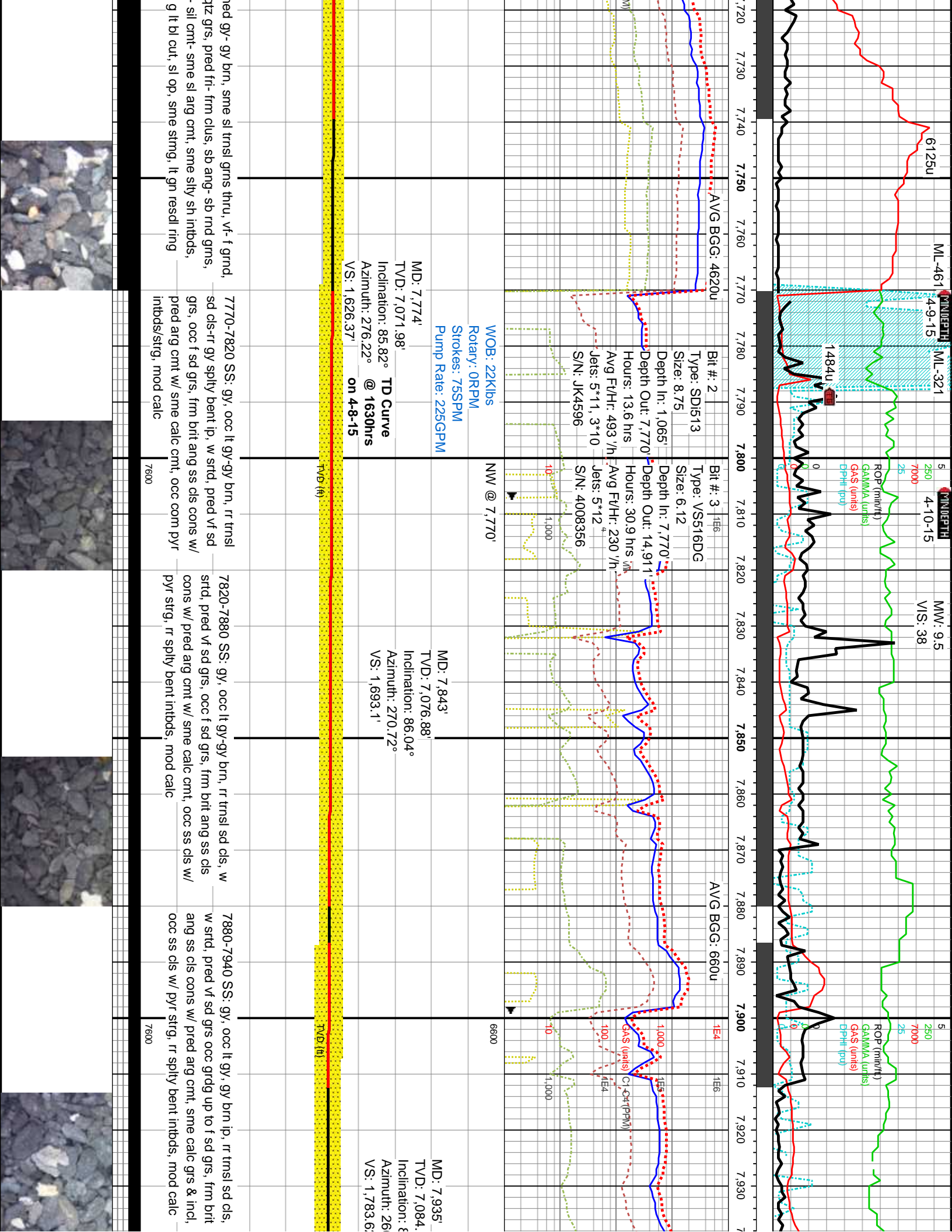
7460-7520 70% LS 30% offwht- tn, sme gy- me mudst w intbdd mrlst, th bl flr cut, sl mky, lt bl r

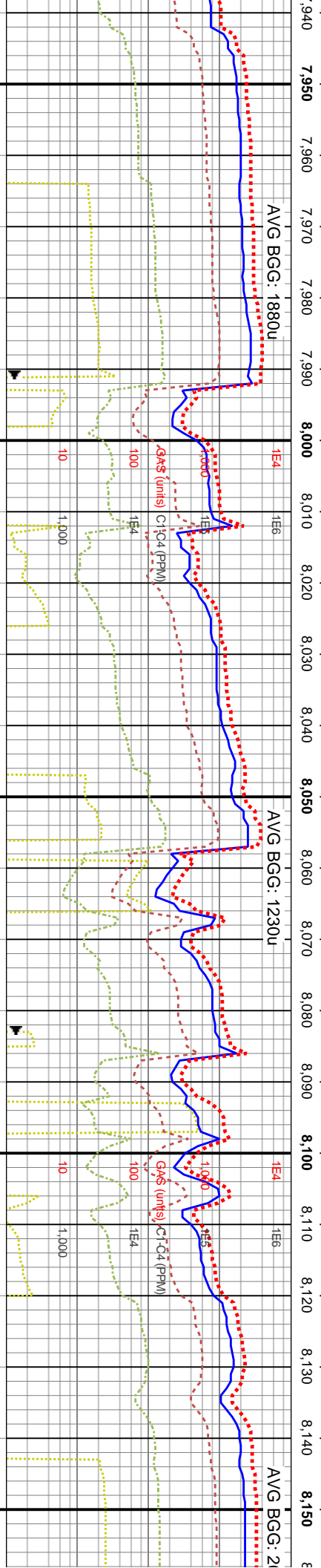




Interval	Stratigraphic Unit	Core Description	Core Number
7520-7580	LS	pred offwhit- tn, sme gy- med gy, hd, sb blkly, mudst w sme intbdd mlst, tr bent, tr pyr, rr ss, p- fr lt bl flor cut, sl mky, lt bl resdl ring	7600
7580-7640	LS	pred offwhit- tn, sme gy- med gy, hd, sb blkly, mudst w sme intbdd mlst, tr bent, tr pyr, p- fr lt bl flor cut, sl mky, lt bl resdl ring	7600
7640-7700	SS	med gy- gy brn, sme sl trnsi grns thru, vf- f gmd, pred fri- frm clus, sb ang- sb rmd grns, mod- p strd, calc- sil cmt- sme sl arg cmt, about lith frags, fr- g lt bl cut, sl op, sme strng, lt gn resdl ring	7600
7700-7770	SS	fr med ang trnsi a mod- p strd, calc- sil cmt, about lith frags, fr-	7600







AVG BGG: 1230u

AVG BGG: 21

MD: 8.028

MD: 8,120

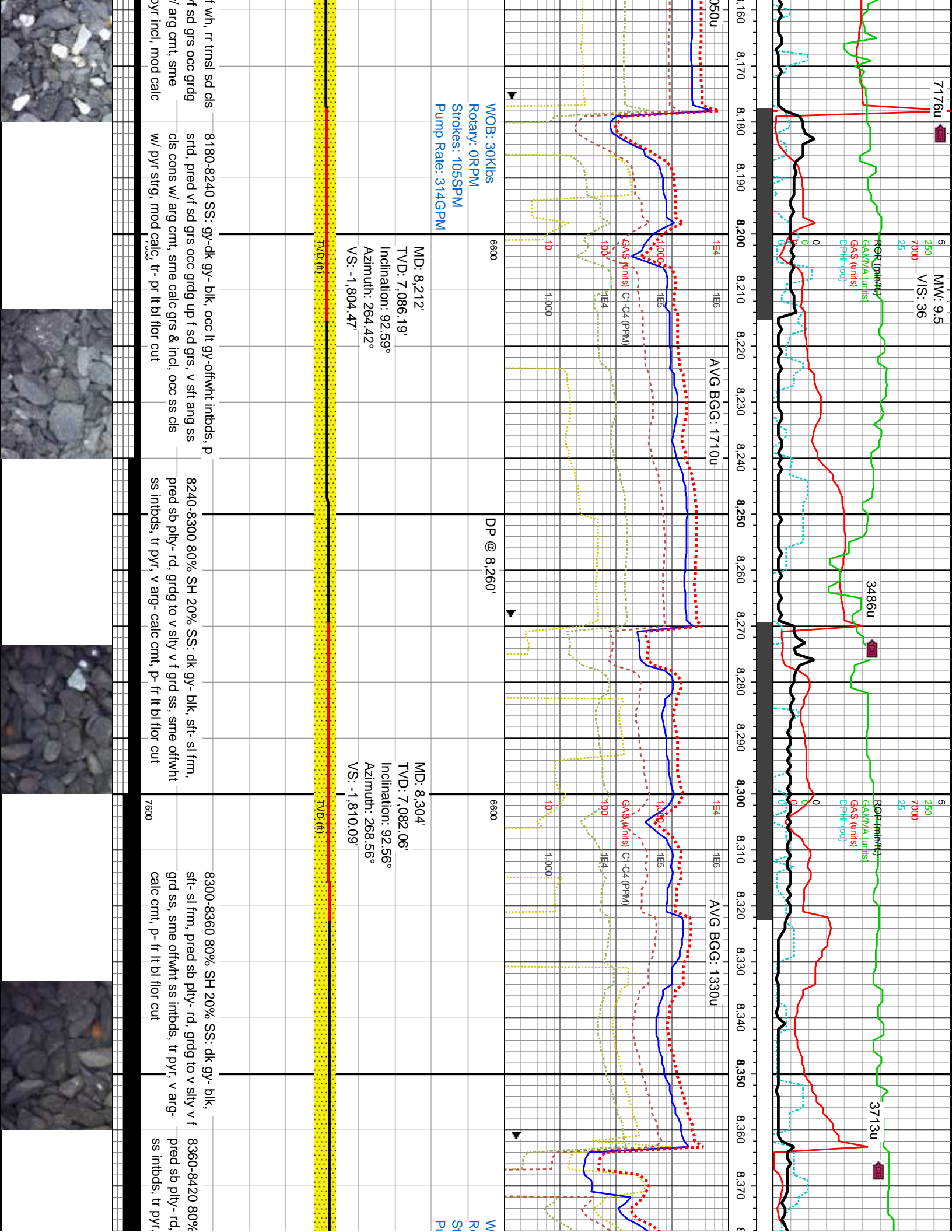
TV/D: 7,090.19'				IV/D: 7,090.21'
Inclination: 87.55°				Inclination: 92.42°
Azimuth: 263.98°				Azimuth: 261.08°
VS: 1,875.93'				VS: 1,967.75'

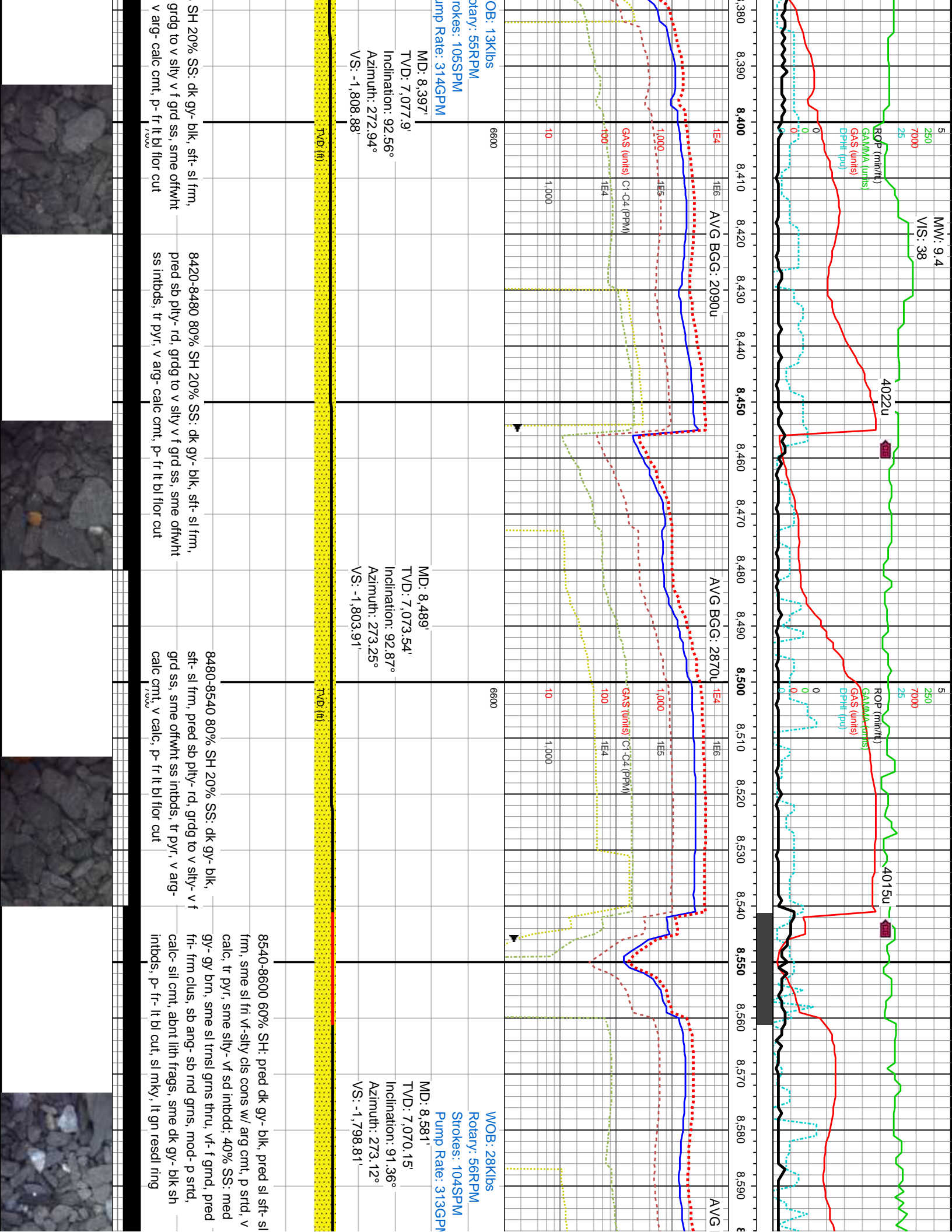
8000-8060 SS: gy, occ It-gy-off wh-dk gy, r trmsl sd clst
& thin clst ss intbds, w strd, pied v/ sd grs occ grdy up
to f sd grs ip, ang ss clst cons w/ pied arg cmt, sme
calc grs & incl, r calc cmt, occ pyr strg, mod calc, w/ r
SH intbds: dk gy, frm, brit, hi fls, sm-si silty tex

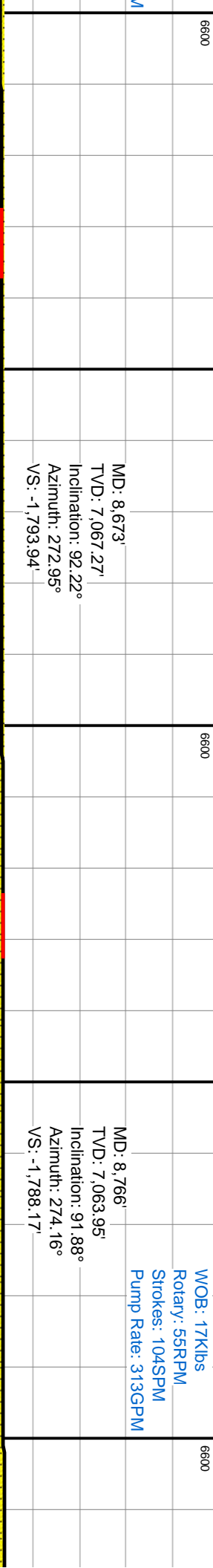
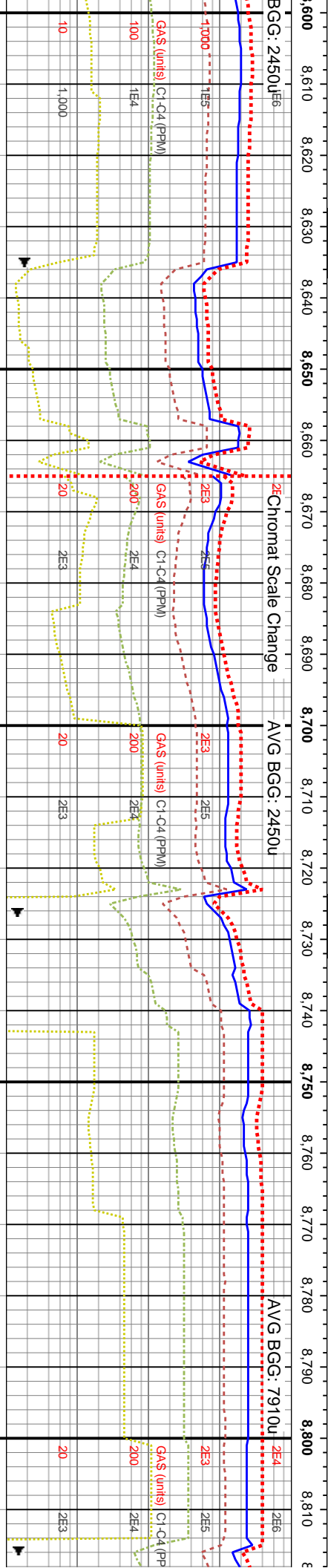
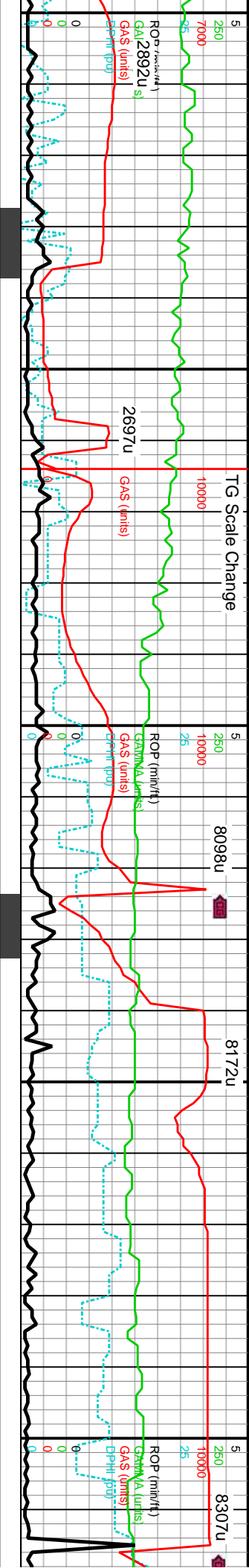
8060-8120 SS: gy-dk gy, tr lt gy-off wh, r tmsl sd cls & tr thn clr ss intbds, w srid, pied vf sd grs occ grdg up to f sd grs ip, ang ss cls cons w/ ang cmt, sme calc grs & incl, occ pyr strg & vf pyr incl, mod calc

8120-8180 SS: gy-dk gy, tr tr gy-of
& tr thn clr ss inthbds, w srtid, pred v
up to f sd grs ip, ang ss cls cons w
calc grs & incl, occ c pyr strg & v f r



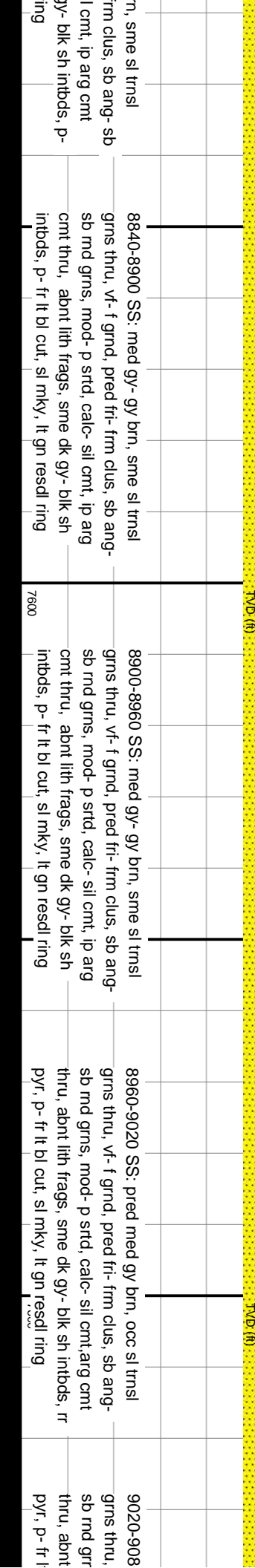
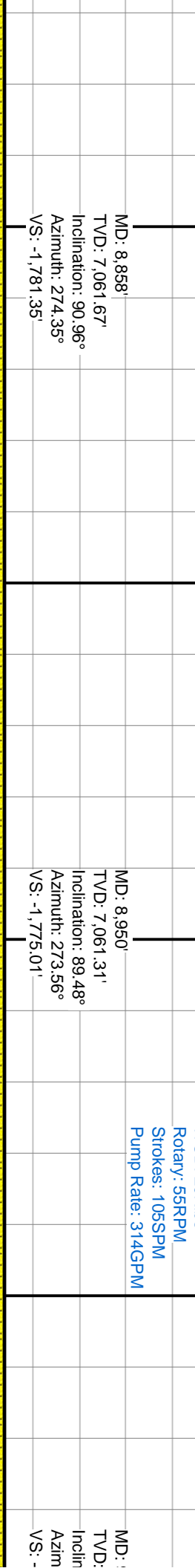
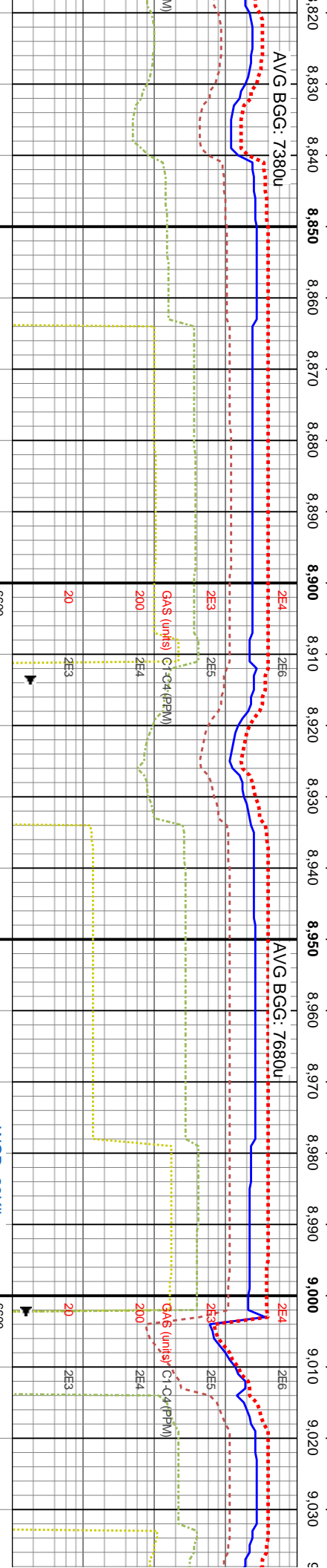
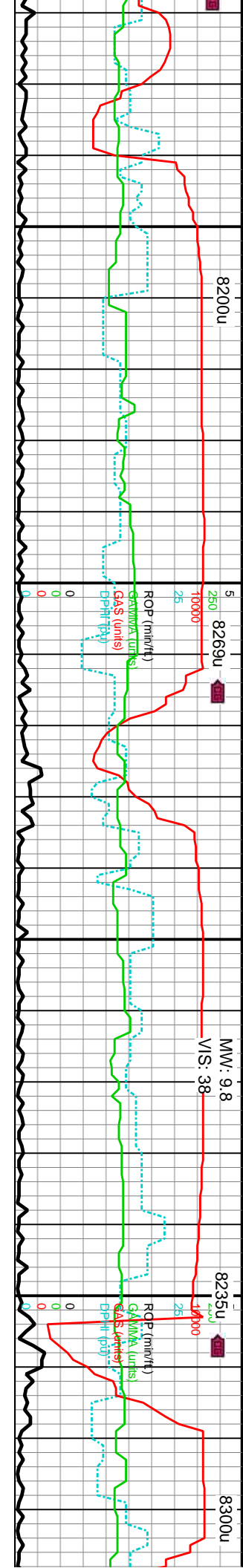


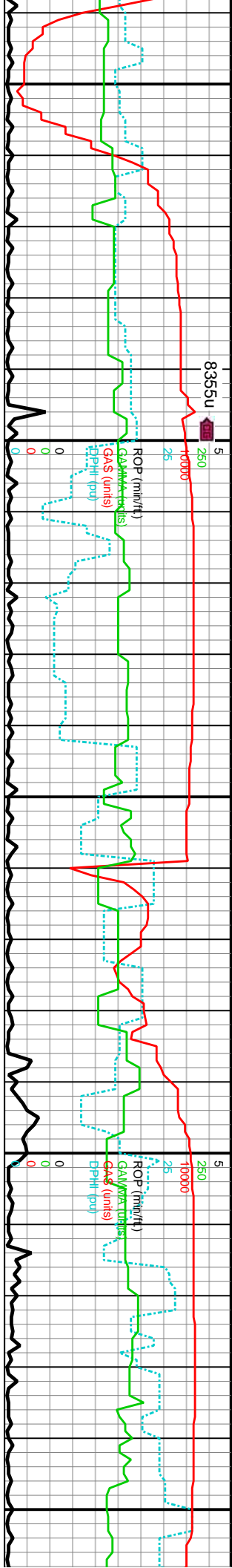




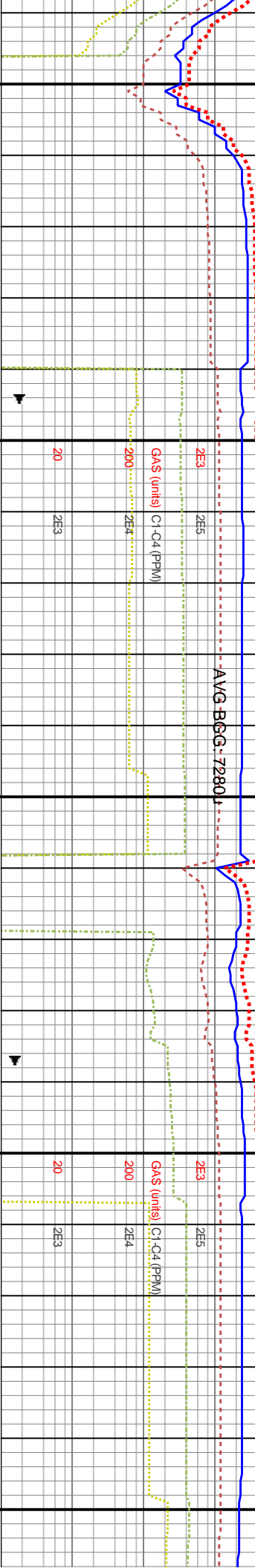
8600-8660 60% SH: pred dk gy- blk, pred sl sft- sl frm, sme sl fri vf-silty cls cons w/ arg cnt, p srted, v calc, tr pyr, sme silty- vf sd intbdd; 40% SS: med gy- gy brn, sme sl trnsi grns thru, vf- f gmd, pred fri- frm clus, sb ang- sb rnd grns, mod- p srted, calc- sil cnt, abt lith frags, sme dk gy- blk sh intbds, p- fr- it bl cut, sl mky, lt gn resdl ring	8660-8720 60% SH: pred dk gy- blk, pred sl sft- sl frm, sme sl fri vf-silty cls cons w/ arg cnt, p srted, v calc, tr pyr, sme silty- vf sd intbdd; 40% SS: med gy- gy brn, sme sl trnsi grns thru, vf- f gmd, pred fri- frm clus, sb ang- sb rnd grns, mod- p srted, calc- sil cnt, abt lith frags, sme dk gy- blk sh intbds, p- fr- it bl cut, sl mky, lt gn resdl ring	8720-8780 SS: med gy- gy brn, sme sl trnsi grns thru, vf- f gmd, pred fri- frm clus, sb ang- sb rnd grns, mod- p srted, calc- sil cnt, ip arg cnt thru, abt lith frags, sme dk gy- blk sh intbds, p- fr it bl cut, sl mky, lt gn resdl ring	8780-8840 SS: med gy- gy brn, sme sl trnsi grns thru, vf- f gmd, pred fri- frm clus, sb ang- sb rnd grns, mod- p srted, calc- sil cnt, abt lith frags, sme dk gy- blk sh intbds, p- fr it bl cut, sl mky, lt gn resdl ring
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AVG BGG: 5600u



9,042'
7,060.77'
ation: 91.2°
uth: 273.76°
1,769.13'

TVD (ft)

0 SS: pred med gy brn, occ sl trns
v- f grnd, pred fri- frm clus, sb ang-
s, mod- p strd, calc- sil cnt,arg cnt
lith frags, sme dk gy- blk sh intbds, rr
fr lt bl cut, sl mky, lt gn resdl ring

9080-9140 SS: pred med gy brn, occ sl trns
grns thru, v- f grnd, pred fri- frm clus, sb ang- sb
md grns, mod- p strd, calc- sil cnt,arg cnt thru,
abt lith frags, sme dk gy- blk sh intbds, rr pyr, p-
fr lt bl cut, sl mky, lt gn resdl ring

9140-9200 SS: pred med gy brn, occ sl trns
grns thru, v- f grnd, pred fri- frm clus, sb ang- sb
md grns, mod- p strd, calc- sil cnt,arg cnt thru,
abt lith frags, sme dk gy- blk sh intbds, rr pyr, p-
fr lt bl cut, sl mky, lt gn resdl ring

9200-9260 SS: pred med gy brn, abt sl trns
grns thru, v- l c grnd, pred fri- frm clus, ip
uncons l med grs, occ l c grs, sb ang- sb md
grns, p strd, calc- sil cnt, arg cnt thru, abt lith
frags, sme dk gy- blk sh intbds, rr pyr, p- fr lt bl
cut, sl mky, lt gn resdl ring

TVD (ft)

MD: 9,134'

TVD: 7,058.64'

Inclination: 91.45°

Azimuth: 273.02°

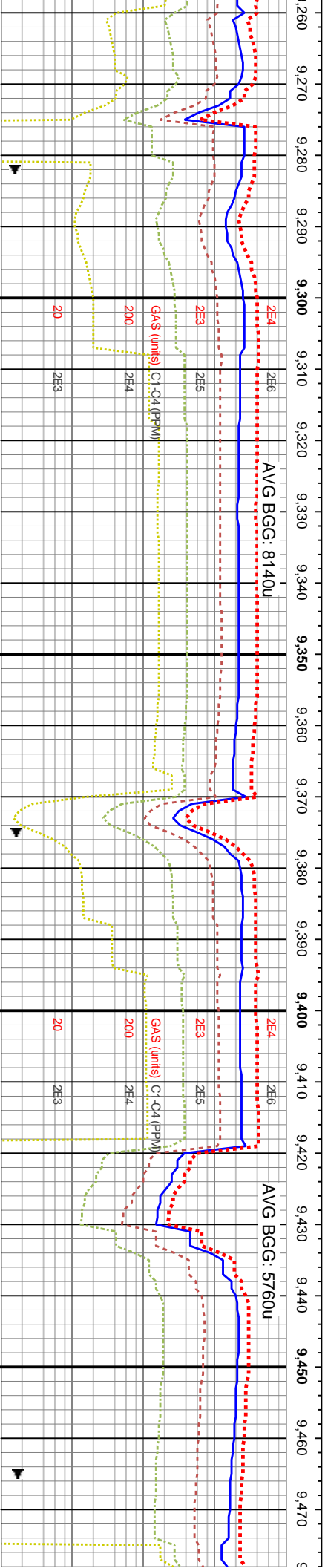
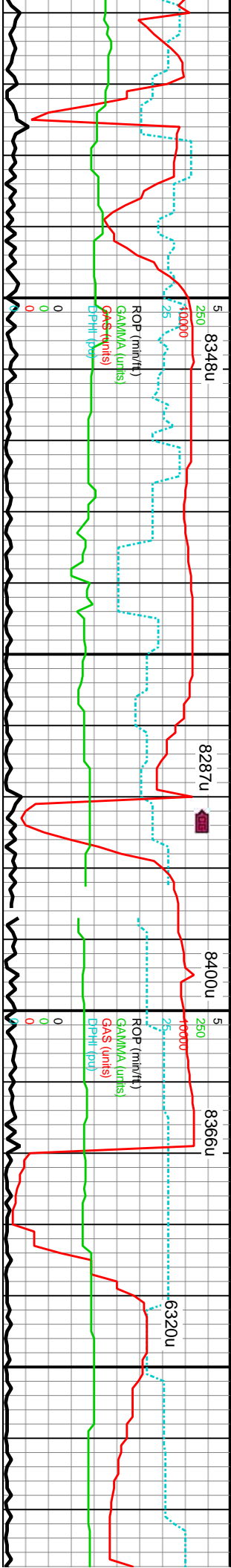
VS: -1,763.69'

WOB: 53Klbs
Rotary: 0RPM
Strokes: 105SPM
Pump Rate: 314GPM

TVD (ft)

MD: 9,227'
TVD: 7,056.24'
Inclination: 91.51°
Azimuth: 272.54°
VS: -1,759.19'

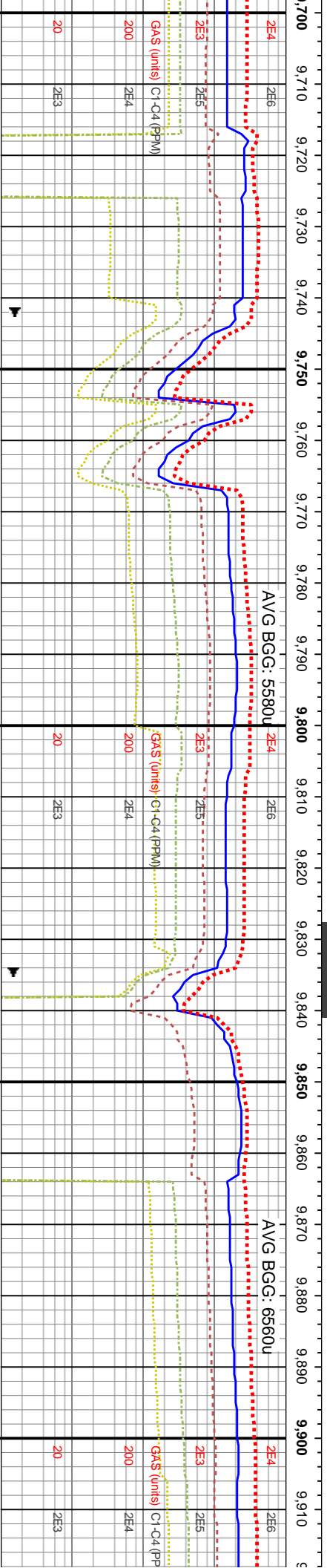
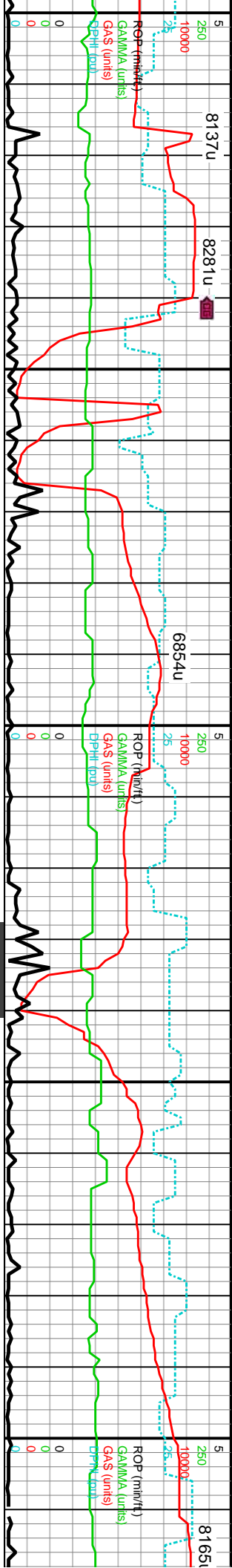
AVG BGG: 8140u



2E4	2E5	2E6	AVG BGC: 8140u	2E4	2E5	2E6	AVG BGC: 5760u
2E3	2E5	2E6		2E3	2E5	2E6	
GAS (units)	C1-C4 (PPM)	GAS (units)	C1-C4 (PPM)	GAS (units)	C1-C4 (PPM)	GAS (units)	C1-C4 (PPM)
200	2E4	200	2E4	200	2E4	200	2E4
20	2E3	20	2E3	20	2E3	20	2E3
6600		6600		6600		6600	
MD: 9,319' TVD: 7,054.53' Inclination: 90.62° Azimuth: 272.6° VS: -1,755.06'				WOB: 16Klbs Rotary: 70RPM Strokes: 105SPM Pump Rate: 314GPM			
TVD: (ft)				TVD: (ft)			

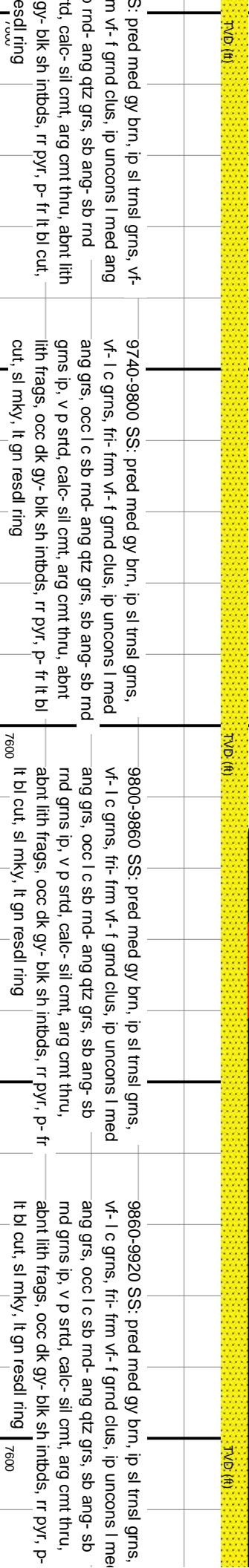
9260-9320 SS: pred med gy brn, abnt sl tmsl grns thru, vfr- l c grnd, pred fri- frm clus, ip uncons l med grs, occ l c grs, sb ang- sb md grns, p strd, calc- sil cnt, arg cnt thru, abnt lith frags, sme dk gy- blk sh intbds, rr pyr, p- fr lt bl cut, sl mky, lt gn resdl ring	9320-9380 SS: pred med gy brn, abnt sl tmsl grns thru, vfr- l c grnd, pred fri- frm clus, ip uncons l med grs, occ l c grs, sb ang- sb md grns, p strd, calc- sil cnt, arg cnt thru, abnt lith frags, sme dk gy- blk sh intbds, rr pyr, p- fr lt bl cut, sl mky, lt gn resdl ring	9380-9440 SS: pred med gy brn, ip sl tmsl grns, vfr- l c grns, pred fri- frm vfr- f grnd clus, hi ip uncons l med ang grs, occ l c sb md- ang qtz grs, sb ang- sb md grns ip, v p strd, calc- sil cnt, arg cnt thru, abnt lith frags, sme dk gy- blk sh intbds, rr pyr, p- fr lt bl cut, sl mky, lt gn resdl ring	9440-9500 SS: pred med gy brn, l c grns, pred fri- frm vfr- f grnd clus, med ang grs, occ l c sb rnd- ang sb md grns ip, v p strd, calc- sil c abnt lith frags, sme dk gy- blk sh lt bl cut, sl mky, lt gn resdl ring
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WOB: 28kIbs	
Rotary: 70RPM	
Strokes: 105SPM	
D _{avg} Rate: 314GPM	
MD: 9,780'	
TVD: 7,056.42'	
Inclination: 88.95°	
Azimuth: 275.02°	
VS: -1,726.7'	

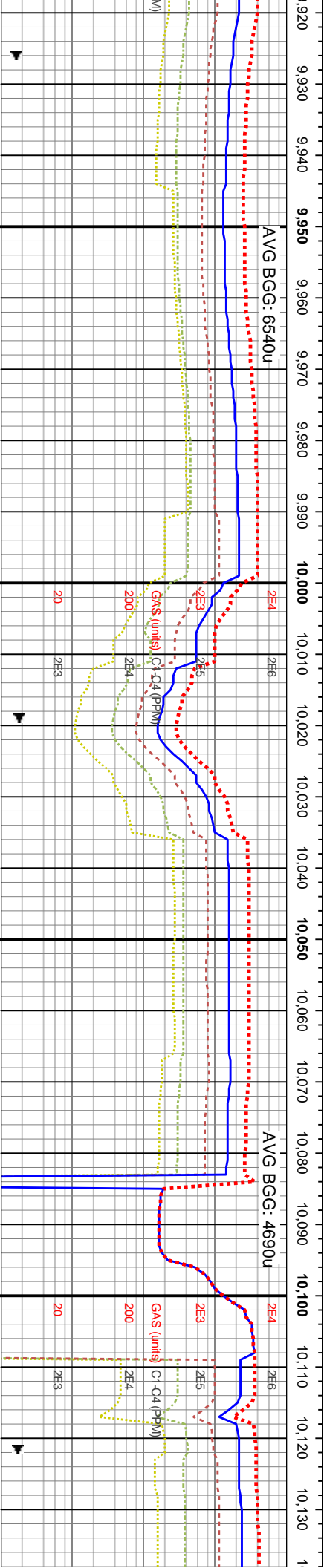
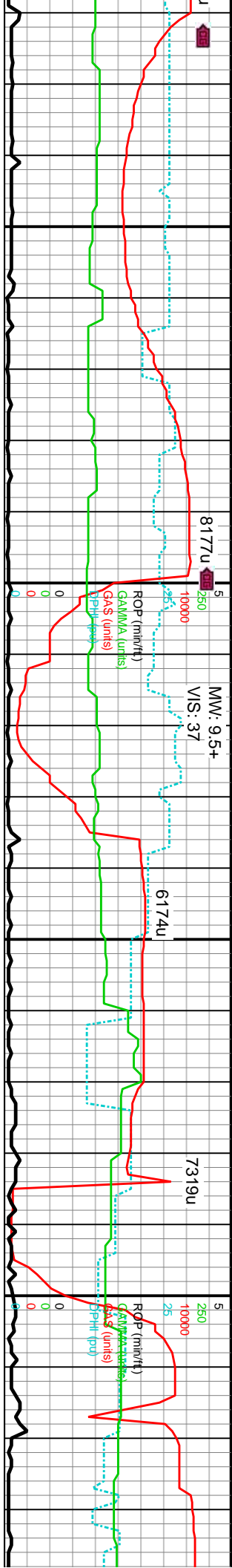
MD: 9,872'
TVD: 7,057.78'
Inclination: 89.35°
Azimuth: 275.17°
VS: -1,718.53'



9740-9800 SS: pried med gy brn, ip sl frnsi grms, vf- l c grms, fr- frm vf- f gmd clus, ip uncons l med ang grs, occ l c sb md-ang qtz grs, sb ang-sb md grms ip, v p sftd, calc-sil cmt, arg cmt thru, abt frs frags, occ dk gy- blk sh intbds, rr pyr, p- fr fr bl cut, sl mky, lt gn resal ring

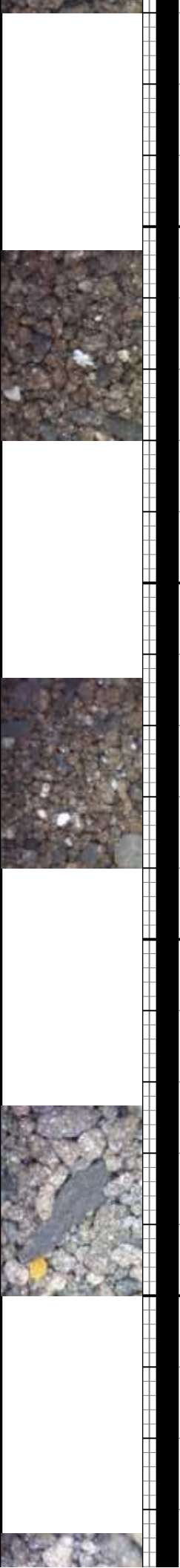
9860-9860 SS: pred med gy brn, ip sl trnsi grms, vf- l c gcc, fr- frm vf- f gmd clus, ip unconsl l med ang grs, occ l c sb rnd- ang qtz grs, sb ang- sb rnd grms jp, v p strd, calc- sil cmt, ang cnt thru, abt lth frags, occ dk gy- blk sh intbds, rr pyr, p- fr lt bl cut, sl mky, lt gn resdl ring

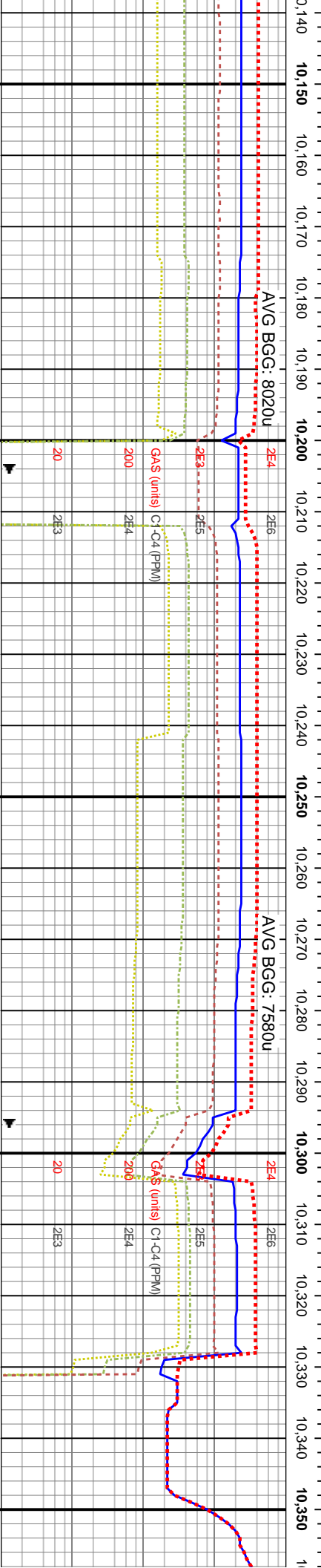
It bl cut, sl mky, It gn resdrl ring 7600



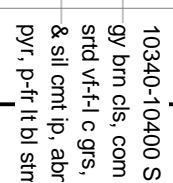
WOB: 27Klbs Rotary: 70RPM Strokes: 105SPM Pump Rate: 314GPM		6600
MD: 9,964' TVD: 7,058.46' Inclination: 89.81° Azimuth: 275.28° VS: -1,710.15'		
TVD (ft)		
		6600
MD: 10,057' TVD: 7,058.64' Inclination: 89.97° Azimuth: 275.18° VS: -1,701.67'		
TVD (ft)		
		6600

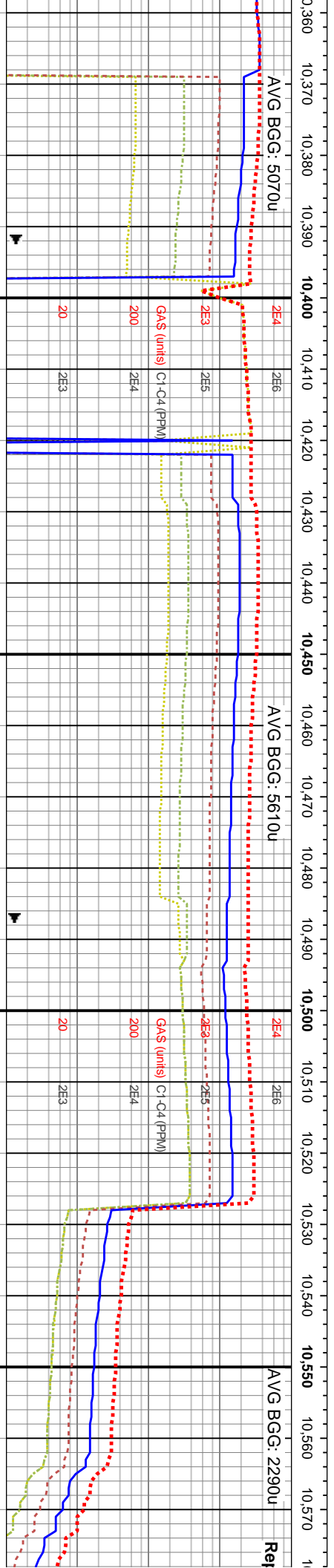
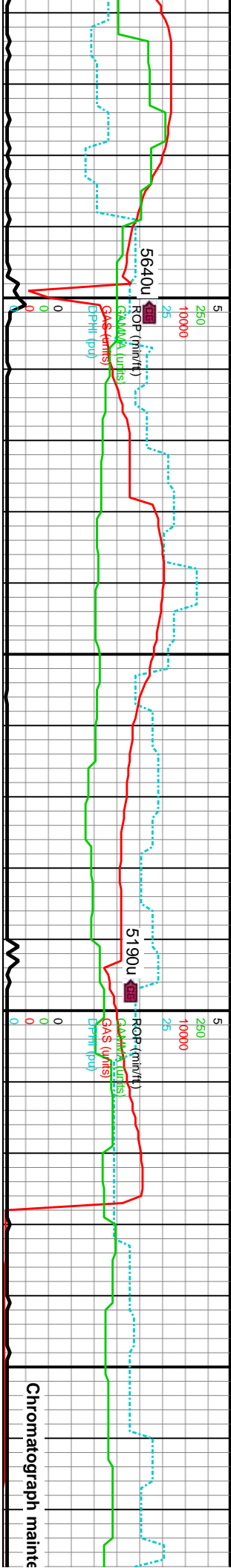
9920-9980 SS: pred med gy brn, ip sl trnsI grns, vf- l c grns, fr- frm vf- f grnd clus, ip uncons l med ang grs, occ l c sb rnd- ang qtz grs, sb ang- sb rnd grns ip, v p strd, calc- sil cnt, arg cnt thru, abnt lith frags, occ dk gy- blk sh intbds, rr pyr, p- fr lt bl cut, sl mky, lt gn resdl ring	9980-10040 SS: pred med gy brn, ip sl trnsI grns, vf- l c grns, fr- frm vf- f grnd clus, ip uncons l med ang grs, occ l c sb rnd- ang qtz grs, sb ang- sb rnd grns ip, v p strd, calc- sil cnt, arg cnt thru, abnt lith frags, occ dk gy- blk sh intbds, rr pyr, p- fr lt bl cut, sl mky, lt gn resdl ring	10040-10100 SS: pred med gy brn, com trnsI off wh-clr f grs thru, mod w strd vf-l c grs, sil fri cls cons w/ arg cnt & sil cnt ip, abnt lith frags, occ dk gy-blk sh intbds, rr pyr, fr lt bl strng cut, lt gn resdl ring	10100-10160 SS: pred med gy brn wh-clr f grs thru, mod w strd vf-l c g w/ arg cnt & sil cnt ip, abnt lith frags, splty sh/sh intbds, rr pyr, fr lt bl strng ring
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MD: 10,336'
TVD: 7,058.12'
Inclination: 90.12°
Azimuth: 275.13°
VS: 4,118.14'

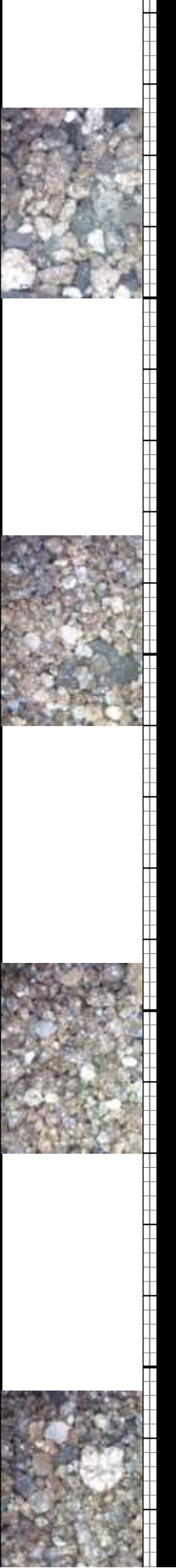


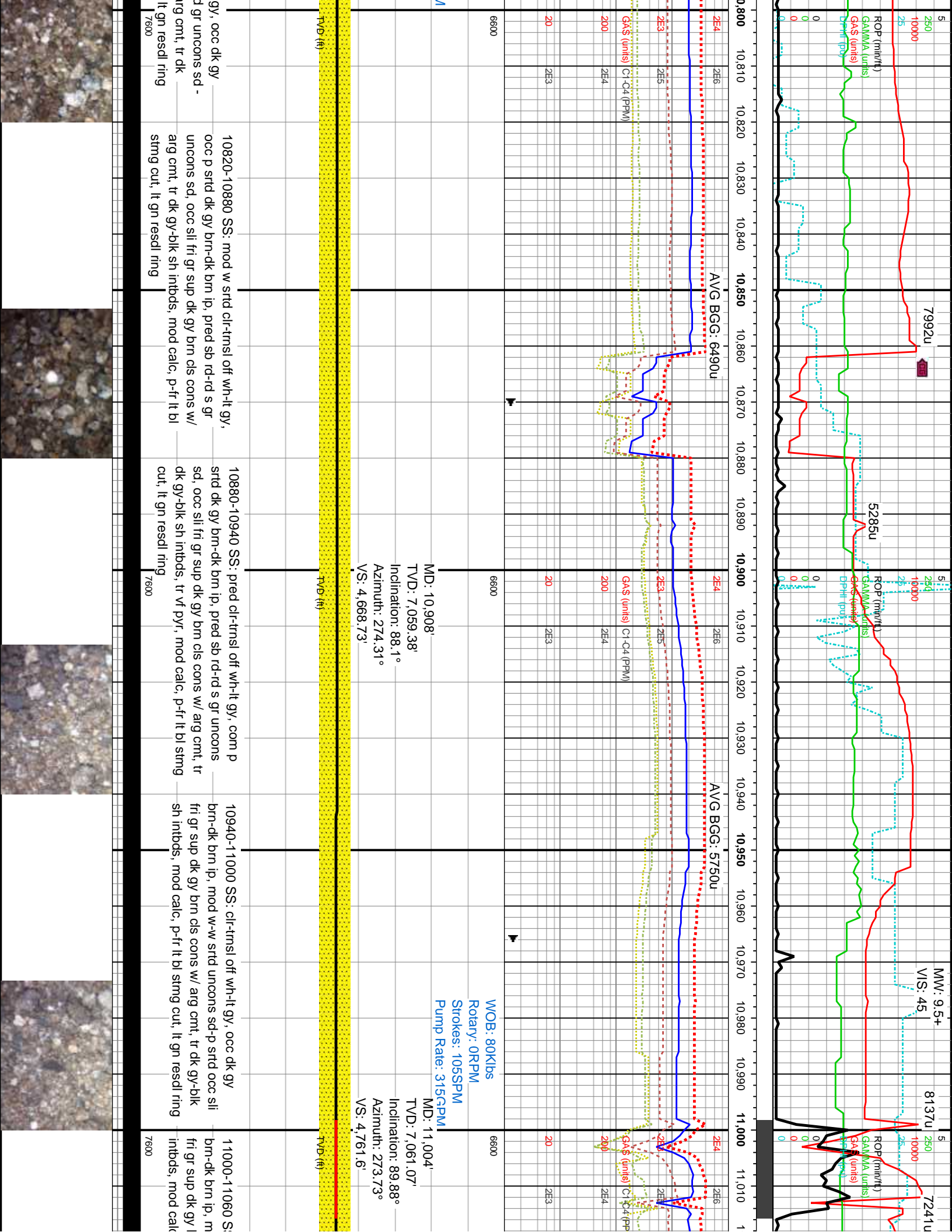


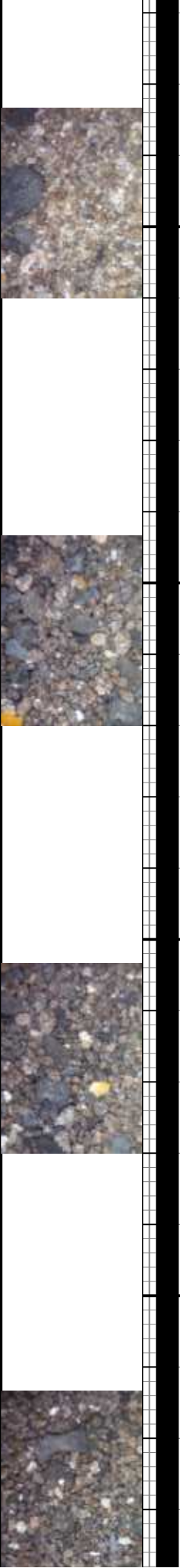
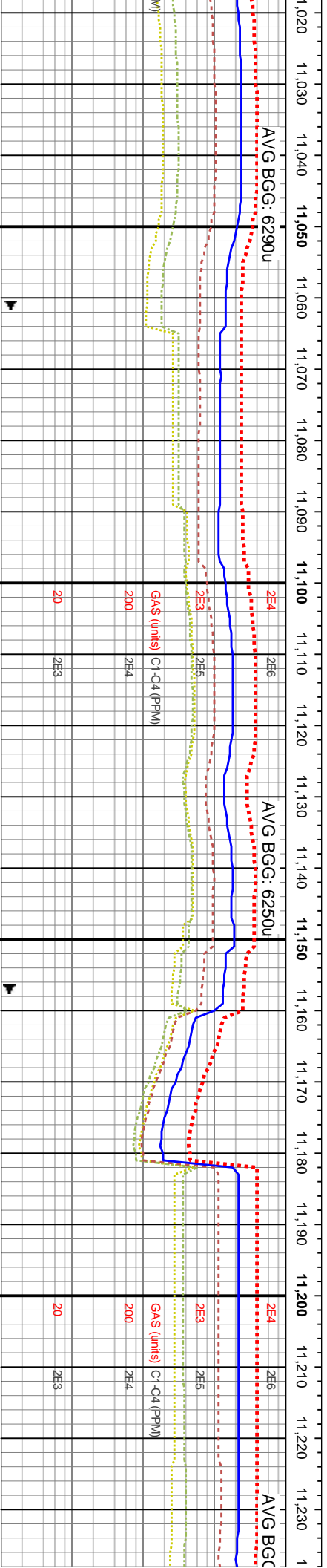
WOB: 10Klbs
Rotary: 70RPM
Strokes: 105SPM
Pump Rate: 314GPM

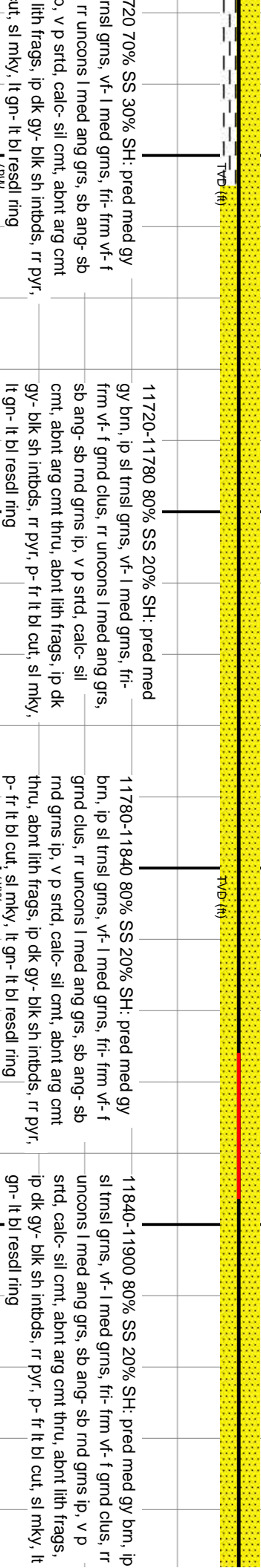
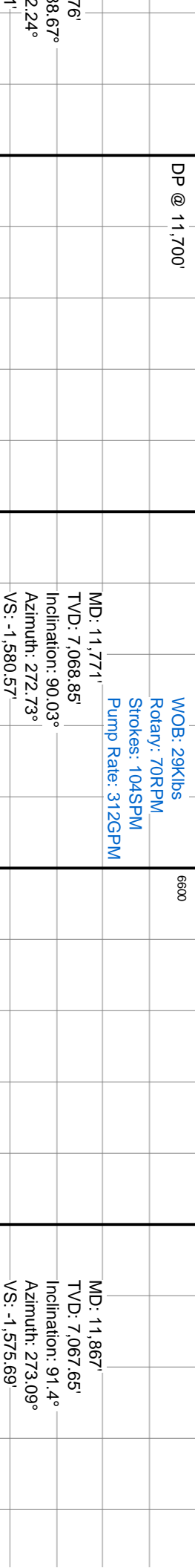
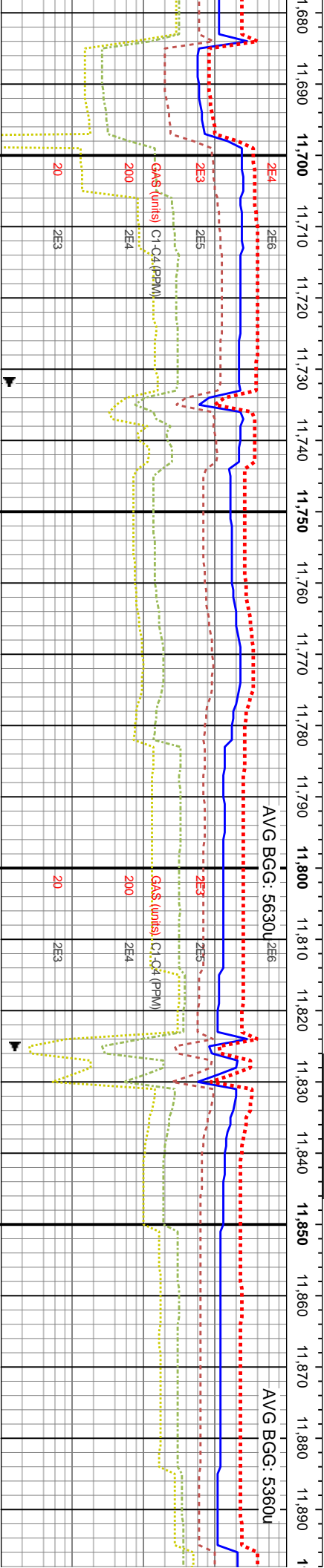
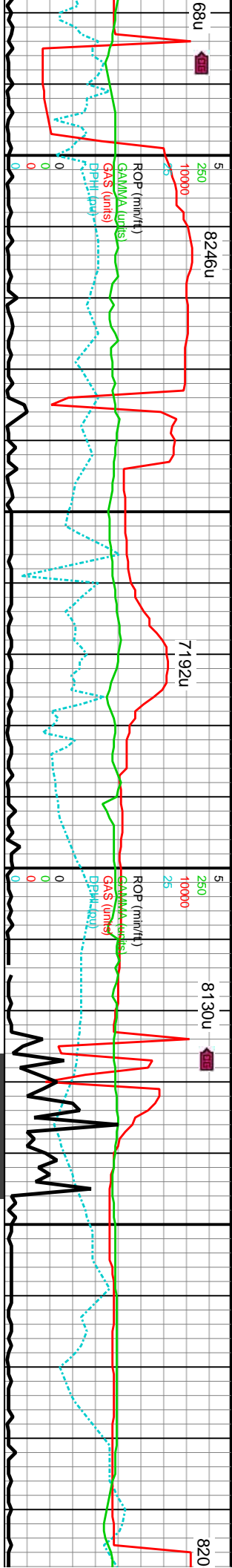
MD: 10.432'
TVD: 7.057.55'
Inclination: 90.56°
Azimuth: 275.51°
VS: 4.210.46'

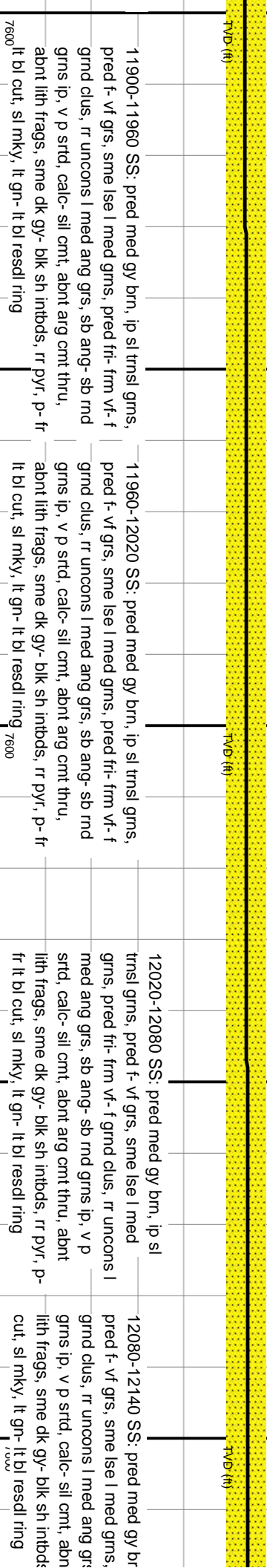
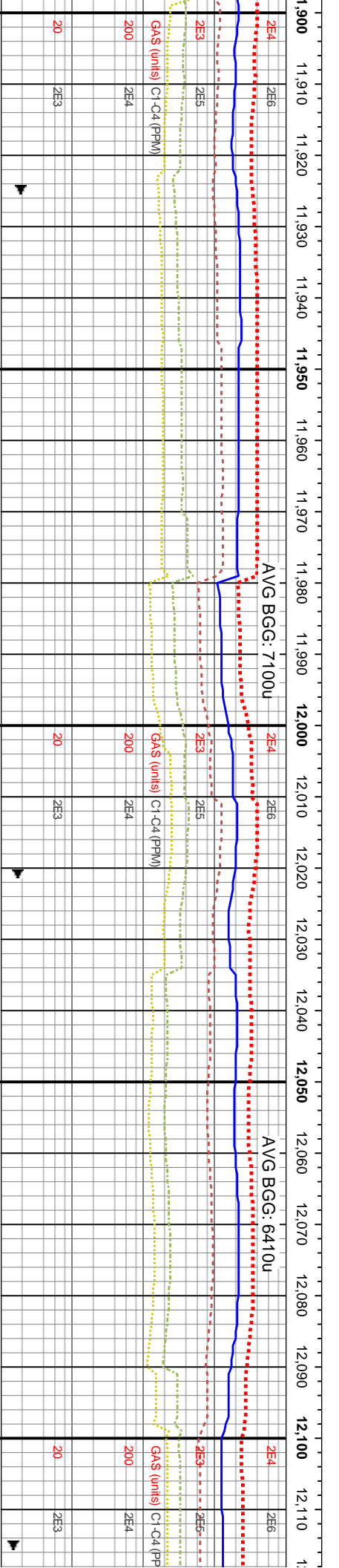
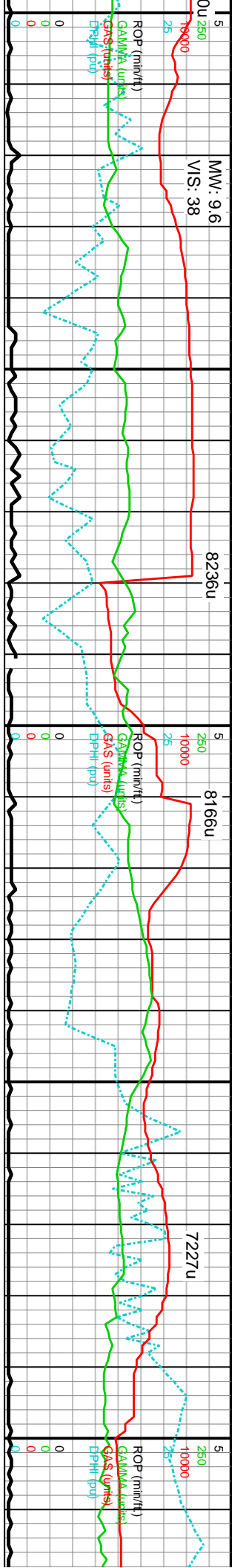
10400-10460 SS: med gy brn-dk brn, occ off wh-tnsl gy brn cls, com f off wh-tnsl off wh sd grs thru, occ c sb rd-w rd tnsl off wh-clr uncons sd grs thru, p-mod w strd vt-f-l c grs, sil fri pred gr sup cls cons w/ arg cnt & sil cnt ip, occ dk gy-blk sh inbds, rr pyr, p-fr it bl stmg cut, lt gn resdl ring	10460-10520 SS: med gy brn-dk brn, occ off wh-tnsl gy-gy brn cls, p-mod w strd vt-f-l c grs, com f off wh-tnsl off wh sd grs thru, occ c sb rd-w rd tnsl off wh-clr uncons sd grs thru, sil fri pred gr sup cls cons w/ arg cnt & sil cnt ip, occ dk gy-blk sh inbds, rr pyr, p-fr it bl stmg cut, lt gn resdl ring	10520-10580 SS: med gy brn-dk brn, occ off wh-tnsl gy-gy brn cls, p-mod w strd vt-f-l c grs, com f off wh-tnsl off wh sd grs thru, occ c sb rd-w rd tnsl off wh-clr uncons sd grs thru, sil fri pred gr sup cls cons w/ arg cnt & sil cnt ip, occ dk gy-blk sh inbds, rr pyr, p-fr it bl stmg cut, lt gn resdl ring
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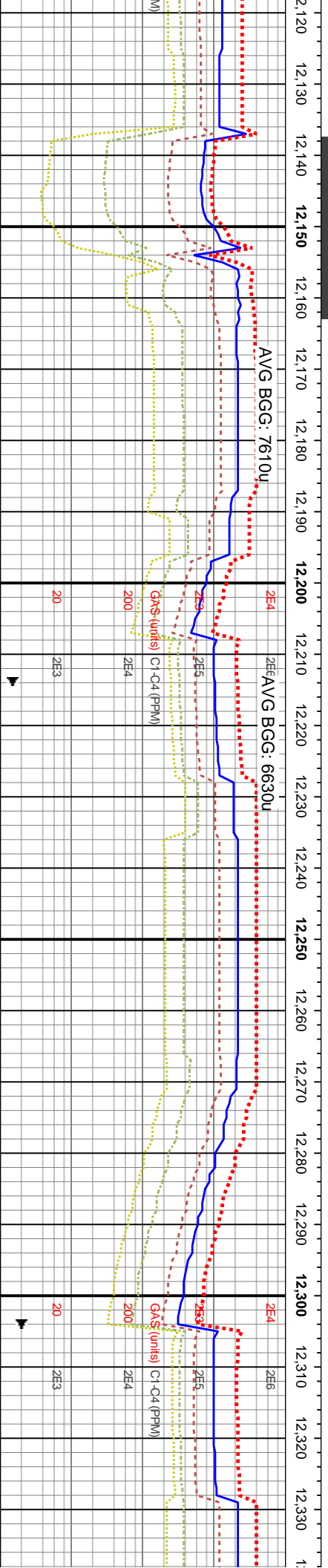












MD: 12,154'
TVD: 7,061.01'
Inclination: 90.34°
Azimuth: 272.37°
VS: -1,563.38'

WOB: 29Klbs
Rotary: 70RPM
Strokes: 104SPM
Pump Rate: 313GPM

TVD (ft)

MD: 12,250'
TVD: 7,060.37'
Inclination: 90.43°
Azimuth: 272.42°
VS: -1,559.37'

6600

TVD (ft)

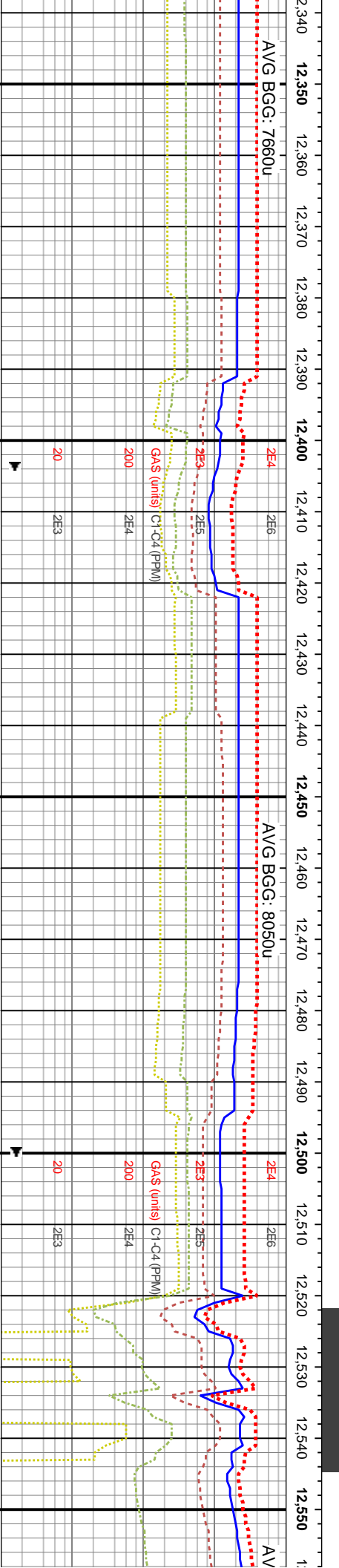
12140-12200 SS: pred med gy- gy brn, sl trnsi-amb grns, pred f- vf grs, sme lse l med grns, pred fri- frm vf- f grnd clus, tr uncons l med ang grs, sb ang- sb rnd grns ip, v p strd, calc- sil cmt, abnt arg cmt thru, abnt lith frags, rr glau, sme dk gy- blk sh intbds, rr pyr, p- fr lt bl mky, sl string, lt gn- lt bl resdl ring

12200-12260 SS: pred med gy- gy brn, sl trnsi-amb grns, pred f- vf grs, sme lse l med grns, pred fri- frm vf- f grnd clus, tr uncons l med ang grs, sb ang- sb rnd grns ip, v p strd, calc- sil cmt, abnt arg cmt thru, abnt lith frags, rr glau, sme dk gy- blk sh intbds, rr pyr, p- fr lt bl cut, sl mky, sl string, lt gn- lt bl resdl ring

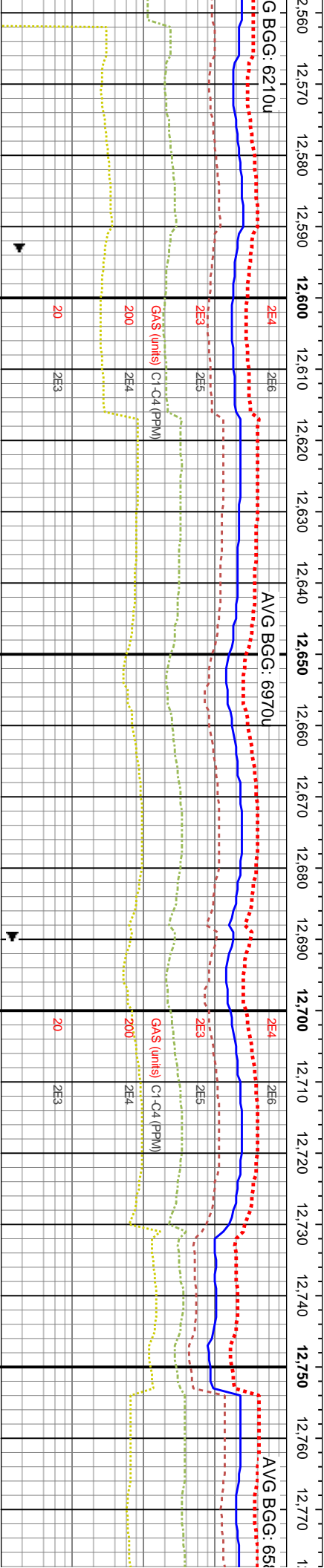
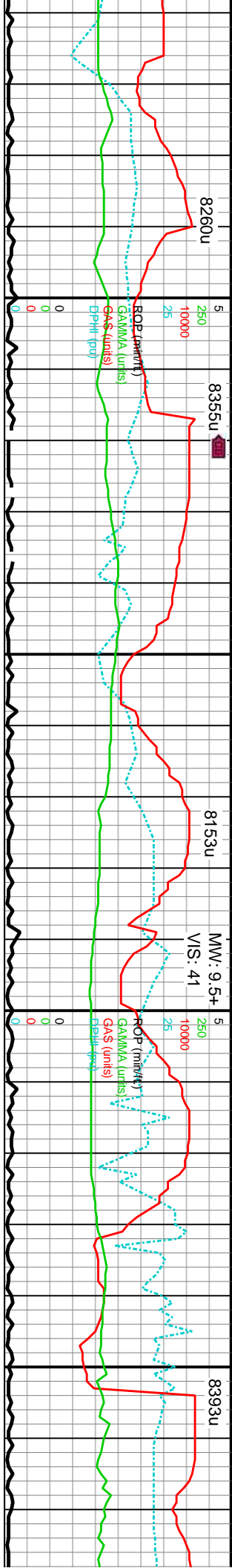
12260-12320 SS: pred med gy- gy brn, sl trnsi-amb grns, pred f- vf grs, sme lse l med grns, pred fri- frm vf- f grnd clus, tr uncons l med ang grs, sb ang- sb rnd grns ip, v p strd, calc- sil cmt, abnt arg cmt thru, abnt lith frags, rr glau, sme dk gy- blk sh intbds, rr pyr, p- fr lt bl cut, sl mky, sl string, lt gn- lt bl resdl ring

12320-12380 SS: pred med gy- gy brn, sl trnsi-amb grns, pred f- vf grs, sme lse l med grns, pred fri- frm vf- f grnd clus, tr uncons l med ang grs, sb ang- sb rnd grns ip, v p strd, calc- sil cmt, abnt arg cmt thru, abnt lith frags, rr glau, sme dk gy- blk sh intbds, rr pyr, p- fr lt bl cut, sl mky, sl string, lt gn- lt bl resdl ring





T.V.D. (ft)		T.V.D. (ft)	
13380-12440 SS: pred med gy- gy brn, sl trnsl-amb grms, pred f- vf grs, sme lse l med grms, pred fri- frm v- f grnd clus, tr unconsl l med ang grs, sb ang- sb rnd grms ip, v p strd, calc- sil cnt, abnt arg cnt thru, abnt lith frags, r glau, sme dk gy- blk sh inbds, rr pyr, rpyr, sl stmg, lt gn- lt bl resdl ring	7600	12440-12500 SS: pred med gy- gy brn, sl trnsl-amb grms, pred f- vf grs, sme lse l med grms, pred fri- frm v- f grnd ss clus, tr unconsl l med ang- rd grs, sb ang- sb rnd grms ip, v p strd, calc- sil cnt, abnt arg cnt thru, abnt lith frags, r glau, sme dk gy- blk sh inbds, rr pyr, p- fr lt bl cut, sl mky, sl stmg, lt gn- lt bl resdl ring	7600
Shale Sluffing Present		Shale Sluffing Present	
12500-12560 SS: pred med gy- gy brn, sl trnsl-amb grms, pred f- vf grs, sme lse l med grms, pred fri- frm v- f grnd ss clus, tr unconsl l med ang- rd grs, sb ang- sb rnd grms ip, v p strd, calc- sil cnt, abnt arg cnt thru, abnt lith frags, r glau, sme dk gy- blk sh inbds, rr pyr, p- fr lt bl cut, sl mky, sl stmg, lt gn- lt bl resdl ring	7600	12560-12620 SS: pred med gy- gy brn, sl trnsl-amb grms, pred f- vf grs, sme lse l med grms, pred fri- frm v- f grnd ss clus, tr unconsl l med ang- rd grs, sb ang- sb rnd grms ip, v p strd, calc- sil cnt, abnt arg cnt thru, abnt lith frags, r glau, sme dk gy- blk sh inbds, rr pyr, p- fr lt bl cut, sl mky, sl stmg, lt gn- lt bl resdl ring	7600



WOB: 32Klbs
Rotary: 70RPM
Strokes: 105SPM
Pump Rate: 315GPM

MD: 12,634'
TVD: 7,061.16'
Inclination: 88.21°
Azimuth: 271.54°
VS: -1,546.79'

MD: 12,730'
TVD: 7,064.31'
Inclination: 88.03°
Azimuth: 270.94°
VS: -1,544.71'

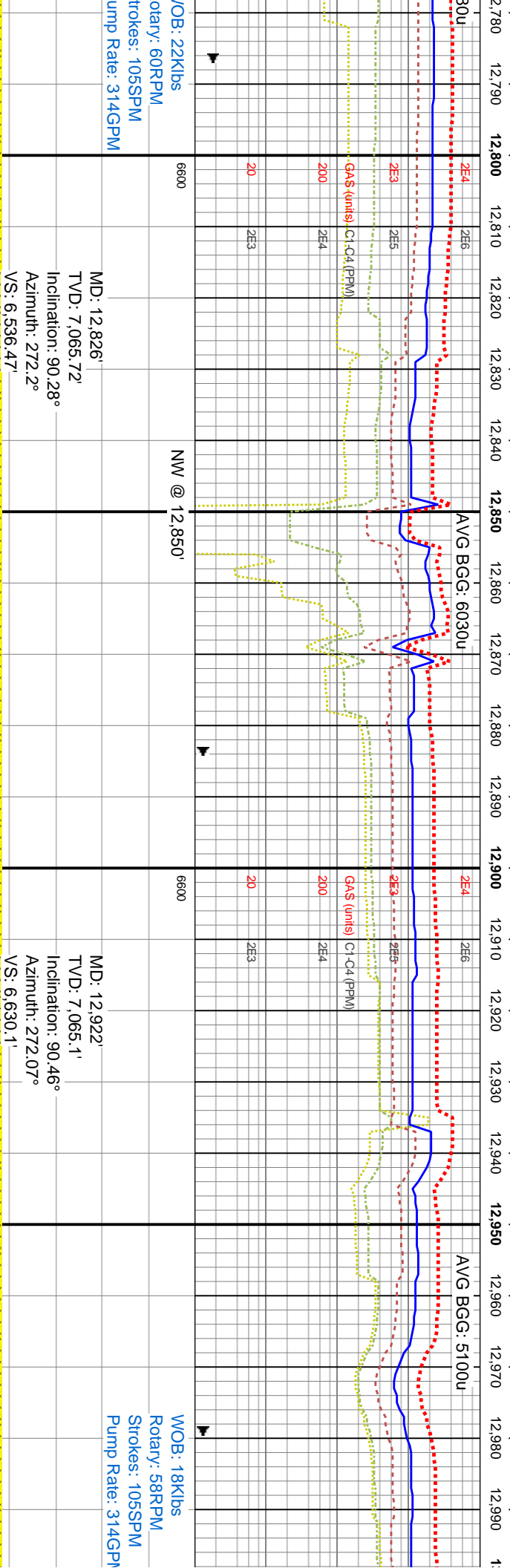
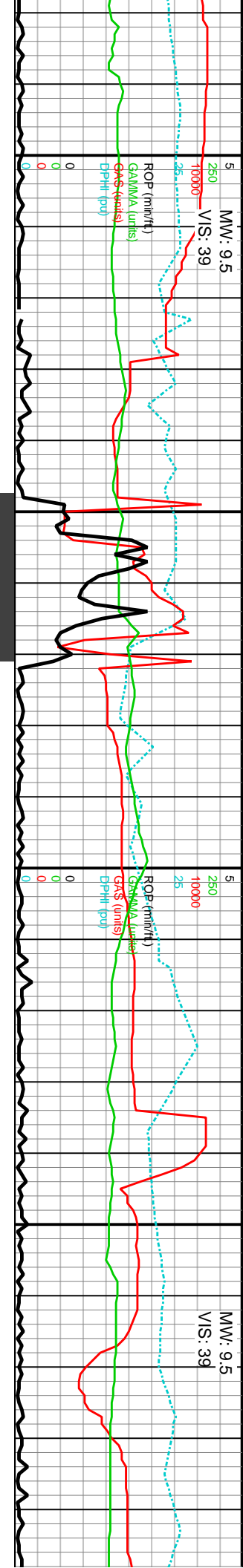
12560-12620 70% SS 30% SH: pred med gy- gy brn, sl trnsf- amb grns, pred f- vf grs, rr lse l med grns, pred frt- frm vf- f gnd ss clus, pred sb ang, sb rnd grns ip, v p srtf, calc- sil cmt, abnt arg cmt thru, abnt lith frags, rr glau, sme dk gy- blk ply sh intbds, rr pyr, p- fr lt bl cut, sl mky, lt gn- lt bl resdl ring

12620-12680 70% SS 30% SH: pred med gy- gy brn, sl trnsf- amb grns, pred f- vf grs, rr lse l med grns, pred frt- frm vf- f gnd ss clus, pred sb ang, sb rnd grns ip, v p srtf, calc- sil cmt, abnt arg cmt thru, abnt lith frags, rr glau, sme dk gy- blk ply sh intbds, rr pyr, p- fr lt bl cut, sl mky, lt gn- lt bl resdl ring

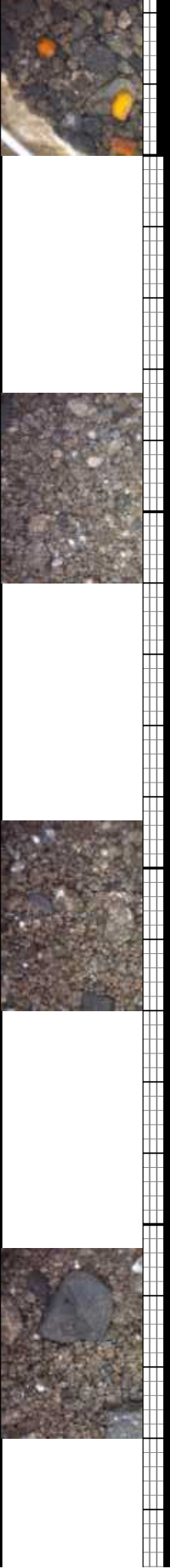
12680-12740 70% SS 30% SH: pred med gy- gy brn, sl trnsf- amb grns, pred f- vf grs, rr lse l med grns, pred frt- frm vf- f gnd ss clus, pred sb ang, sb rnd grns ip, v p srtf, calc- sil cmt, abnt arg cmt thru, abnt lith frags, rr glau, sme dk gy- blk ply sh intbds, rr pyr, p- fr lt bl cut, sl mky, lt gn- lt bl resdl ring

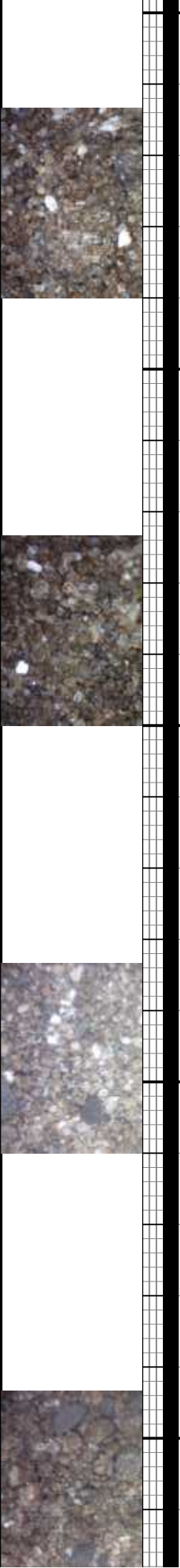
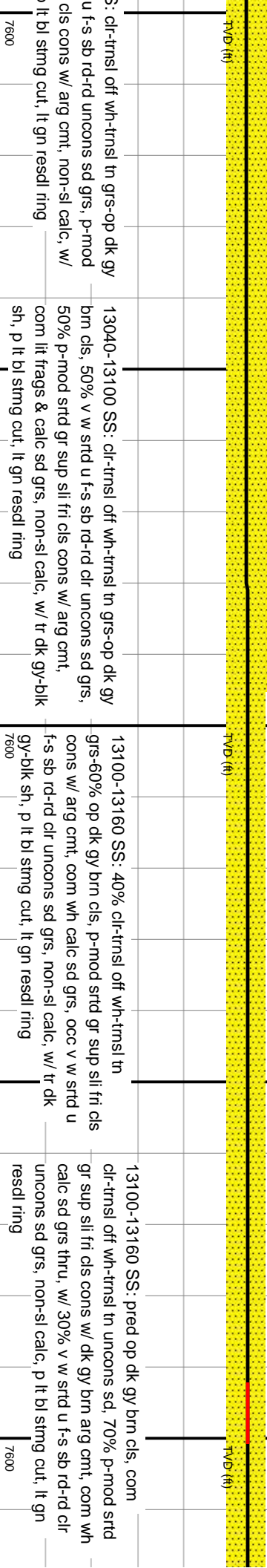
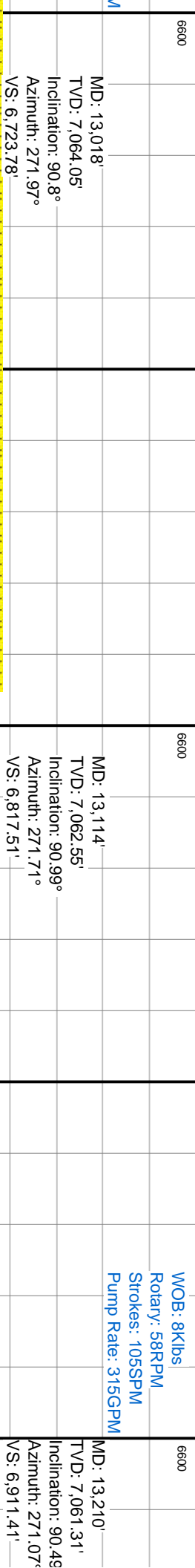
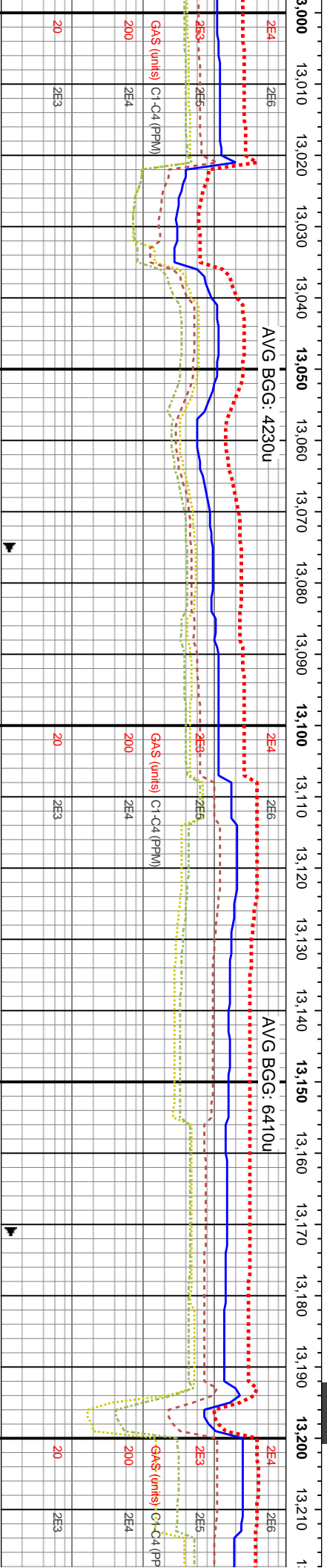
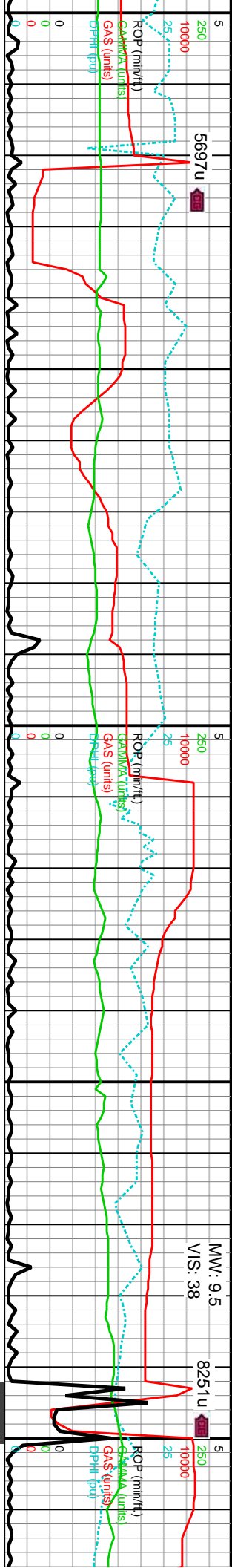
12740-12800 70% SS 30% SH: f brn, sl trnsf- amb grns, pred f- vf grs, pred frt- frm vf- f gnd ss clus, rnd grns ip, v p srtf, calc- sil cmt, abnt lith frags, rr glau, sme dk gy- blk ply sh intbds, rr pyr, p- fr lt bl cut, sl mky, lt gn-

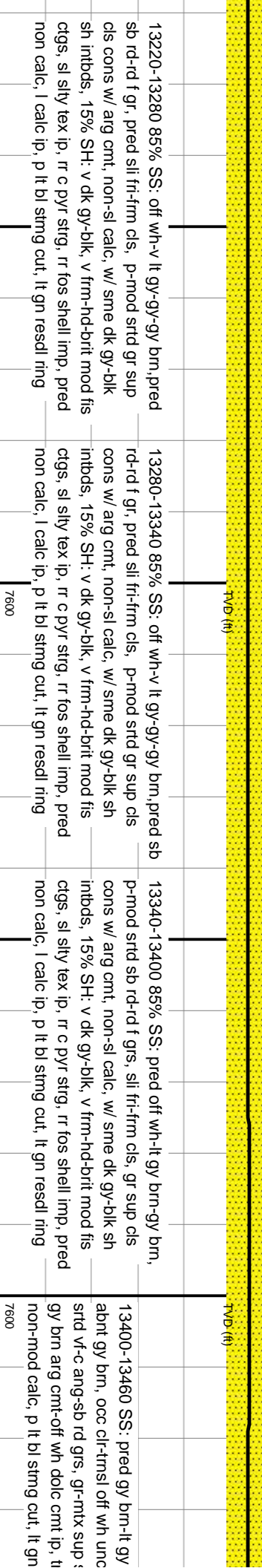
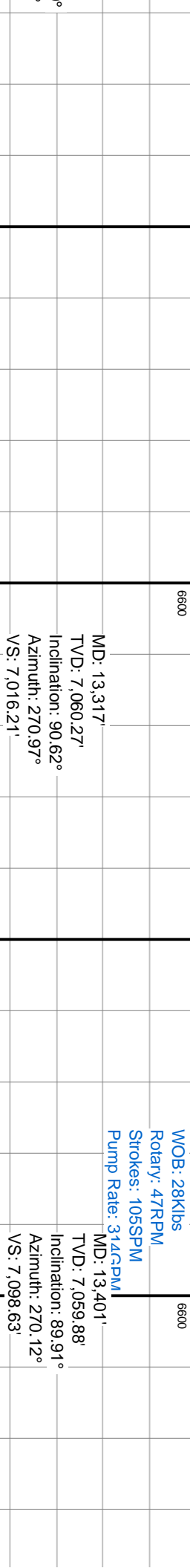
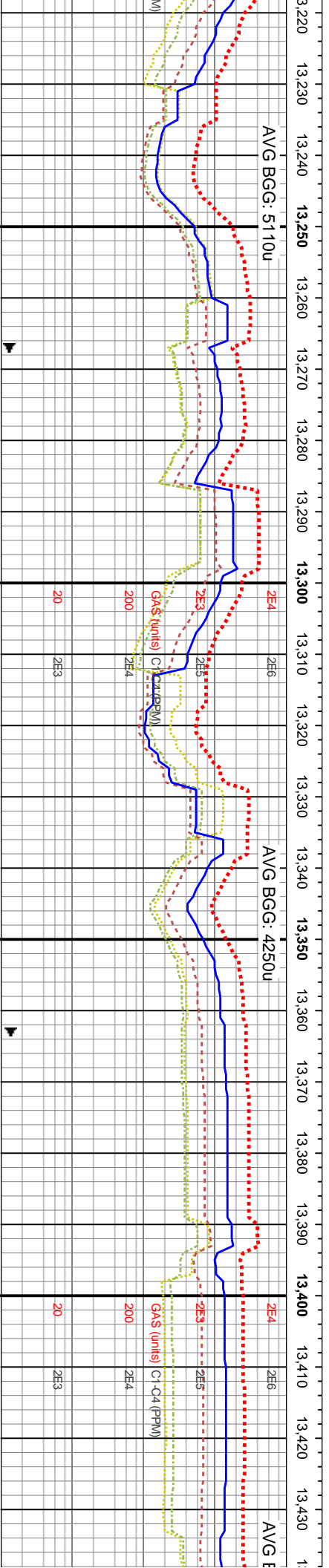
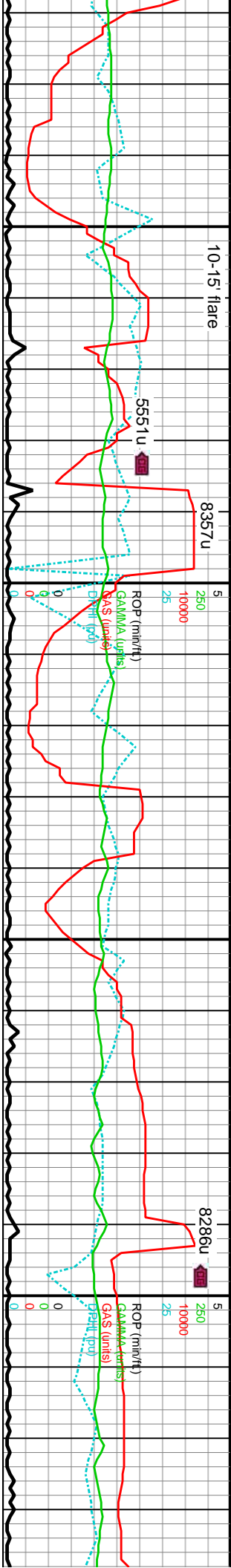


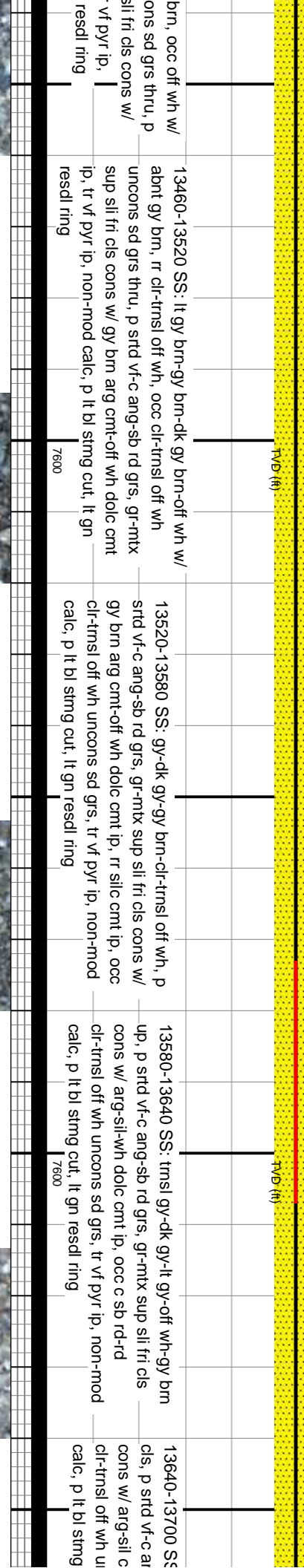
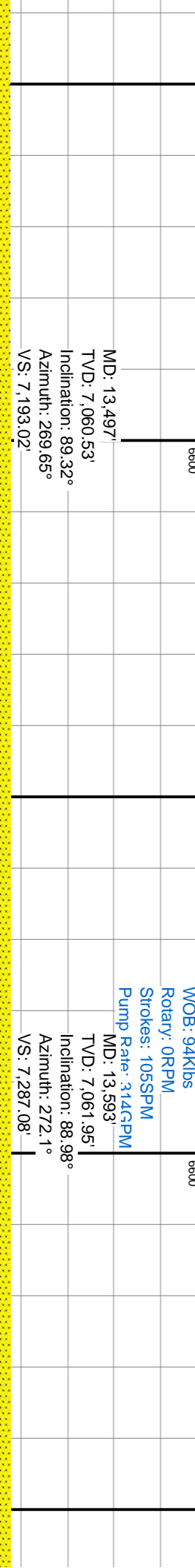
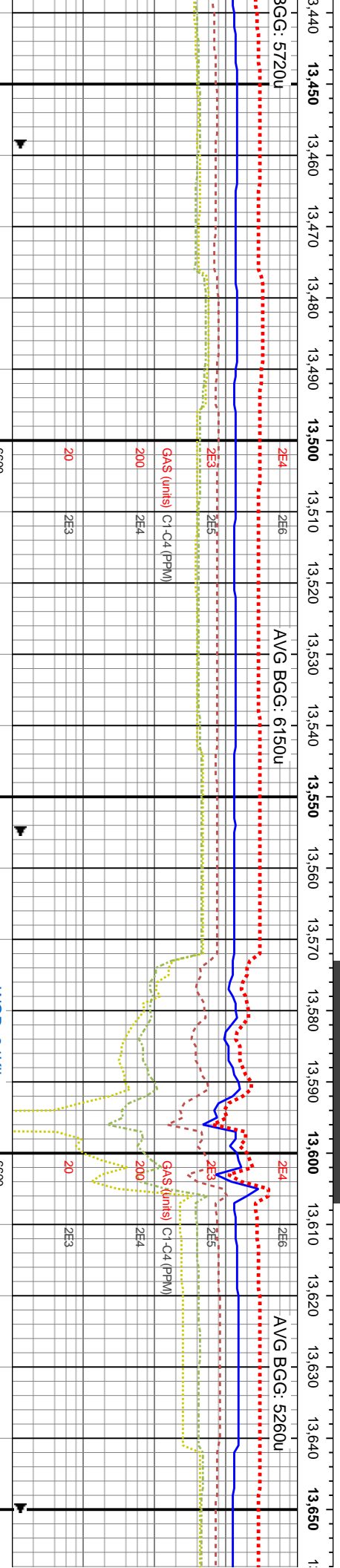
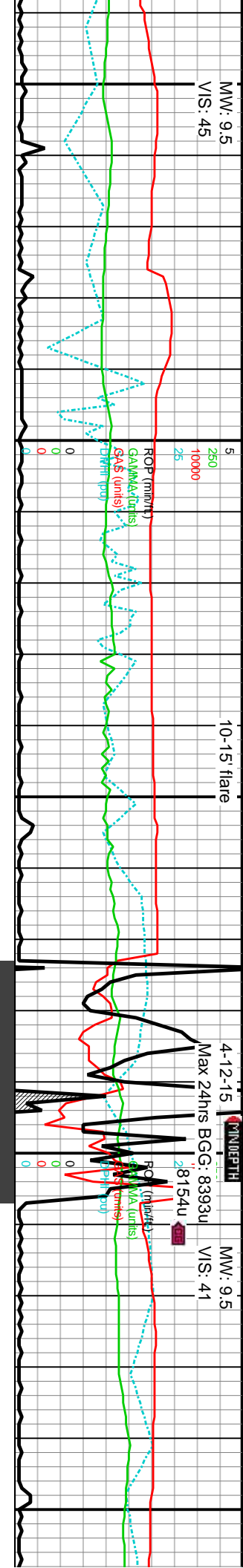


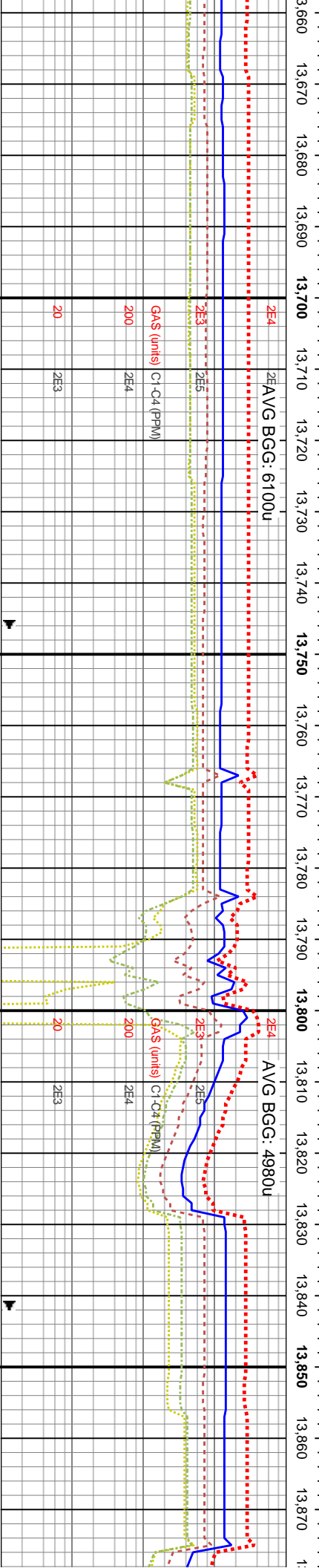
128000-12860 75% SS: dk gy brn, clr-off wh sd grs ip, vf-f gr, pred sli fri-frm cls, sb ang-sb rnd grns, p-mod strd gr sup cls cons w/ arg cmt, non-si calc, w/ sme dk gy-blk sh intbds, SH (25%): v dk gy-blk, v frm-hd-brit mod fts ctgs, sl stly tex ip, tr pyr strg, pred non calc, l calc ip, p-fr lt bl stmg cut, sl mky, lt gn resdl ring	12860-12920 80% SS: dk gy brn, clr-off wh sd grs ip, vf-f gr, pred sli fri-frm cls, sb ang-sb rnd grns, p-mod strd gr sup cls cons w/ arg cmt, non-si calc, w/ sme dk gy-blk sh intbds, 20% SH: v dk gy-blk, v frm-hd-brit mod fts ctgs, sl stly tex ip, tr pyr strg, pred non calc, l calc ip, p-fr lt bl stmg cut, sl mky, lt gn resdl ring	12920-12980 80% SS: dk gy brn, clr-off wh sd grs ip, vf-f gr, pred sli fri-frm cls, sb ang-sb rnd grns, p-mod strd gr sup cls cons w/ arg cmt, non-si calc, w/ sme dk gy-blk sh intbds, 20% SH: v dk gy-blk, v frm-hd-brit mod fts ctgs, sl stly tex ip, tr c pyr strg, tr tos shell imp, pred non calc, l calc ip, p-fr lt bl stmg cut, sl mky, lt gn resdl ring
128000	12860	12920

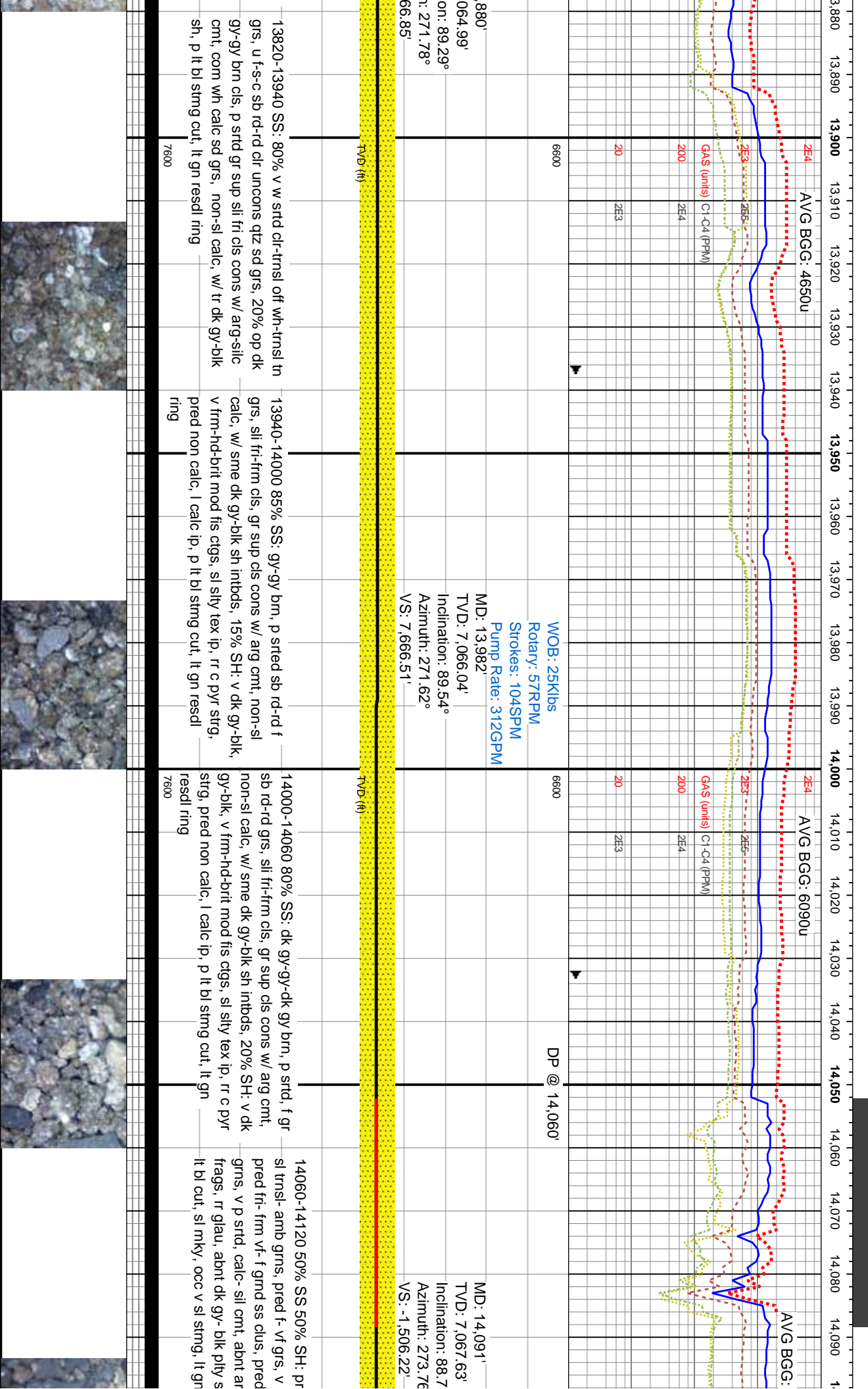


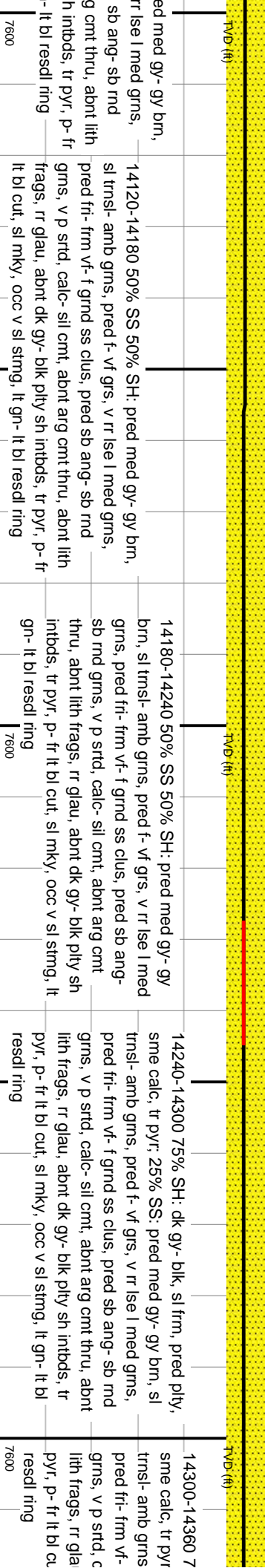
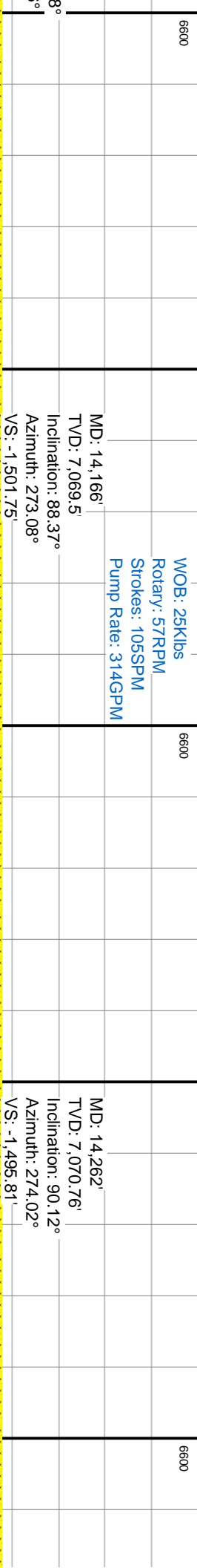
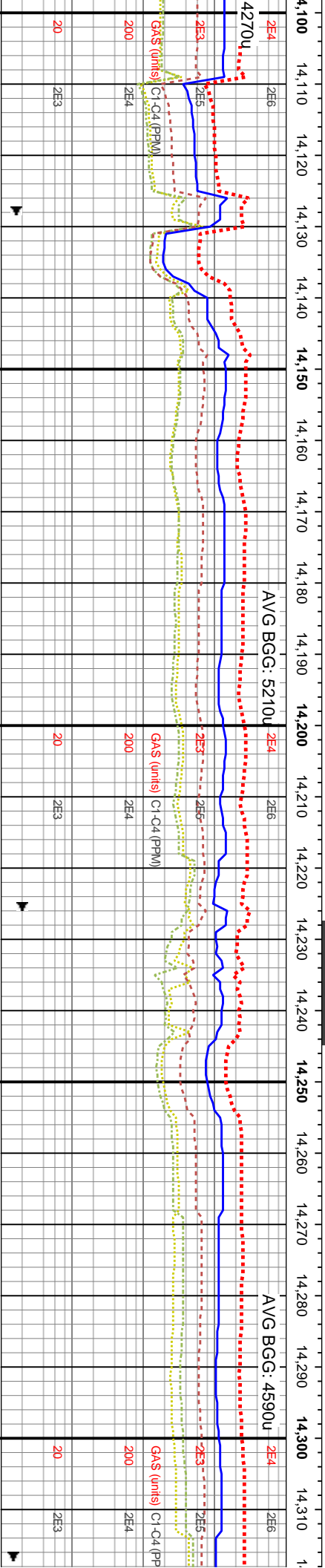
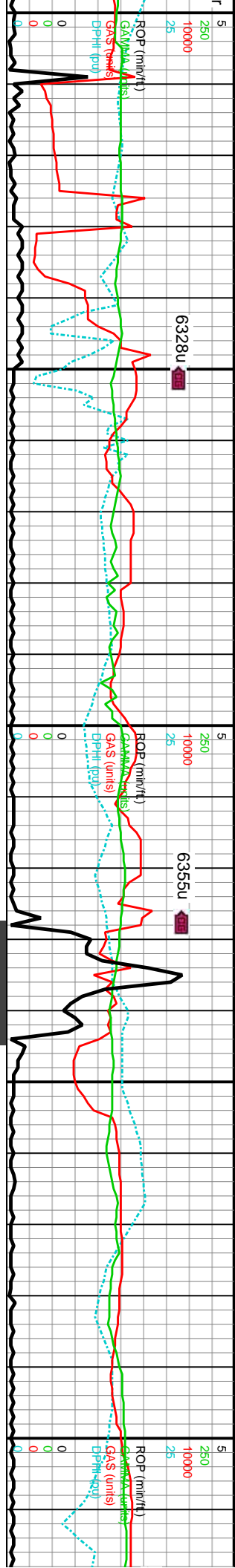


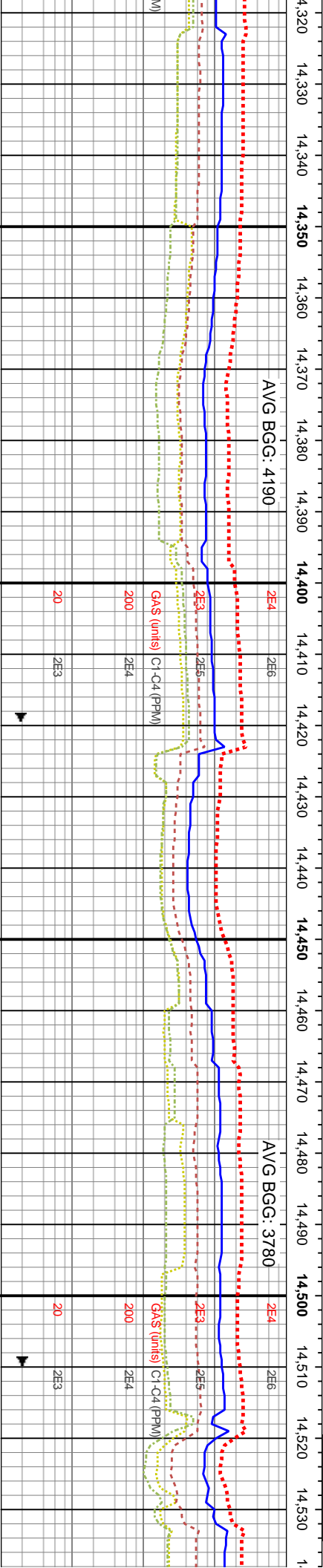
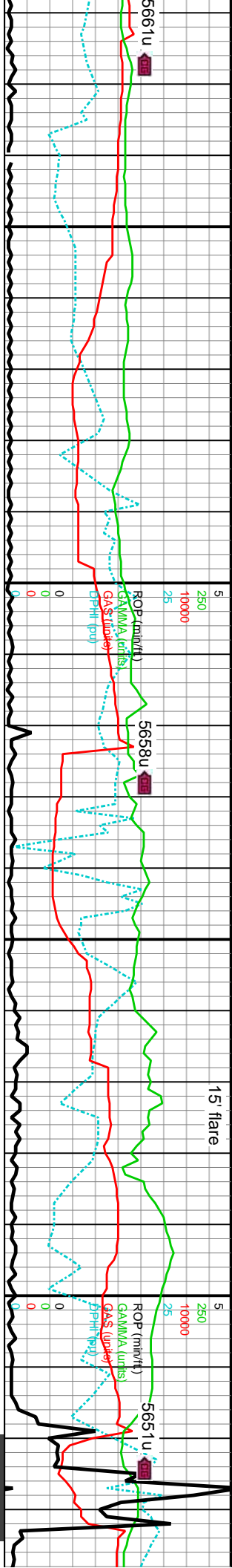












MD: 14,357'
TVD: 7,070.76'
Inclination: 89.88°
Azimuth: 273.38°
VS: -1,489.67'

WOB: 25Klbs
Rotary: 64RPM
Strokes: 105SPM
Pump Rate: 314GPM

TVD (ft)

MD: 14,452'
TVD: 7,071.27'
Inclination: 89.51°
Azimuth: 273.05°
VS: -1,484.35'

NW @ 14,480'

TVD (ft)

55% SH: dk gy- blk, sl frm, pred ply,
; 25% SS: pred med gy- gy brn, sl
pred f- vf grs, v rr lse l med grns,
f grnd ss clus, pred sb ang- sb rnd
calc- sil cnt, abnt arg cnt thru, abnt
u, abnt dk gy- blk ply sh inbnds, tr
it, sl mky, occ v sl stmg, lt gn- lt bl

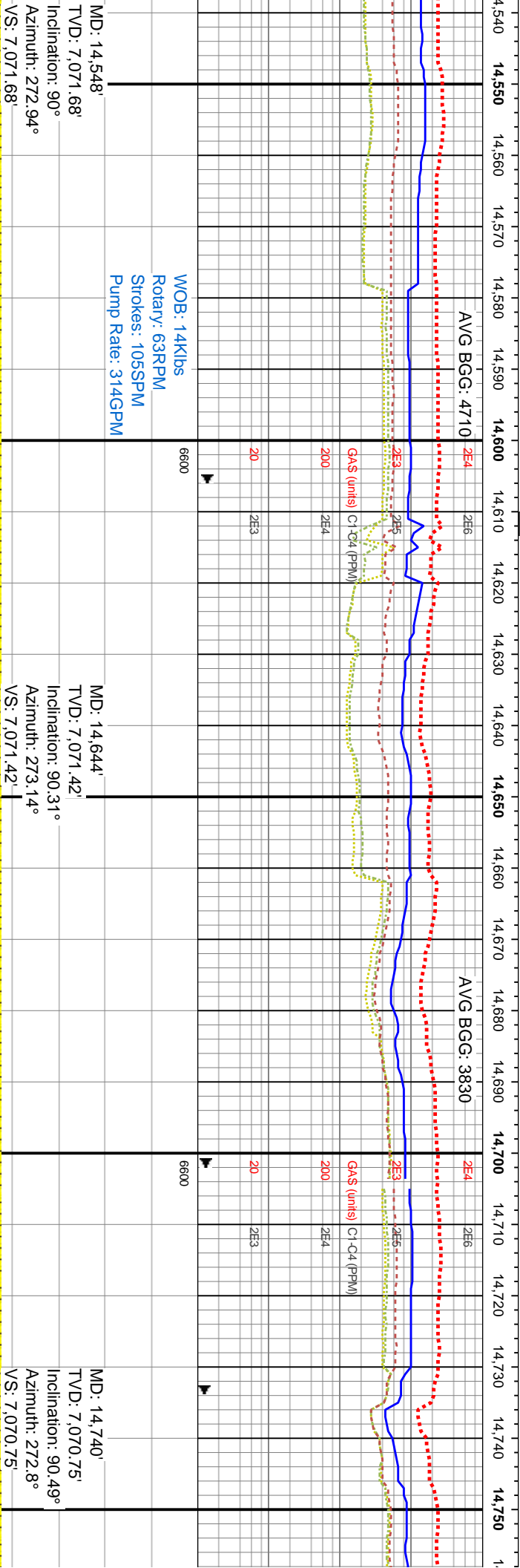
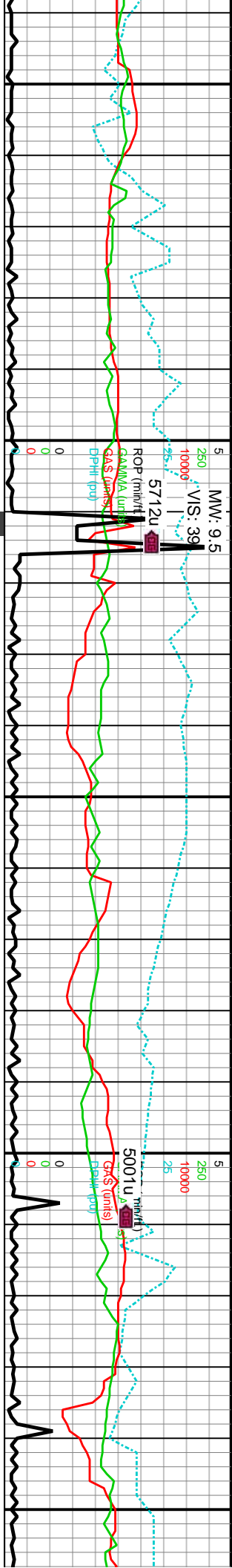
14360-14420 75% SH: dk gy- blk, sl frm, pred ply,
sme calc, tr pyr, 25% SS: pred med gy- gy brn, sl trnsl-
amb grns, pred f- vf grs, v rr lse l med grns, pred fri-
frm vf- f grnd ss clus, pred sb ang- sb rnd grns, v p
strd, calc- sil cnt, abnt arg cnt thru, abnt lith frags, rr
glau, abnt dk gy- blk ply sh inbnds, tr pyr, p- fr lt bl cut,
sl mky, occ v sl stmg, lt gn- lt bl resd ring

7600

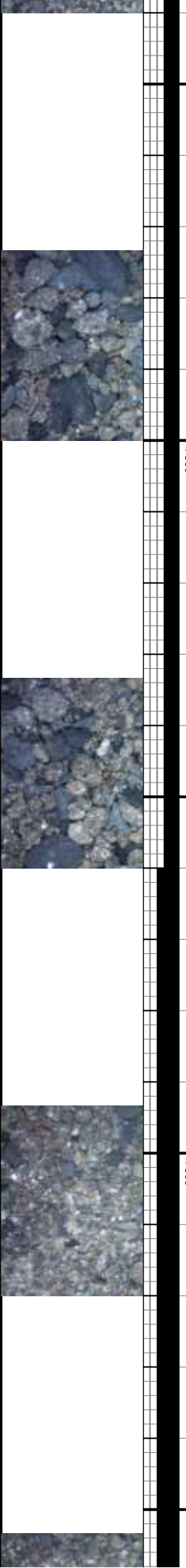
14420-14480 60% SH: dk gy-blk, frm-v frm, brit,
med-hi fis sb ply-ply-sply cigs, sm-sily tex, tr sd,
thn lamn, sl calc, 40% SS: pred gy-lt gy-dk gy-gy brn,
occ off wh, p-mod strd pred gr sup cls cons w/ sil &
arg cnt, com wh calc sd grs, rr-occ vf pyr, pred non
calc, tr sl calc, p stmg cut, lt gn resd ring

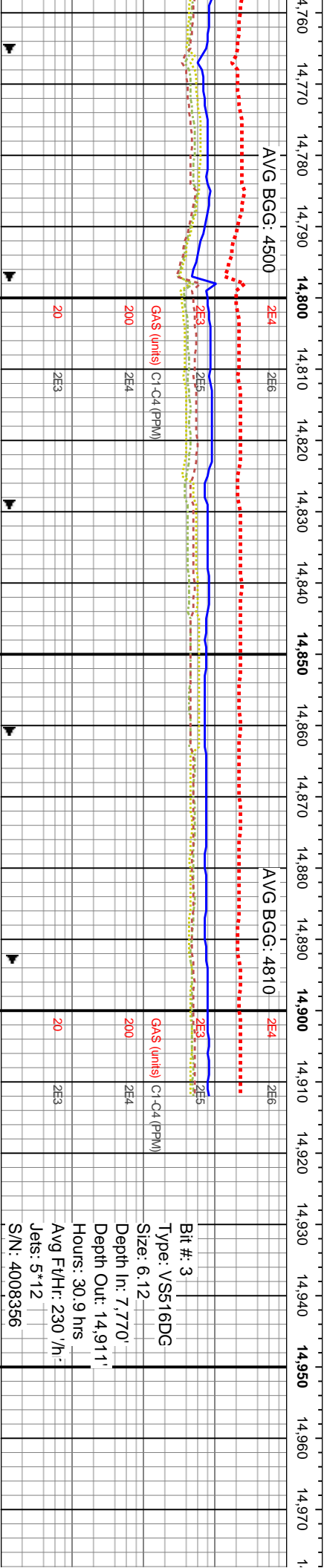
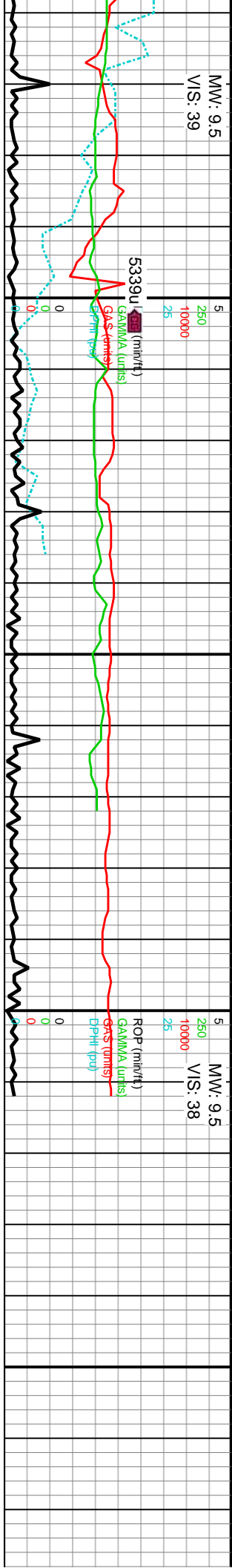
7600

14480-14540 50% SS: pred gy-dk gy-gy brn, occ off
wh, p-mod strd pred gr sup cls cons w/ sil & arg cnt,
com wh calc sd grs, rr-occ vf pyr, pred non calc, tr sl
calc, w/ hi fis sh inbnds, SH (50%): dk gy-blk, frm-v
frm-brit, med-hi fis sb ply-ply-sply cigs, sm-sily tex,
thn lamn, tr sd, sl calc, p stmg cut, lt gn resd ring



MD: 14,548' TVD: 7,071.68' Inclination: 90° Azimuth: 272.94° VS: 7,071.68'	WOB: 14Klbs Rotary: 63RPM Strokes: 105SPM Pump Rate: 314GPM	6600	MD: 14,644' TVD: 7,071.42' Inclination: 90.31° Azimuth: 273.14° VS: 7,071.42'	6600	MD: 14,740' TVD: 7,070.75' Inclination: 90.49° Azimuth: 272.8° VS: 7,070.75'
14540-14600 50% SS: pred trnsi gy brn-brn, occ off wh-tr lt gy, p-mod strd pred gr sup cls cons w/ sil & arg cnt, com wh calc sd grs & lith frags, rr-occ vf pyr, pred non calc, tr sl calc, w/ intbdd SH (50%): dk gy-blk, occ lt gy, frm-v frm-brit, med-hi fis sb ply-blky-pty cigs, sm-sily tex, thn lamm, tr sd, sl calc, p stmg cut, lt gn resdl ring	14600-14660 50% SS: pred trnsi gy brn-brn, occ off wh-tr lt gy, p-mod strd pred gr sup cls cons w/ sil & arg cnt, com wh calc sd grs & lith frags, rr-occ vf pyr, pred non calc, tr sl calc, w/ intbdd SH (50%): dk gy-blk, occ lt gy, frm-v frm-brit, med-hi fis sb ply-blky-pty cigs, sm-sily tex, thn lamm, tr sd, sl calc, p stmg cut, lt gn resdl ring	7600	14660-14720 70% SS: gy-gy brn, com clr-trnsi off wh-it gy uncons sd, p-mod strd, gr sup cls cons w/ sil & arg cnt-w strd f-u f sb rd-rd uncons sd, rr-occ vf pyr, com wh calc sd grs & lith frags, pred non calc, tr sl calc, w/ intbdd SH (30%): dk gy-blk, occ lt gy, frm-v frm-brit, med-hi fis sb ply-blky-pty cigs, sm-sily tex, thn lamm, tr sd, sl calc, p-fr stmg cut, fr lt gn resdl ring	7600	14720-14780 75% SS: gy-gy brn, c wh-it gy uncons sd, p-mod strd, gr & arg cnt-w strd f-u f sb rd-rd unco com wh calc sd grs & lith frags, pred calc, SH (25%): dk gy-blk, occ lt gy med-hi fis sb ply-blky-pty cigs, sm tr sd, sl calc, p-fr stmg cut, fr lt gn r





om cl-trnsl off sup dis cons w/ sil ns sd, r-occ vf pyr, d non calc, tr sl gy, frm-v frm-brit, sily tex, thn lamm, ssdl ring	14780-14840 70% SS: gy-gy bn cons dis-cl-trnsl off wh-lt gy uncons sd, p-mod strd, gr sup dis cons w/ sil & arg cnt-w strd f-u f sb rd-rd uncons sd, r-occ vf pyr, com wh calc sd grs & lith frags, pred non calc, tr sl calc, SH (30%): dk gy-blk, occ lt gy-gy, frm-v frm-brit, med-hi fis sb pily-blky-pily ctgs, sm-sily tex, thn lamm, tr sd, sl calc, p-fr stmg cut, fr lt gn resdl ring	14840-14911 70% SS: pred gy-gy bn cons cls, occ cl-trnsl off wh-lt gy, p-mod strd, gr sup cls cons w/ sil & arg cnt, com wh calc sd grs & lith frags & tr pyr, occ w strd f-u f sb rd-rd uncons sd ip, pred non calc, tr sl calc, SH (30%): dk gy-blk, occ lt gy-gy, frm-v frm-brit, med-hi fis sb pily-blky-pily ctgs, sm-sily tex, thn lamm, tr sd, sl calc, p-fr stmg cut, fr lt gn resdl ring
7600	7600	7600

MD: 14,853'
TVD: 7,071.24'
Inclination: 89.01°
Azimuth: 271.25°
VS: 7,071.24'

MD: 14,912'
TVD: 7,072.26'
Inclination: 89.01°
Azimuth: 271.25°

TD well @
22:10 MST
on 4/12/15

