



Empirica

Scale: 5" / 100'

Measured Depth Log

Well Name Troudt1_HZ

Location S 32 T2N R67W

State Colorado

Country USA

County Weld

Rig Number Savanna 802

API Number 05-123-41433-0000

Field Wattenberg

Region DJ Basin

Drilling Completed 9/15/2015

Spud Date 9/11/2015

Surface Coordinates Lat: 40° 5' 20.634"N

Long: 104° 54' 31.374"W

Ground Elevation 5,079'

K.B. Elevation 5,094'

Logged Interval 5,000' **To** 17,859'

Total Depth 17,859'

Formation Niobrara B Chalk

Type of Drilling Fluid Invert

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 197










Comments Start: 9-11-15
TD: 9-15-15

Services Provided 2-man Logging

























Logger Names Stuart Henry Printz/ Nicholas

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












































Zone Color Coding

	Oil		Condensate		Gas
	Note		Core		Pressure
	Error		Water		Seal




Rock Types

	UNKNOWN		DOLOMITE		SHALE GRAY		TILL
	ANHYDRITE		CHERT		SHALE COLORED		BENTONITE
	GYP SUM		COAL		SILTSTONE		TUFF
	SALT		MARLSTONE		SANDSTONE		IGNEOUS
	CHALK		CLAYSTONE		CONGLOMERATE		METAMORPHIC
	LIMESTONE		SHALE		BRECCIA		CEMENT





Accessories

	F FOSSIL		ARGILLACEOUS		GLAUCONITE
	GASTROPOD		ARGILLITE GRAIN		GYP SIFEROUS
	OOLITE		B BENTONITE		HEAVY MINERAL
	OSTRACOD		BITUMENOUS SUBSTANCE		KAOLIN
	PELECYPOD		BRECCIA FRAGMENTS		MARLSTONE
	PELLET		CALCAREOUS		MINERAL CRYSTALS
	PISOLUTE		CARBONACEOUS FLAKES		NODULES
	PLANT REMAINS		CHERT		PHOSPHATE PELLETS
	SCAPHOPOD		CHERT		PYRITE
	STROMATOPOROID		COAL - THIN BEDS		SALT CAST
	ECHINOID		DOLOMITIC		SANDY
	FISH		FELDSPAR		SILICEOUS
	FORAMINIFERA		FERRUGINOUS PELLET		SILTY
	ANHYDRITIC		FERRUGINOUS		TUFFACEOUS
					SILTSTONE STRINGER


Stringer

	ANHYDRITE STRINGER
	BENTONITE STRINGER
	COAL STRINGER
	DOLOMITE STRINGER
	GYP SUM STRINGER
	LIMESTONE STRINGER
	MARLSTONE (CALC) STRG
	MARLSTONE (DOL) STRG
	SANDSTONE STRINGER
	SHALE STRINGER
	SILTSTONE STRINGER

Other Symbols

	ORGANIC		FORMATION
	PINPOINT		GAS SHOW

	DEAD		VUGGY		MIN DEPTH
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	EVEN		NORMAL FAULT
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Engineering

	QUESTIONABLE		OIL SHOW
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	SPOTTED STAINING		BIT		OVERTURNED STR
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Porosity

	CASING		REVERSE FAULT
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	CONNECTION (LEFT)		SIDEWALL CORE
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	CONNECTION (RIGHT)		SIDEWALL CORE
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	FENESTRAL		CONNECTION GAS		SLIDE
---	-----------	---	----------------	---	-------

	FRACTURE		CORE - LOST		SURVEY
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	INTERCRYSTALLINE		CORE - RECOVERED		TRIP GAS
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	INTERCOLLITIC		DST INTERVAL		WIRELINE TESTER
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	MOLDIC		FAULT		WIRELINE TESTER
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ols


TOP

L LITHOGRAPHIC

Rounding

 MICROXLN

 ANGULAR  MUDSTONE

 ROUNDED  PACKSTONE

 SUBANG  WACKESTONE

RATA

 SUBBRND

Sorting

Textures

 MODERATE

(LEFT)

(RIGHT)  BOUNDSTONE  POOR

 CHALKY  WELL


 CRYPTOXLN

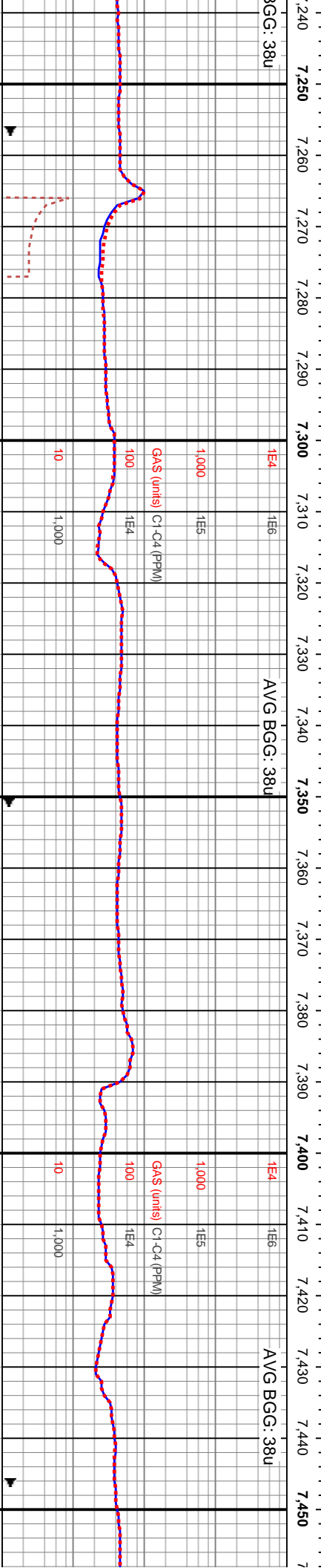
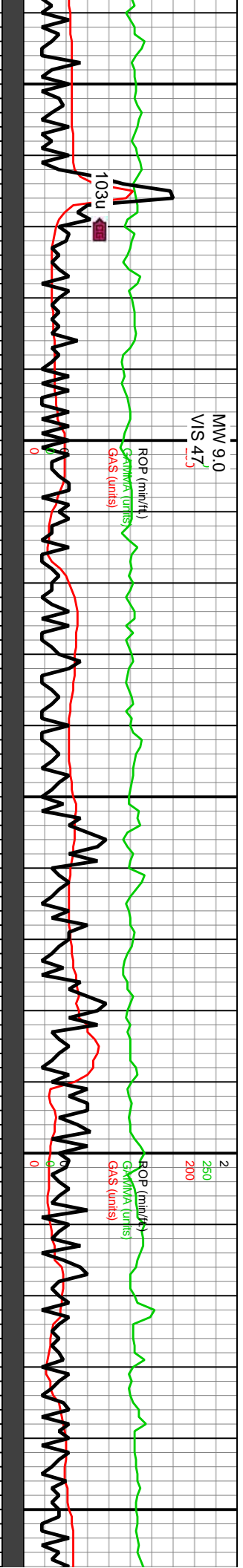
 EARTHY

D - LEFT

 FINELYXLN

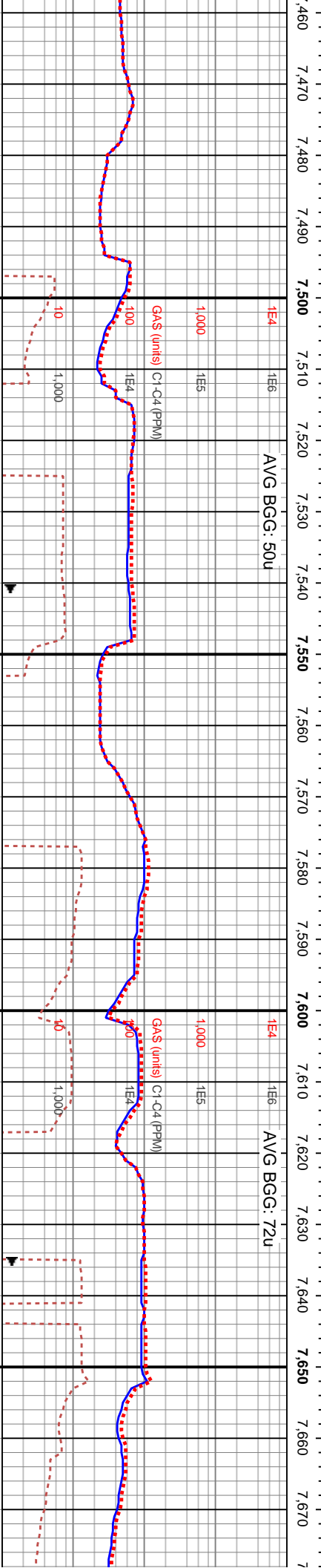
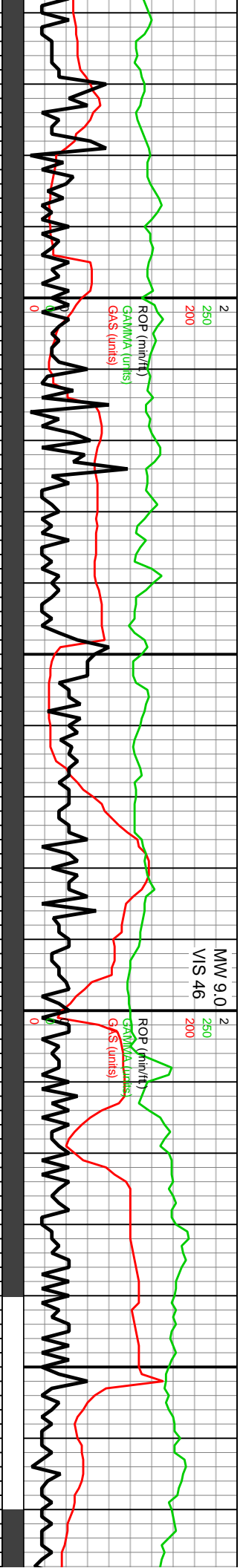
D - RT

 GRAINSTONE



NW @ 7,280'		6900	WOB: 3Klbs Rotary: 0RPM Strokes: 190SPM Pump Rate: 582GPM		6900
MD: 7,292' TVD: 7,146.68' Inclination: 35.65° Azimuth: 9.52° VS: -411.75'		TVD (ft)	MD: 7,387' TVD: 7,219.91' Inclination: 43.4° Azimuth: 5.6° VS: -351.38'		TVD (ft)
2280 SH (70%): dk-med gy, pty-sb ly ip, occly rgh tex, non-v sl calc, tr mic sec; SLTST (30%): med-dk gy, frm-hrd, pty, occly blkly, sl rgh tex, sl micnica, ic		7900	7280-7400 SLTST (70%): lt gy-gy, occ dk gy, frm, brit, arg sb rd-sb blkly-sb pty l fis ctgs, v stly wi dk gy arg cmt, non calc, grdg wi decr sit to SH (20%): pred gy-dk gy, mod frm-frm, l fis ctgs, stly ip, pred non calc, 10% SS: lt gy-gy, p strd, pred mtz sup cls cons wi arg cmt, dolc ip, pred non calc, tr sl-mod calc		7900

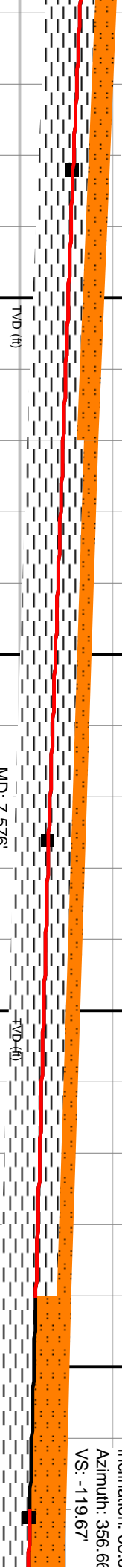




MD: 7,482'
TVD: 7,283.62'
Inclination: 52.33°
Azimuth: 359.31°
VS: -281.21'

WOB: 8Klbs
Rotary: 0RPM
Strokes: 190SPM
Pump Rate: 582GPM

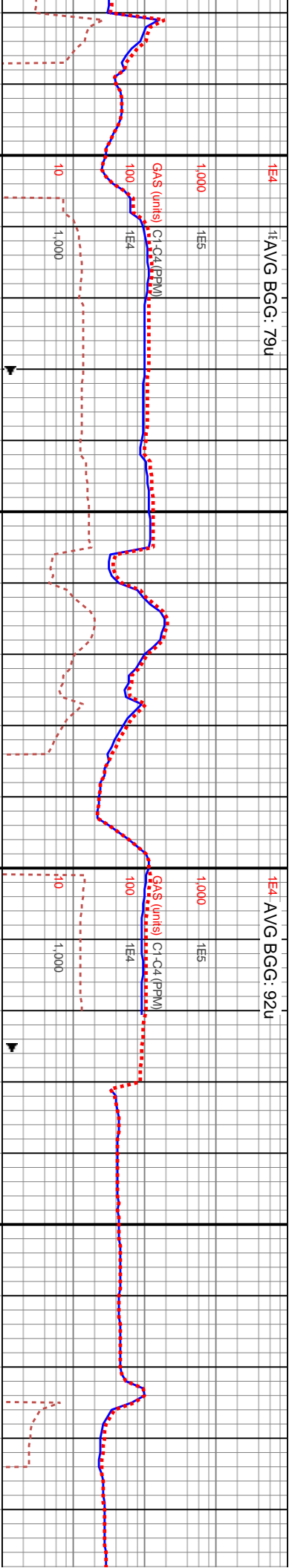
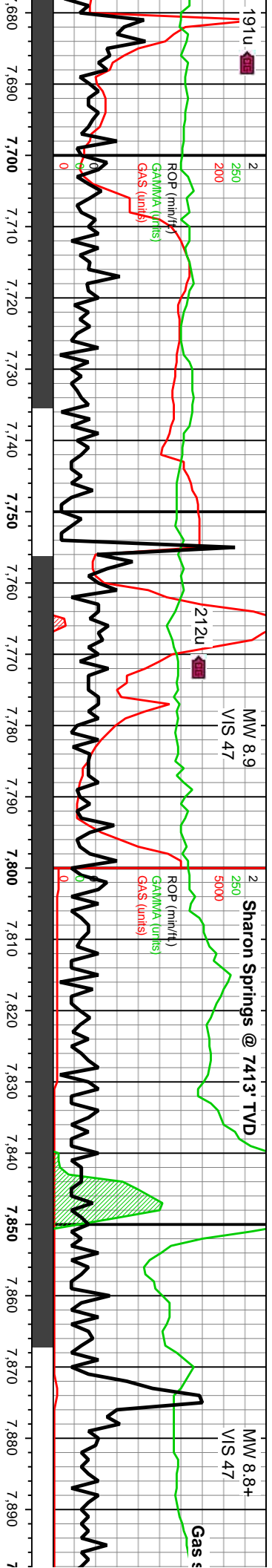
MD: 7,671'
TVD: 7,377.17'
Inclination: 68.8°
Azimuth: 356.6°
VS: -119.67'



7460-7520 SH (70%): pred lt gy-gy, pred sft-med frm, mod w hydrated, l-mod fis sb rd-scalloped ctgs, silty ip, pred non calc, incr silt to SLTST (~30%); lt gy-gy, occ dk gy, frm, brit, arg sb rd-sb blk-y-sb ply l fis ctgs, v silty wi dk gy arg cnt, non calc, wi tr mod calc sd cis

7520-7640 SH (80%): lt gy-gy, occ dk gy, sft-med frm, occ frm, mod w hydrated, l-mod fis sb rd-tab-flaggy ctgs, silty ip, pred non calc, incr silt to SLTST (20%); lt gy-gy, occ dk gy, frm, brit, arg sb rd-sb blk-y-sb ply l fis ctgs, v silty wi dk gy arg cnt, non calc, wi tr mod calc sd cis

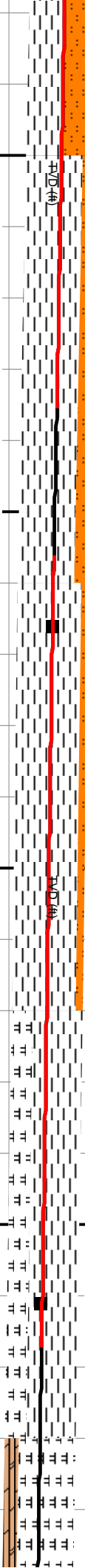
7640-7700 SH (50%): lt gy-gy-lt gy sft-med frm, occ frm, l-mod fis sb rd-sb blk-y-sb blk, pred non calc, incr silt to SLTST occ dk gy, frm, brit, arg sb rd-sb blk v silty wi dk gy arg cnt, non calc, wi



WOB: 35Klbs
Rotary: 25RPM
Strokes: 190SPM
Pump Rate: 581GPM

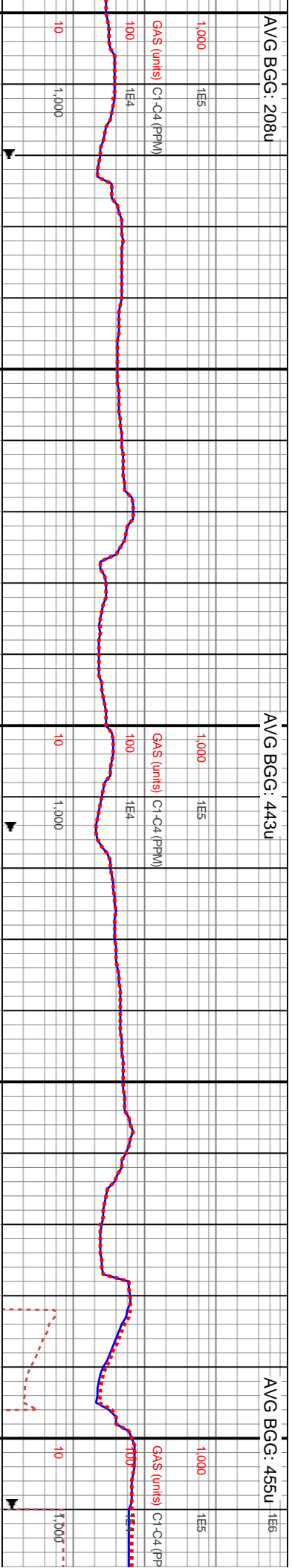
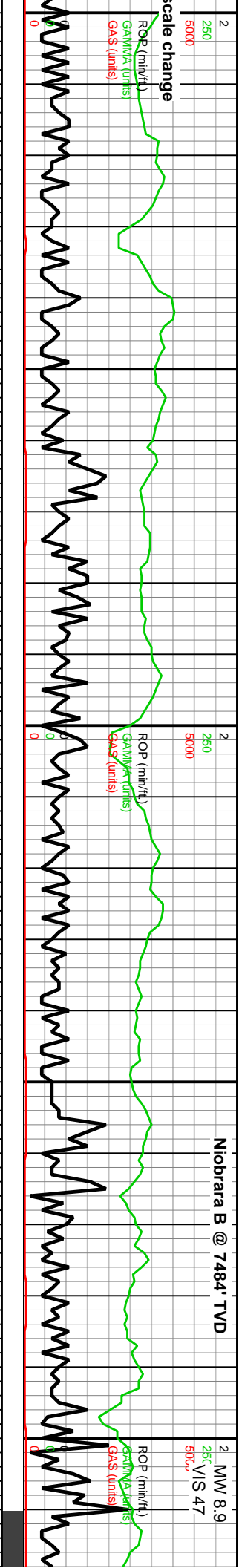
MD: 7,766'
TVD: 7,405.43'
Inclination: 76.49°
Azimuth: 355.88°
VS: -30.3'

MD: 7,861'	
TVD: 7,427.74'	
Inclination: 76.35°	
Azimuth: 0.3°	
VS: 61.18'	



Sample	Preparation	Analysis	Results
7700-7760 SH (80%)	pred gy-dk gy, occ lt gy, rr brn ox, med frm-firm, l-mod fis sb rd-scal ctgs, pred sm-sl silty tex, pred non calc, incr silt to SL TST (20%)	lt gy-gy, occ dk gy, frm, brit, arg sb rd-sb blk-y-sb ply l fis ctgs, non calc	
7760-7820 SH (90%)	pred gy-dk gy, occ lt gy, rr brn ox, med frm-firm, l-mod fis sb rd-scal ctgs, pred sm-sl silty tex, pred non calc, incr silt to SL TST (10%)	lt gy-gy, occ dk gy, frm, brit, arg sb rd-sb blk-y-sb ply l fis ctgs, non calc	
7820-7880 SH (70%)	pred gy-dk gy, occ lt gy, rr brn ox, med frm-firm, l-mod fis sb rd-scal ctgs, pred sm-sl silty tex, non-mod calc, wi 30% MRLST	pred dk gy, occ gy, l fis sb rd med frm-firm ctgs, occ brn incl, brn mod calc, wi tr CHK	
7880-7940 MRL	rd med frm-firm c 20% CHK	lt gy-ply-sb blk-y ctgs	





MD: 7,956'
TVD: 7,451.35'
Inclination: 74.87°
Azimuth: 0.22°
VS: 152.76'

WOB: 41Klbs
Rotary: 40RPM
Strokes: 190SPM
Pump Rate: 583GPM

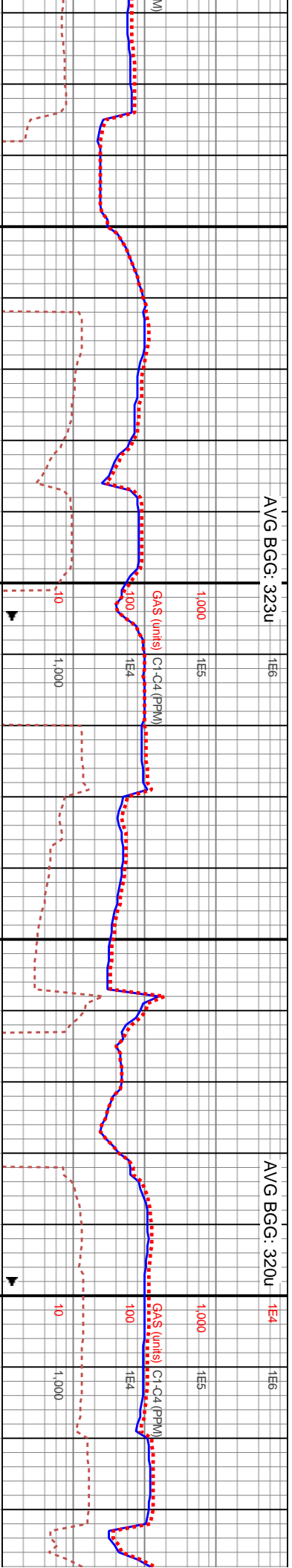
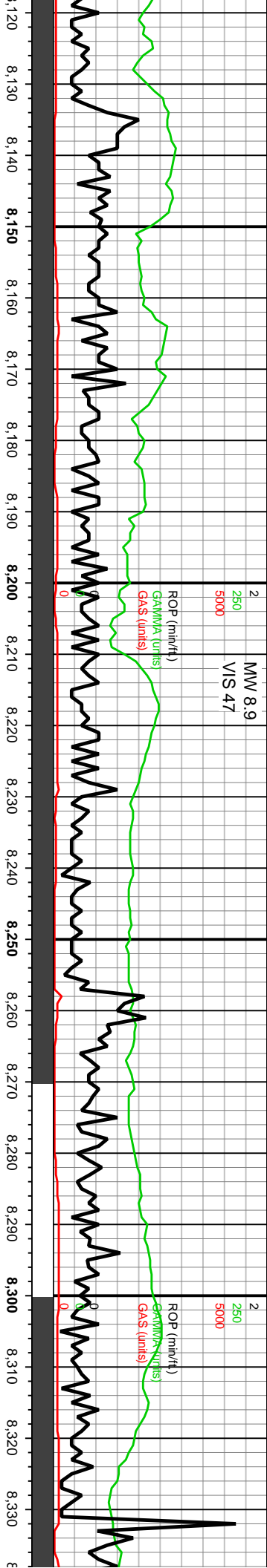
MD: 8,050'
TVD: 7,476.99'
Inclination: 73.47°
Azimuth: 0.29°
VS: 242.77'

ST (80%): pred dk gy, occ gy, l fis sb
cigs, occ brn incl, brn mod calc, wi
gy, med frm-frm mod fis sb rd-sb
rr f wh chk incl, mod-hi calc
7900

7940-8000 MRLST (70%): pred dk gy, occ gy, l fis sb
rd med frm-frm cigs, occ brn incl, brn mod calc, wi
30% CHK: lt gy-gy, med frm-frm mod fis sb rd-sb
ply-sb blkly cigs, v arg LS, rr f wh chk incl & thn elong
lamn, mod-hi calc
7900

8000-8060 MRLST (60%): pred dk gy, occ gy, l fis sb
rd med frm-frm cigs, occ brn incl, brn mod calc, wi
40% CHK: lt gy-gy, med frm-frm mod fis sb rd-sb
ply-sb blkly cigs, v arg LS, rr f wh chk incl & thn elong
lamn, mod-hi calc
7900

8060-8120 MRLST (60%): pred dk gy, occ gy, med
frm-frm l fis sb rd cigs, occ brn incl, dry brn mod
calc, wi 40% CHK: lt gy-gy-dk gy, med frm-frm v arg
LS, mod fis sb rd-sb ply-sb blkly cigs, rr f wh chk
incl & thn elong lamn, mod-hi calc
7900



MD: 8,145'
TVD: 7,502.04'
Inclination: 75.95°
Azimuth: 359.19°
VS: 333.89'

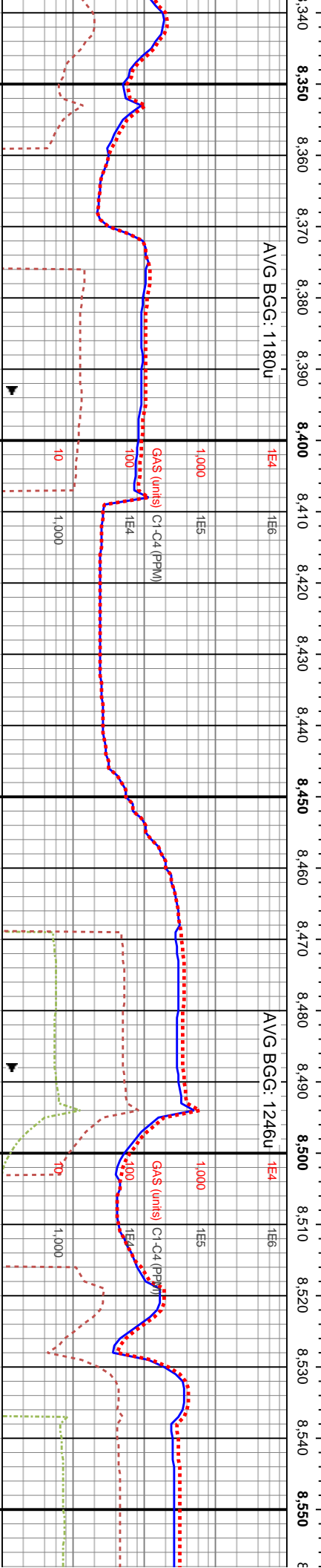
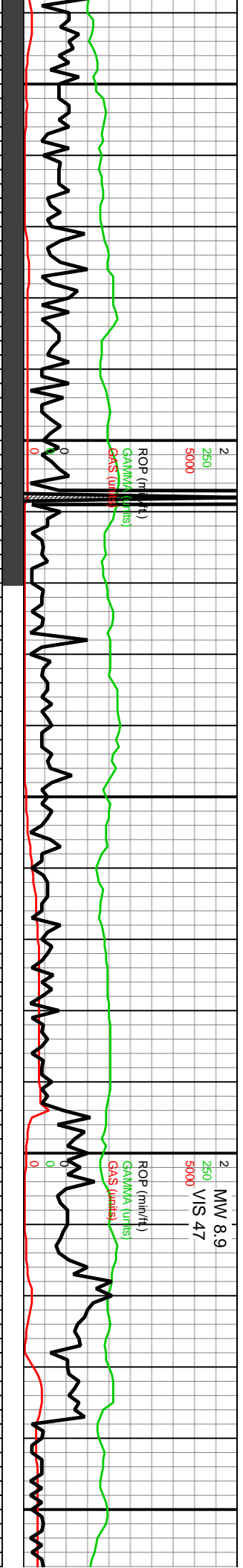
WOB: 52Klbs
Rotary: 0RPM
Strokes: 190SPM
Pump Rate: 582GPM

MD: 8,240'
TVD: 7,515.29'
Inclination: 87.99°
Azimuth: 359.88°
VS: 427.22'

MD: 8,334'
TVD: 7,514'
Inclination: 35°
Azimuth: 359.67°
VS: 520.67'

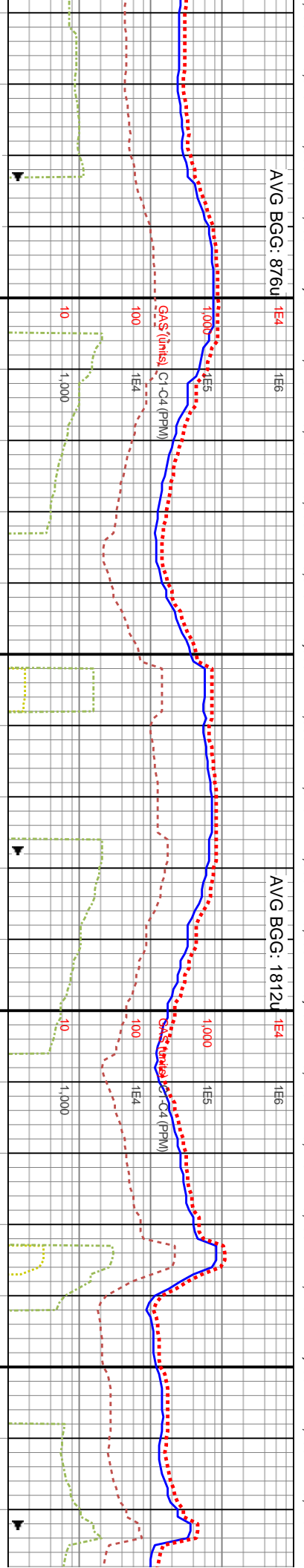
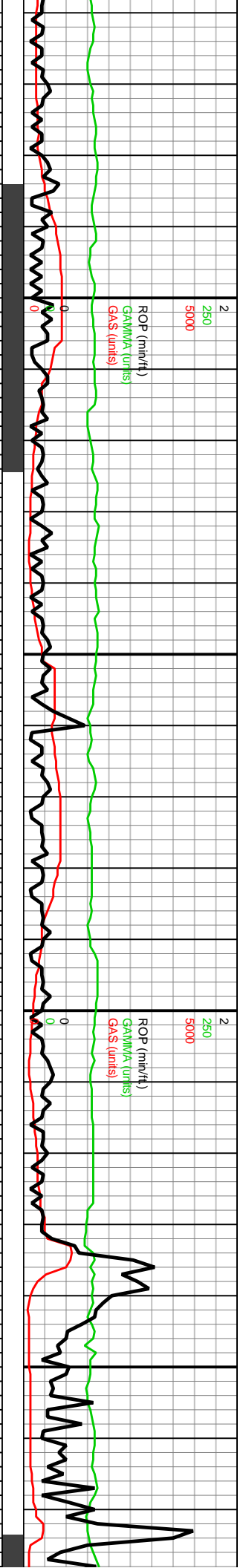
8120-8180 MRLST (50%): pred dk gy, occ gy, l fis sb rd med frm-frm ctgs, occ brn incl, brn mod calc, wi 50% CHK: lt gy-gy, med frm-frm mod fis sb rd-sb ply-sb blkly ctgs, v arg LS, rr f wh chk incl & thn elong lamn, mod-hi calc	8180-8240 70% CHK: lt gy-gy, med frm-frm mod fis sb rd-sb ply-sb blkly ctgs, v arg LS, rr f wh chk incl & thn elong lamn, mod-hi calc MRLST (30%): pred dk gy, occ gy, l fis sb rd med frm-frm ctgs, occ brn incl, rr vf pyr & pyr strg, brn mod calc	8240-8300 70% CHK: pred lt gy-gy, rr dk gy, v arg LS, mod fis med frm-frm sb rd-sb ply-sb blkly ctgs, rr f wh chk incl & thn elong lamn, mod-hi calc MRLST (30%): pred dk gy, occ gy, l fis sb rd med frm-frm ctgs, occ brn incl, rr vf pyr & pyr strg, brn mod calc	8300-8360 80% CHK: lt gy-gy, med frm-frm mod fis sb rd-sb ply-sb blkly ctgs, v arg LS, thn elong lamn, mod-hi calc MRLST (30%): pred dk gy, occ gy, l fis sb rd med frm-frm ctgs, occ brn incl, rr vf pyr & pyr strg, brn mod calc
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WOB: 50Klbs Rotary: 0RPM Strokes: 220SPM Pump Rate: 673GPM		6900	MD: 8,429' TVD: 7,511.1' Inclination: 91.48° Azimuth: 1.81° VS: 615.22'	TVD (ft)	8360-8420 70% CHK:pred lt gy-gy, rr dk gy, v arg LS, mod fis med frm-firm sb rd-sb ply-sb blkly ctgs, rr f wh chk incl & thn elong lamm, mod-hi calc MRLST (30%): pred dk gy, occ gy, l fis sb rd med frm-firm ctgs, occ brn incl, rr vf pyr & pyr strg, brn mod calc	8360-8420 70% CHK:pred lt gy-gy, rr dk gy, v arg LS, mod fis med frm-firm sb rd-sb ply-sb blkly ctgs, rr f wh chk incl & thn elong lamm, mod-hi calc MRLST (30%): pred dk gy, occ gy, l fis sb rd med frm-firm ctgs, occ brn incl, rr vf pyr & pyr strg, brn mod calc	8420-8480 70% CHK:pred lt gy-gy, rr dk gy, v arg LS, mod fis med frm-firm sb rd-sb ply-sb blkly ctgs, rr f wh chk incl & thn elong lamm, mod-hi calc MRLST (30%): pred dk gy, occ gy, l fis sb rd med frm-firm ctgs, occ brn incl, rr vf pyr & pyr strg, brn mod calc	8480-8540 80% CHK:pred lt gy-gy, rr dk gy, v arg LS, mod fis med frm-firm sb rd-sb ply-sb blkly ctgs, rr f wh chk incl & thn elong lamm, mod-hi calc MRLST (20%): pred dk gy, occ gy, l fis sb rd med frm-firm ctgs, occ brn incl, mod brn calc	8540-8600 70% CHK:pred lt gy-gy, rr dk gy, v arg LS, mod fis med frm-firm sb rd-sb ply-sb blkly ctgs, rr f wh chk incl & thn elong lamm, mod-hi calc MRLST (30%): pred dk gy, occ gy, l fis sb rd med frm-firm ctgs, occ brn incl, mod brn calc
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WOB: 40Klbs
Rotary: 60RPM
Strokes: 220SPM
Pump Rate: 674GPM

MD: 8,619'
TVD: 7,514.09'
Inclination: 89.41°
Azimuth: 1.23°
VS: 804.57'

MD: 8,713'
TVD: 7,513.59'
Inclination: 91.2°
Azimuth: 1.45°
VS: 898.28'

CHK: pred lt gy-gy, rr dk gy, v arg LS,
frm sb rd-sb ply-sb blk cy, rr f wh
ong lamm, mod-hi calc MRLST
pred dk gy, occ gy, l fis sb rd med frm-fr
incl, rr vf pyr & pyr strg, brn mod calc

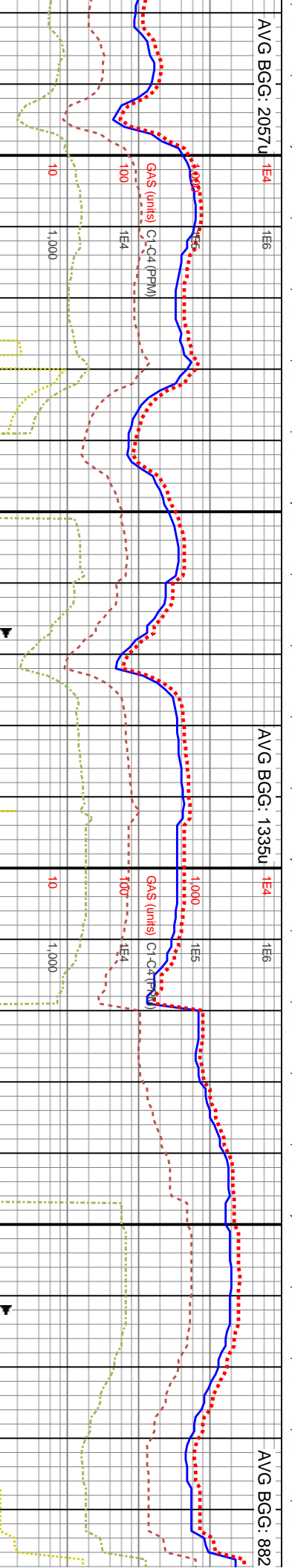
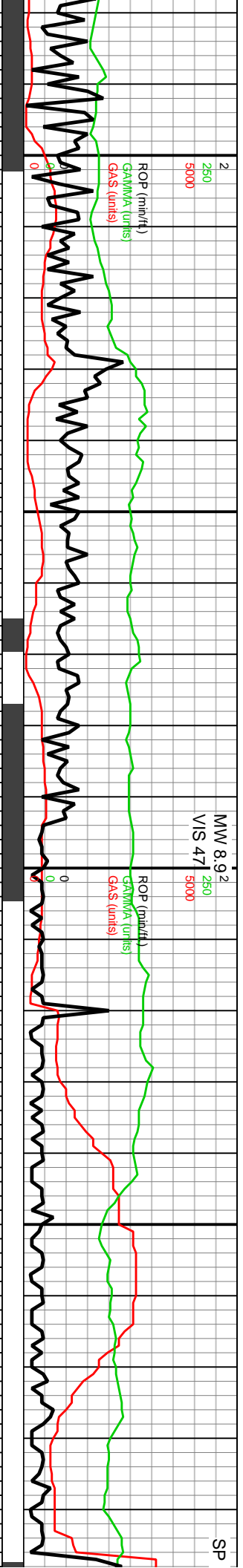
8600-8660 80% CHK: pred lt gy-gy, rr dk gy, v arg LS,
mod fis med frm-frm sb rd-sb ply-sb blk cy, rr f wh
chk incl & thn along lamm, mod-hi calc MRLST (20%):
pred dk gy, occ gy, l fis sb rd med frm-frm cty, occ
brn incl, rr vf pyr & pyr strg, brn mod calc

8660-8720 85% CHK: pred lt gy-gy, rr dk gy, v arg LS,
mod fis med frm-frm sb rd-sb ply-sb blk cy, rr f wh
chk incl & thn along lamm, mod-hi calc MRLST
(15%): pred dk gy, occ gy, l fis sb rd med frm-frm
cty, occ brn incl, mod brn calc

8720-8780 85% CHK: pred lt gy-gy, rr dk gy, v arg LS,
mod fis med frm-frm sb rd-sb ply-sb blk cy, rr f wh
chk incl & thn along lamm, occ c free chk mod-hi calc
MRLST (15%): pred dk gy, occ gy, l fis sb rd med frm-fr
cty, occ brn incl, rr vf pyr & pyr strg, brn mod calc



W
R
S
P



OB: 44Klbs
Rotary: 0RPM
Strokes: 220SPM
Pump Rate: 673GPM

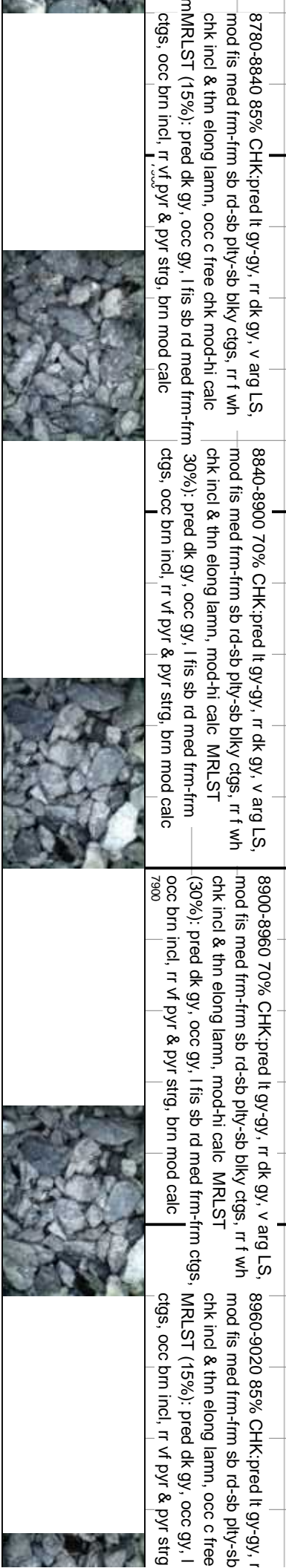
MD: 8,808'
TVD: 7,510.94'
Inclination: 91.99°
Azimuth: 1.74°
VS: 992.98'

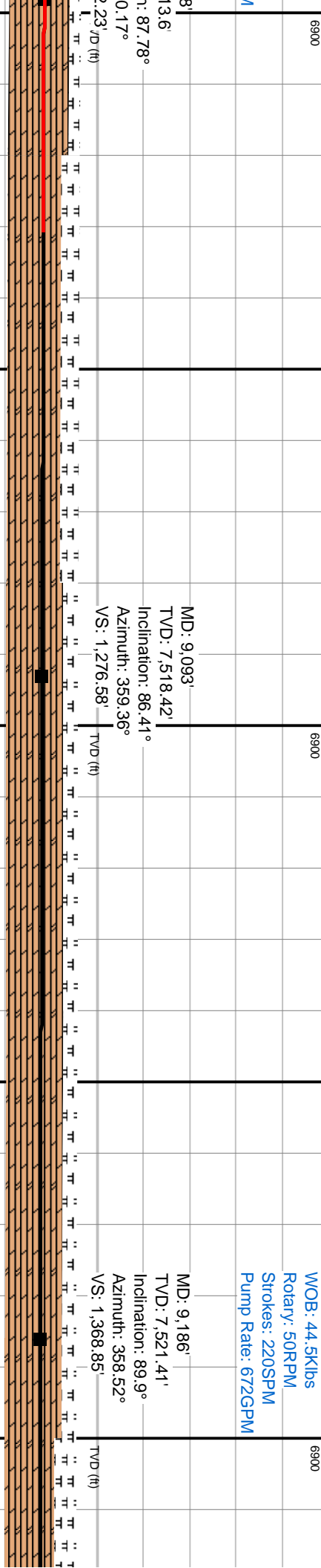
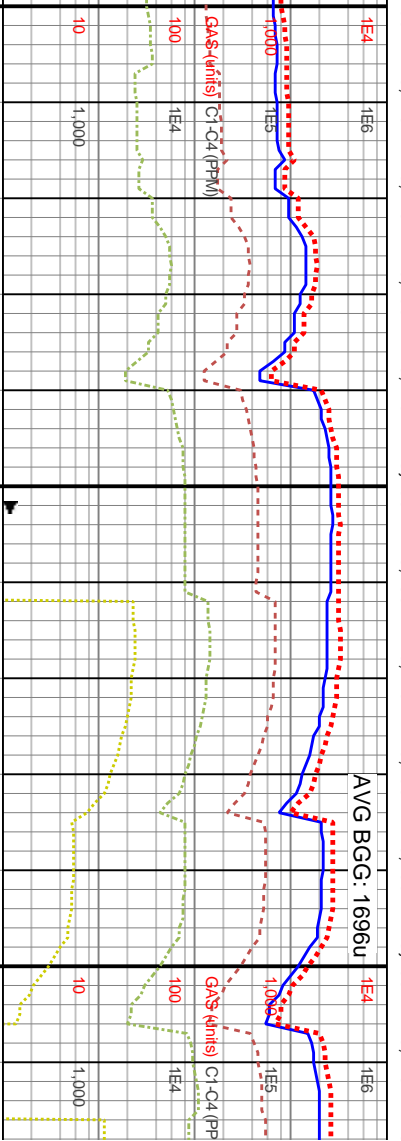
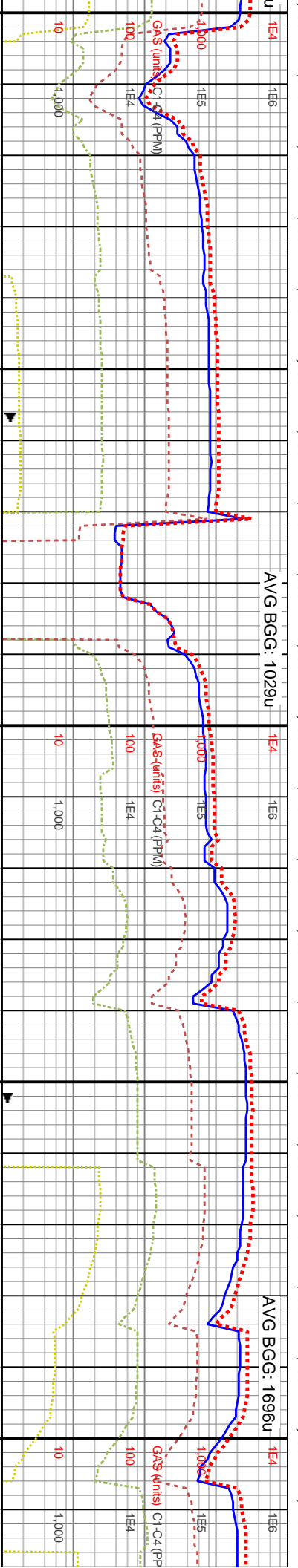
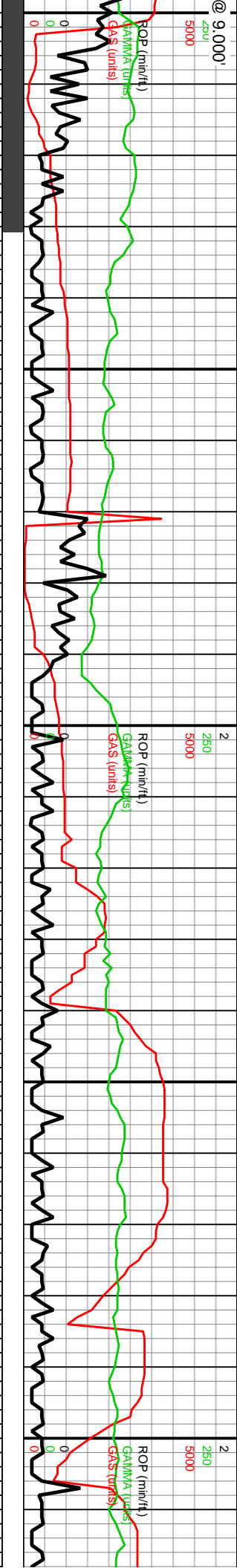
MD: 8,903'
TVD: 7,510.53'
Inclination: 88.51°
Azimuth: 0.95°
VS: 1,087.68'

WOB: 43Klbs
Rotary: 60RPM
Strokes: 220SPM
Pump Rate: 673GPM

MD: 8,99
TVD: 7.5
Inclination:
Azimuth:
VS: 1,182'

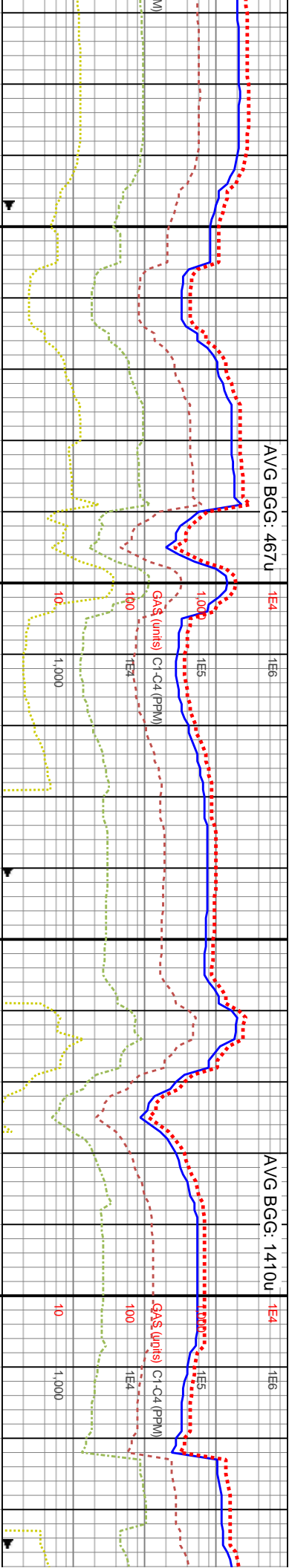
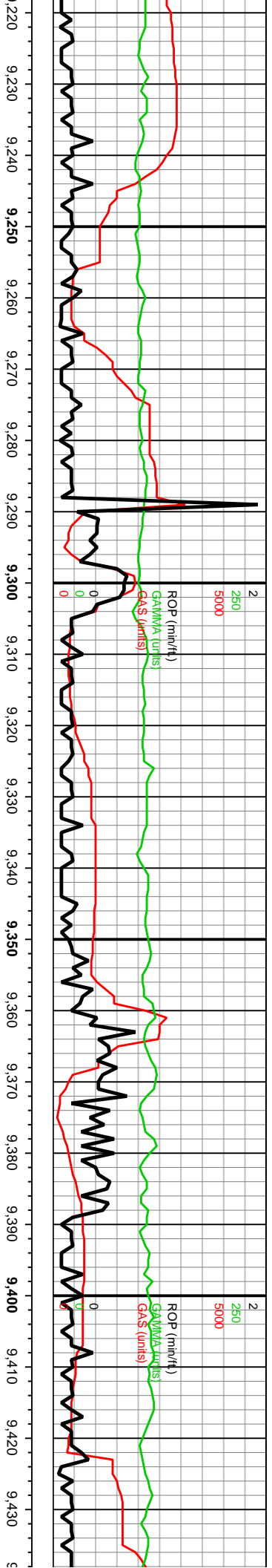
8780-8840 85% CHK:pred lt gy-gy, rr dk gy, v arg LS, mod fis med frm-frm sb rd-sb ply-sb blkly ctgs, rr f wh chk incl & thn elong lamn, occ c free chk mod-hi calc MRLST (15%): pred dk gy, occ gy, l fis sb rd med frm-frm ctgs, occ brn incl, rr vf pyr & pyr strg, brn mod calc	8840-8900 70% CHK:pred lt gy-gy, rr dk gy, v arg LS, mod fis med frm-frm sb rd-sb ply-sb blkly ctgs, rr f wh chk incl & thn elong lamn, mod-hi calc MRLST (30%): pred dk gy, occ gy, l fis sb rd med frm-frm ctgs, occ brn incl, rr vf pyr & pyr strg, brn mod calc	8900-8960 70% CHK:pred lt gy-gy, rr dk gy, v arg LS, mod fis med frm-frm sb rd-sb ply-sb blkly ctgs, rr f wh chk incl & thn elong lamn, mod-hi calc MRLST (30%): pred dk gy, occ gy, l fis sb rd med frm-frm ctgs, occ brn incl, rr vf pyr & pyr strg, brn mod calc	8960-9020 85% CHK:pred lt gy-gy, rr dk gy, v arg LS, mod fis med frm-frm sb rd-sb ply-sb blkly ctgs, rr f wh chk incl & thn elong lamn, occ c free MRLST (15%): pred dk gy, occ gy, l fis sb rd med frm-frm ctgs, occ brn incl, rr vf pyr & pyr strg
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9020-9080 CHK (75%): predy lt gy-gy, occly bnshty, v arg ls, mod fis frm sb pty-sb blkly ctgs, rr f wh chk incl & thn lamn, occ c free chk, mod-hi calc: MRLST (25%): predy dk gy, occ gy, fis sb blkly med frm ctgs, occ brn incl, rr vf pyr & pyrc nod, occ lse brn cal	9080-9140 CHK (80%): predy lt gy, occly bnshty, v arg ls, mod fis frm sb pty-sb blkly ctgs, rr f wh chk incl & thn lamn, occ c free chk, hi calc: MRLST (20%): predy dk gy, occ gy, fis sb blkly med frm ctgs, occ brn incl, rr vf pyr & pyrc nod, occ lse brn cal	9140-9200 CHK (80%): predy lt gy, occly bnshty, v arg ls, mod fis frm sb pty-sb blkly ctgs, rr f wh chk incl & thn lamn, occ c free chk, hi calc: MRLST (20%): predy dk gy, occ gy, fis sb blkly med frm ctgs, occ brn incl, abnt pyr & pyrc nod, tr lse brn cal
9020-9080 CHK (75%): predy lt gy-gy, occly bnshty, v arg ls, mod fis frm sb pty-sb blkly ctgs, rr f wh chk incl & thn lamn, occ c free chk, mod-hi calc: MRLST (25%): predy dk gy, occ gy, fis sb blkly med frm ctgs, occ brn incl, rr vf pyr & pyrc nod, occ lse brn cal	9080-9140 CHK (80%): predy lt gy, occly bnshty, v arg ls, mod fis frm sb pty-sb blkly ctgs, rr f wh chk incl & thn lamn, occ c free chk, hi calc: MRLST (20%): predy dk gy, occ gy, fis sb blkly med frm ctgs, occ brn incl, rr vf pyr & pyrc nod, occ lse brn cal	9140-9200 CHK (80%): predy lt gy, occly bnshty, v arg ls, mod fis frm sb pty-sb blkly ctgs, rr f wh chk incl & thn lamn, occ c free chk, hi calc: MRLST (20%): predy dk gy, occ gy, fis sb blkly med frm ctgs, occ brn incl, abnt pyr & pyrc nod, tr lse brn cal





MD: 9,280'
TVD: 7,520.79'
Inclination: 90.86°
Azimuth: 357.4°
VS: 1,461.96'

TVD (ft)

MD: 9,375'
TVD: 7,519.11'
Inclination: 91.16°
Azimuth: 356.93°
VS: 1,555.87'

TVD (ft)

WOB: 41.8klbs
Rotary: 70RPM
Strokes: 220SPM
Pump Rate: 672GPM

(70%): predy lt gy-bnshgy, v arg ls, 9260-9320 CHK (70%): predy lt gy, occlly bnshgy, v arg ls, mod fis frm sb ply-sb blkly ctgs, rr f wh chk incl & thn lamm, occ c free chk, hi calc: MRLST (30%): predy dk gy, occ gy, fis sb blkly med frm ctgs, occ brn incl, tr pyr & pyrc nod, occ lse brn cal

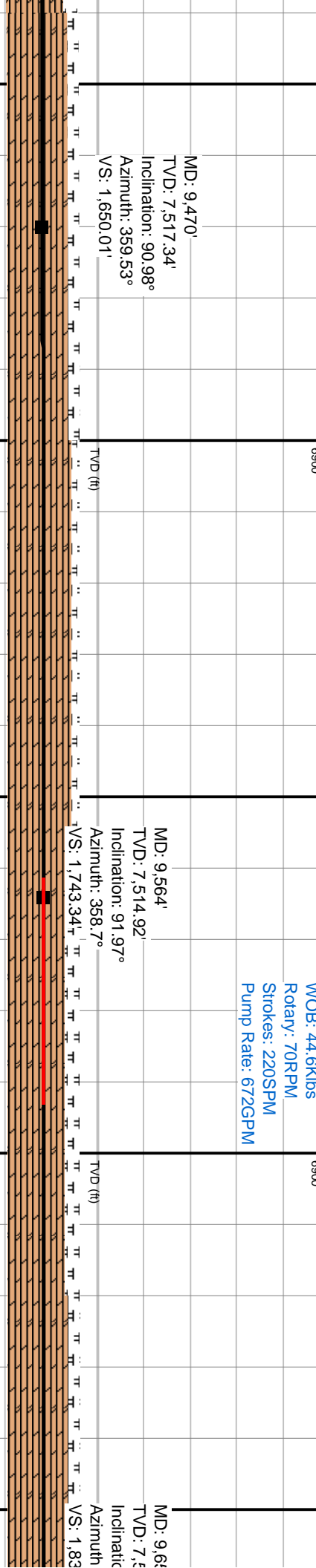
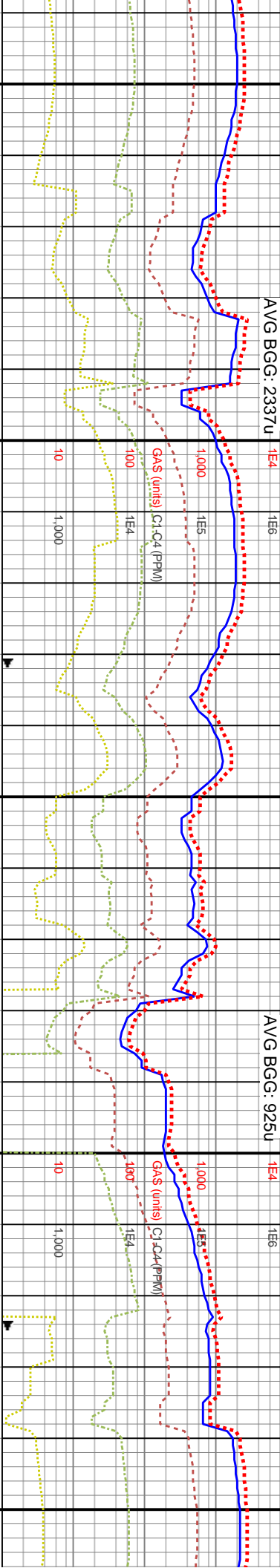
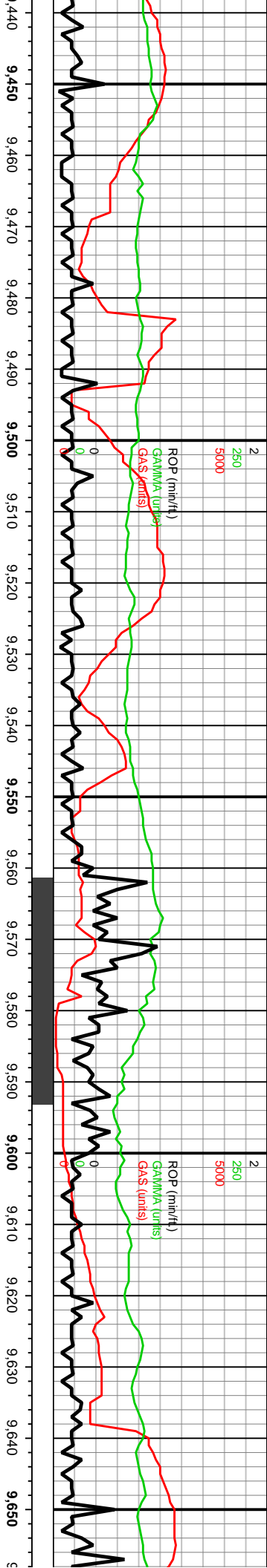
9320-9380 CHK (80%): predy lt gy, occlly bnshgy, v arg ls, mod fis, frm, sb ply-sb blkly, occ f wh chk incl & thn lamm, occ c free chk, hi calc: MRLST (20%): gy-dk gy, fis, sb blkly-blky, med frm-brit, occ brn incl, tr imbd pyr & scat pyrc nod

9380-9440 CHK (80%): predy lt gy, occlly bnshgy, v arg ls, mod fis, frm, sb ply-sb blkly, occ f wh chk incl & thn lamm, occ c free chk, hi calc: MRLST (20%): gy-dk gy, fis, sb blkly-blky, med frm-brit, occ brn incl, tr imbd pyr

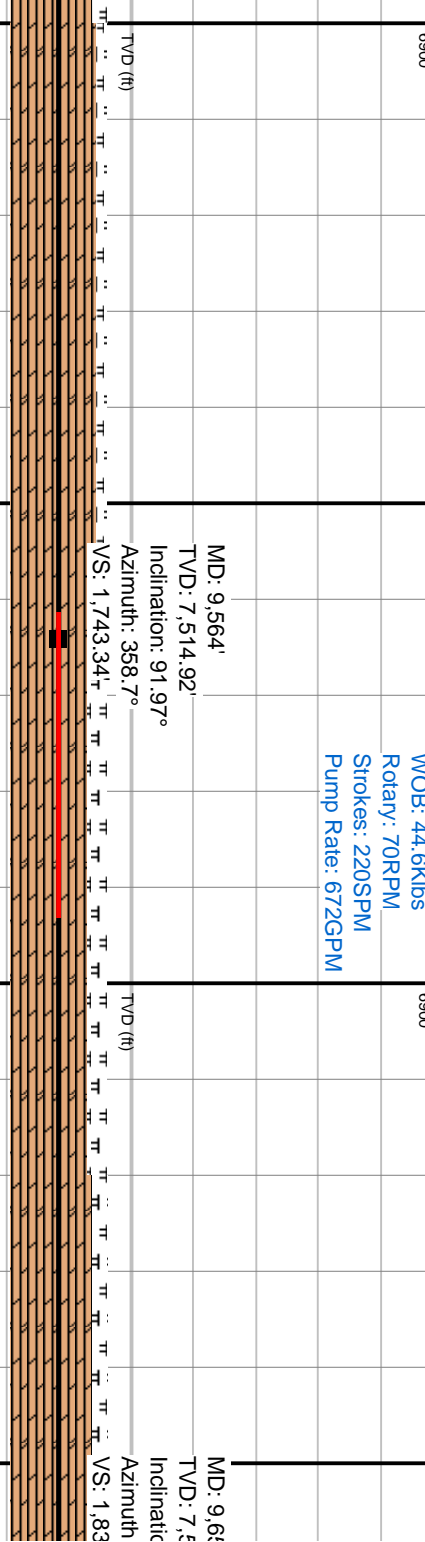
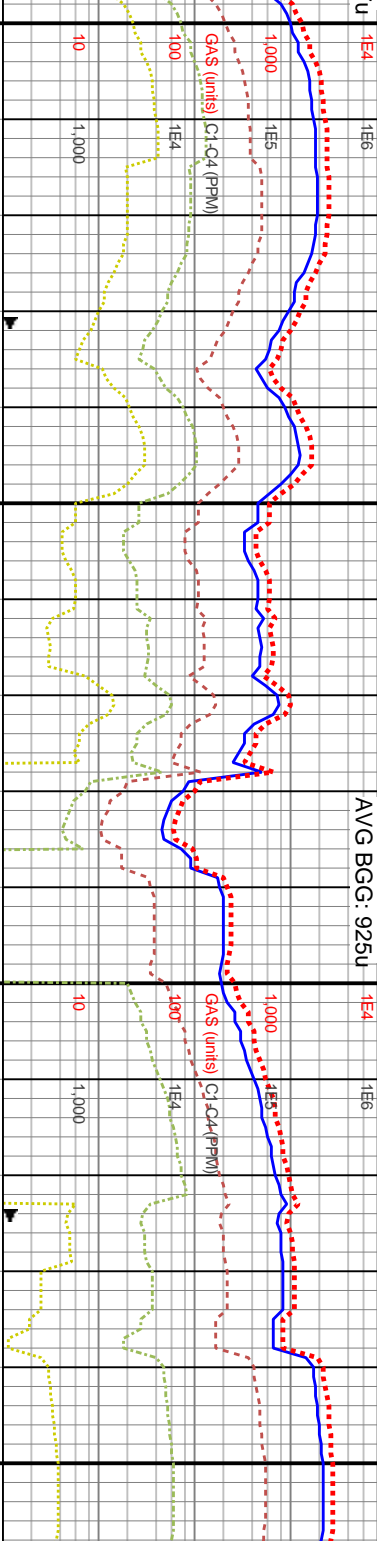
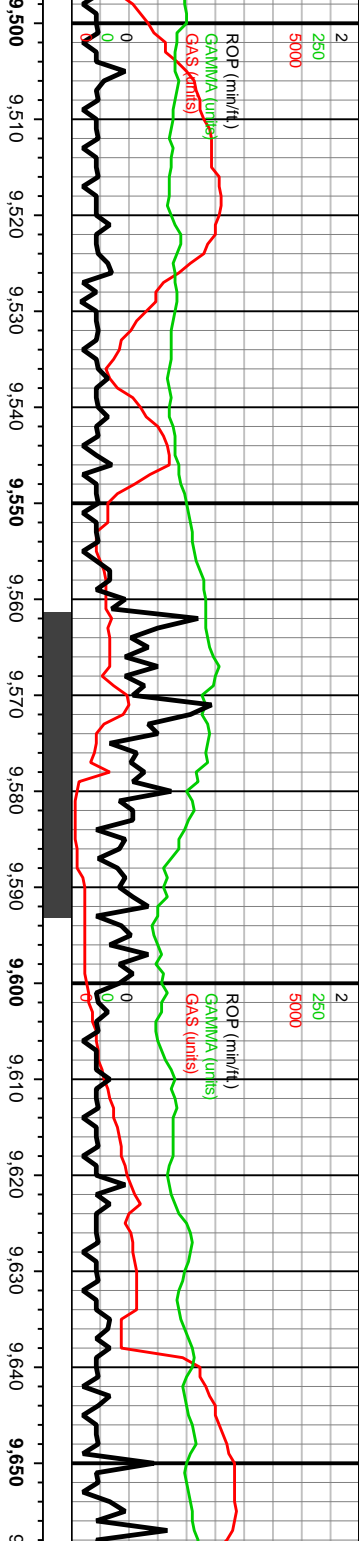
7900

7900

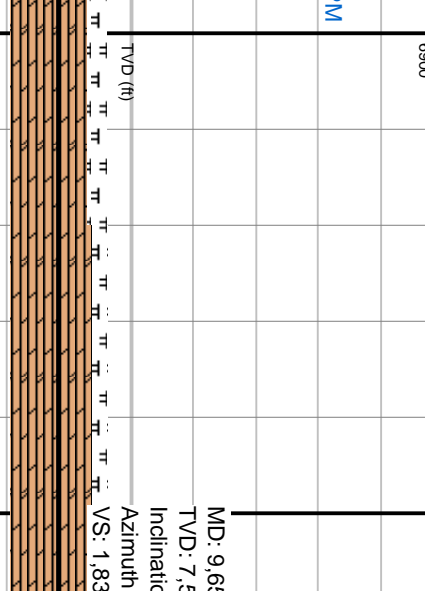
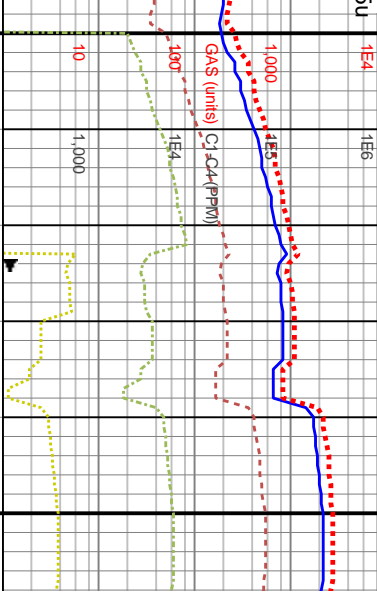
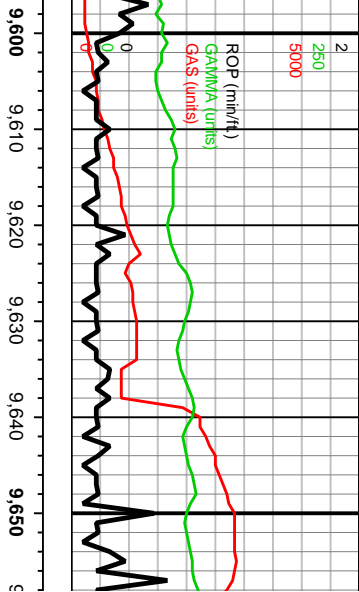




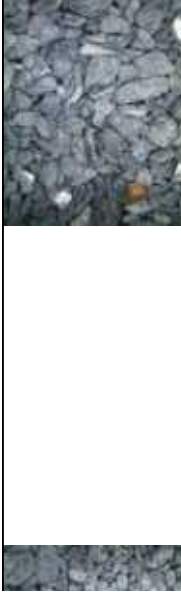
9440-9500 CHK (85%): lt-med gy, v arg is, mod fis, frm, sb ply-sb blk, occ f wh chk incl & thn lamn, occ c free chk, hi calc: MRLST (15%): gy-dk gy, fis, sb blk, blk, frm-sl brit, occ brn incl, tr imbd pyr



9500-9560 CHK (90%): predy lt gy, occly bnshgy, v arg is, mod fis, frm, sb ply-sb blk, occ f wh chk incl & thn lamn, occ c free chk, hi calc: MRLST (10%): dk gy, fis, sb blk, blk, med frm-brit, occ brn incl, tr imbd pyr & mic pyr spec

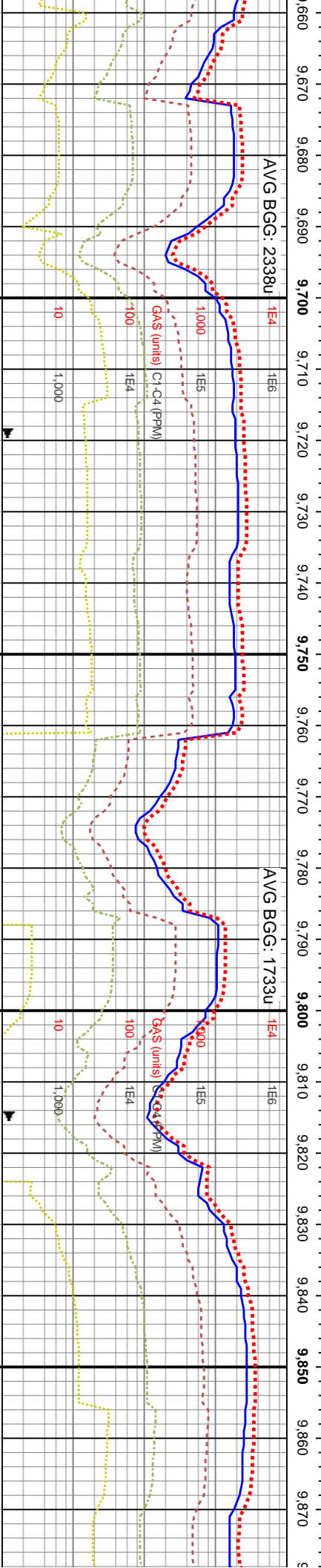
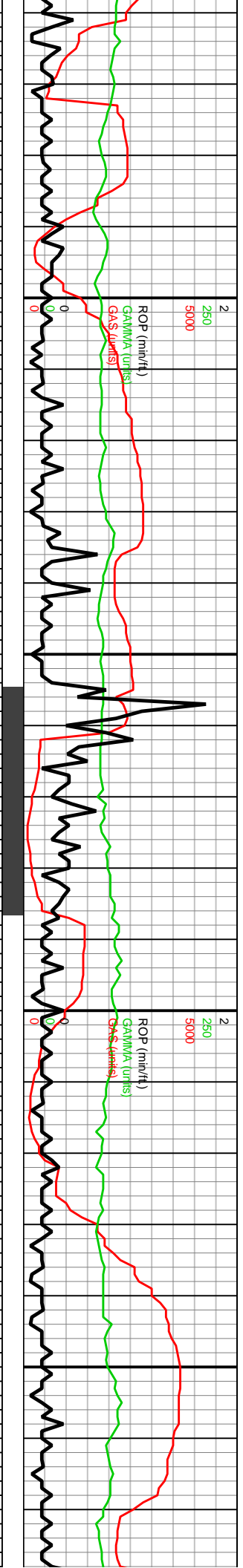


9560-9620 CHK (80%): predy lt-med gy, occly bnshgy, mod fis, frm, sb ply-sb blk, rr f wh chk incl & thn lamn, occ c free chk, hi calc: MRLST (20%): gy-dk gy, fis, sb blk, blk, med frm-brit, occ brn incl, tr imbd pyr & scat lse cal



9620-9680 CHK (85%): predy lt-med gy, mod fis, frm, sb blk, rr f wh chk incl free chk, hi calc: MRLST (15%): gy-blk, blk, med frm-brit, occ brn incl, lse cal





AVG BGG: 2338u

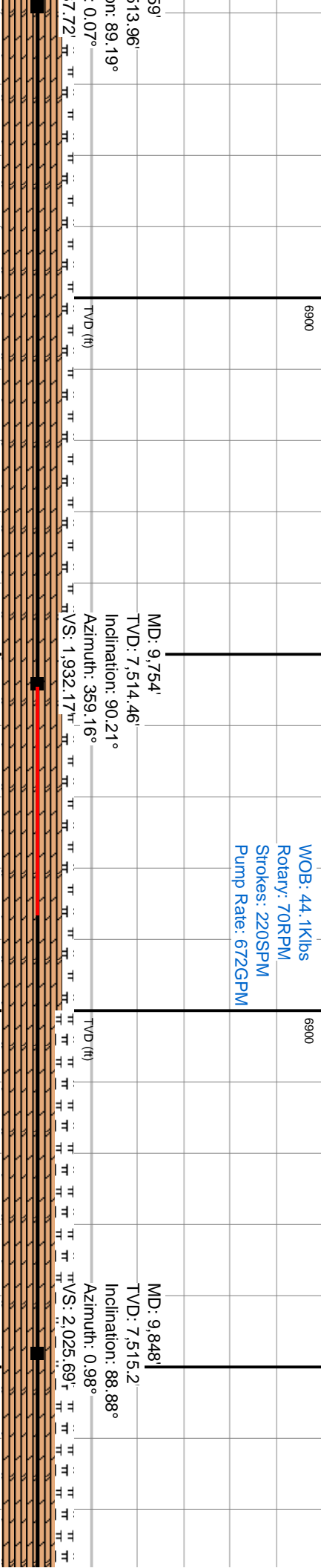
ROP (min/hr)
GAMMA (units)
GAS (units)

1E4 1E6
1,000 1E5
100 1E4
10 1,000

AVG BGG: 1733u

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

1E4 1E6
1,000 1E5
100 1E4
10 1,000



AVG BGG: 2338u

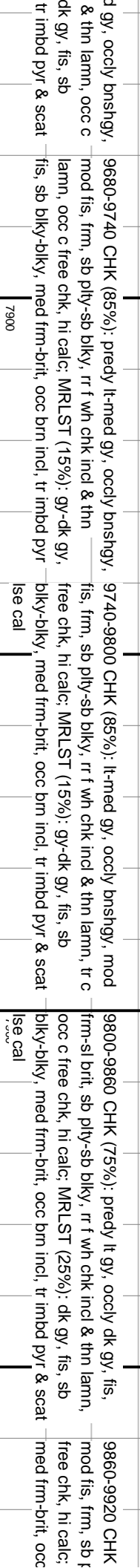
ROP (min/hr)
GAMMA (units)
GAS (units)

1E4 1E6
1,000 1E5
100 1E4
10 1,000

AVG BGG: 1733u

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

1E4 1E6
1,000 1E5
100 1E4
10 1,000



AVG BGG: 2338u

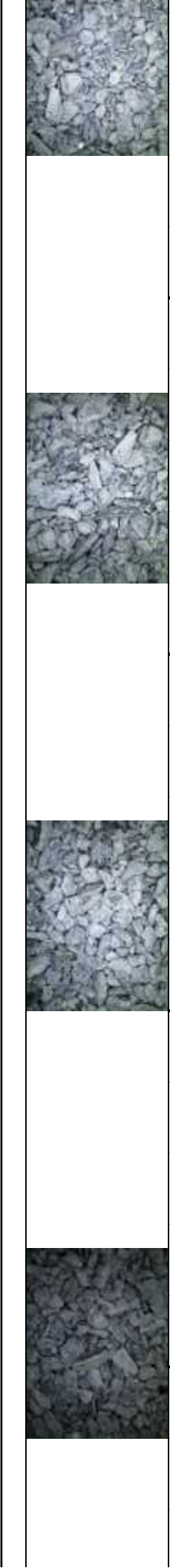
ROP (min/hr)
GAMMA (units)
GAS (units)

1E4 1E6
1,000 1E5
100 1E4
10 1,000

AVG BGG: 1733u

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

1E4 1E6
1,000 1E5
100 1E4
10 1,000



AVG BGG: 2338u

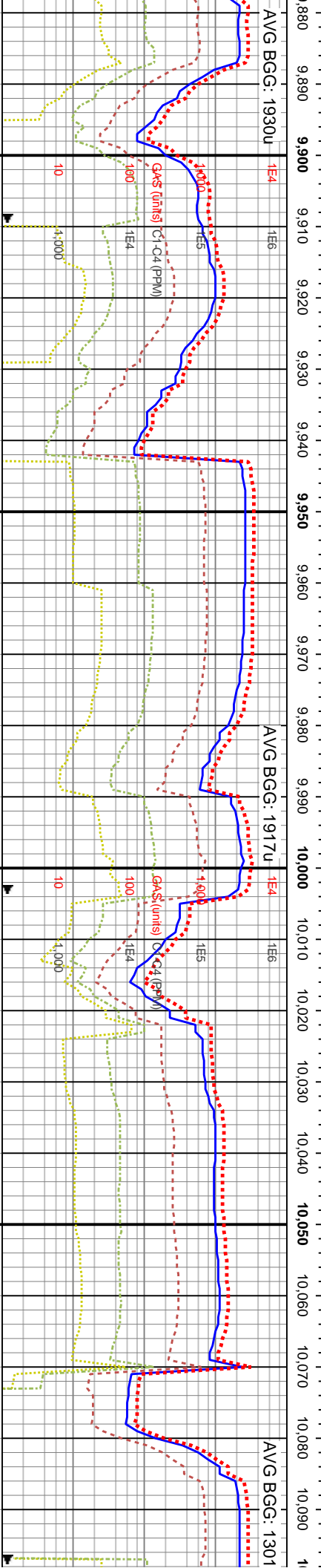
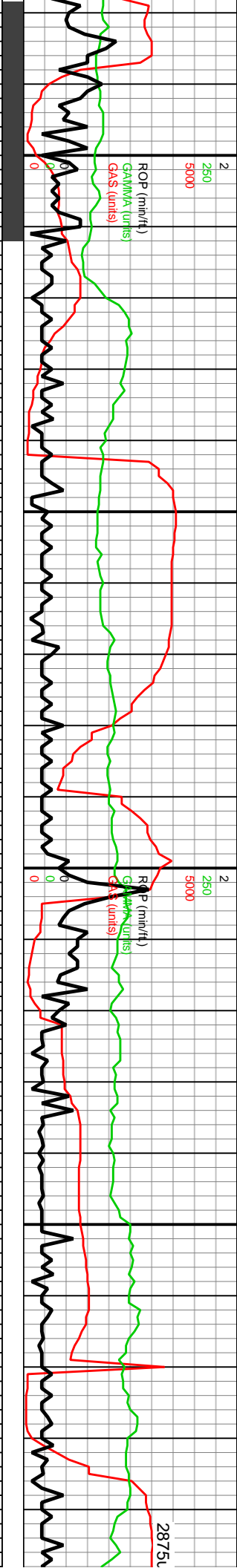
ROP (min/hr)
GAMMA (units)
GAS (units)

1E4 1E6
1,000 1E5
100 1E4
10 1,000

AVG BGG: 1733u

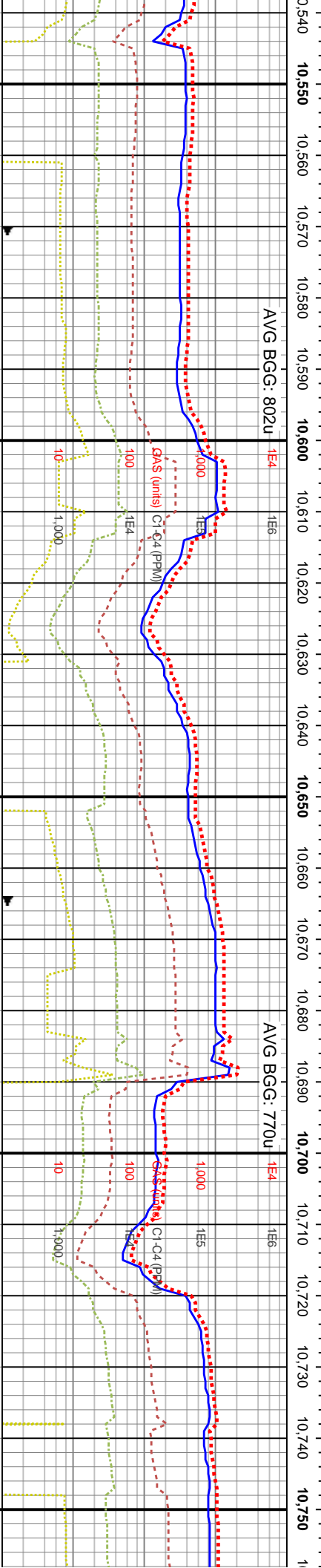
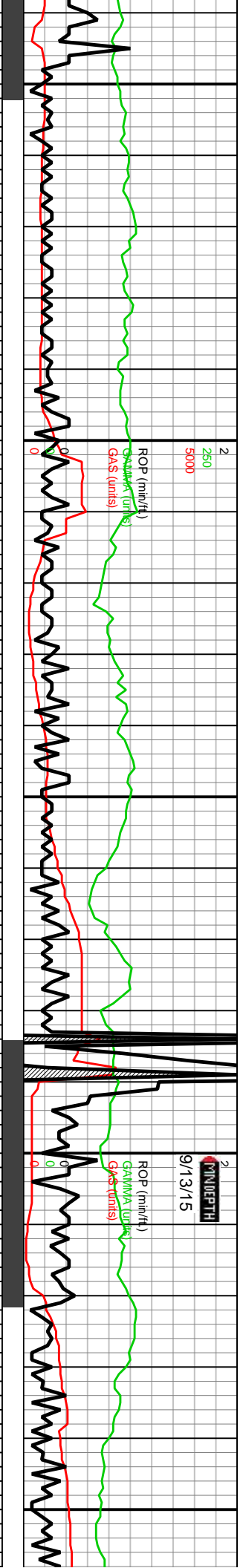
ROP (min/hr)
GAMMA (units)
GAS (units)

1E4 1E6
1,000 1E5
100 1E4
10 1,000



MD: 9,943' TVD: 7,517.03' Inclination: 88.92° Azimuth: 359.87°		MD: 10,037' TVD: 7,519.39' Inclination: 88.2° Azimuth: 359.41° VS: 2,213.67'	
VS: 2,120.25'		VS: 2,213.67'	
TVD (ft)		TVD (ft)	
9920-9980 CHK (70%): predy lt-med gy, occly bshgy, mod fis, frm, sb ply-sb blk, rr f wh chk incl & thn lamm, occ c free chk, hi calc: MRLST (30%): gy-dk gy, fis, sb blk-bkly, med frm-brit, occ brn incl, tr imbd pyr & scat lse cal		9980-10040 CHK (70%): med gy, occly bshgy, fis, frm, sb ply-sb blk, rr f wh chk incl & thn lamm, occ c free chk, hi calc: MRLST (30%): gy-dk gy, fis, sb blk-bkly, med frm-brit, occ brn incl, tr imbd pyr & scat lse cal	
7900		7900	





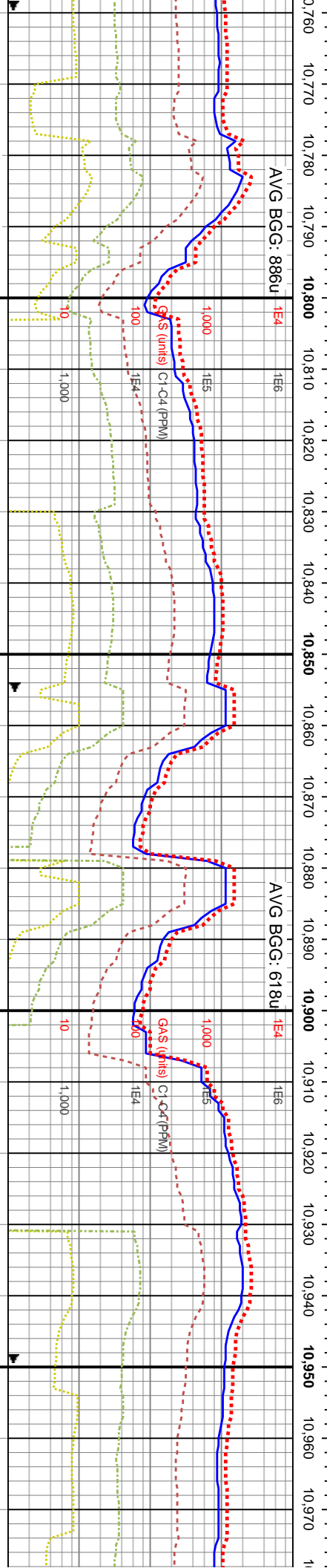
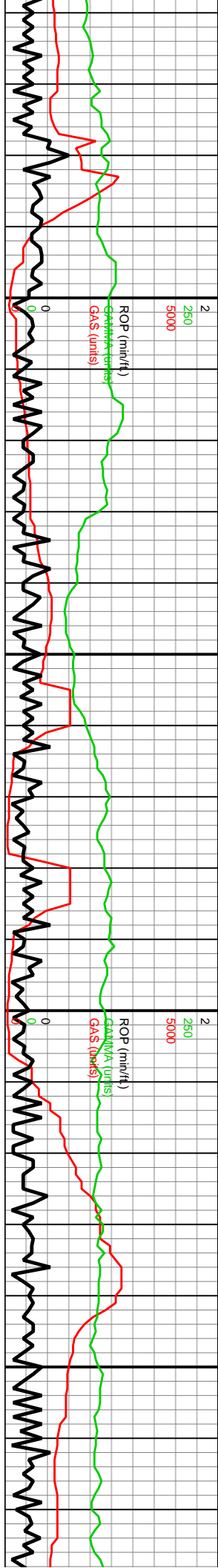
WOB: 28.8klbs
Rotary: 50RPM
Strokes: 220SPM
Pump Rate: 673GPM

MD: 10,605'
TVD: 7,525.77'
Inclination: 89.53°
Azimuth: 0.83°
VS: 2,778.64'

MD: 10,699'
TVD: 7,526.69'
Inclination: 89.35°
Azimuth: 2.95°
VS: 2,872.41'

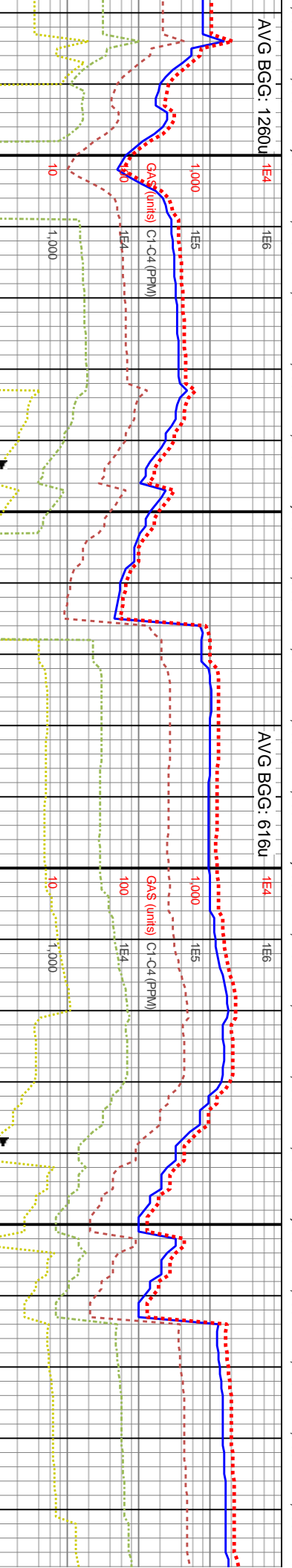
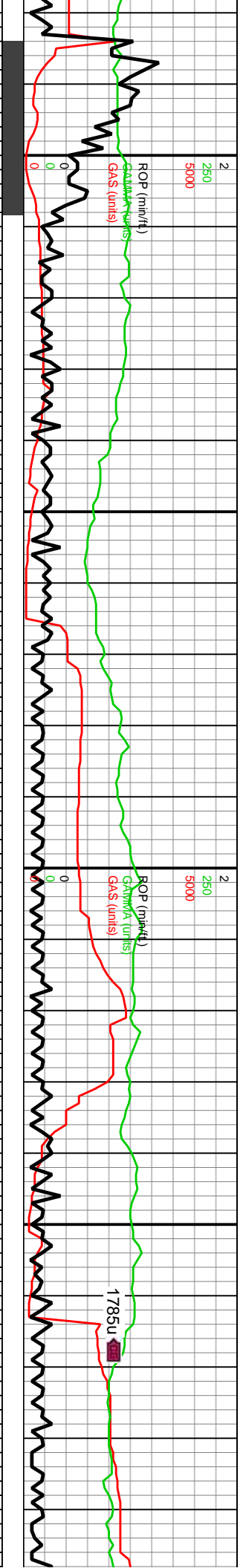
CHK (80%): predy lt-med gy, occly brt, sb blkly, rr f wh chk incl & thn chk, hi calc: MRLST (20%): gy-dk gy, med frm-brt, occ brn incl, tr imbd pyr	10580-10640 CHK (80%): predy lt-med gy, occly bnshgy, fis, frm-brt, sb blkly, rr f wh chk incl & thn lamm, occ c free chk, hi calc: MRLST (20%): gy-dk gy, fis, sb blkly-blky, med frm-brt, occ brn incl, tr imbd pyr & scat lse cal	10640-10700 CHK (70%): predy lt-med gy, occly bnshgy, fis, frm-brt, sb blkly, rr f wh chk incl & thn lamm, occ c free chk, hi calc: MRLST (30%): gy-dk gy, fis, sb blkly-blky, med frm-brt, occ brn incl, tr imbd pyr, pyrc nod & scat lse cal	10700-10760 CHK (70%): lt-med gy, fis, frm-brt, sb blkly, rr f wh chk incl & thn lamm, occ c free chk, hi calc: MRLST (30%): gy-dk gy, fis, sb blkly-blky, med frm-brt occ brn incl, tr imbd pyr & scat lse cal
	7900		7900





WOB: 29.3Klbs Rotary: 60RPM Strokes: 220SPM Pump Rate: 672GPM		6900	MD: 10,794' TVD: 7,526.59' Inclination: 90.77° Azimuth: 3.27° VS: 2,967.31'		TVD (ft)
10760-10820 CHK (70%): med gy-bnshgy, fis,	10820-10880 CHK (85%): predy lt-med gy, occly	10880-10940 CHK (75%): predy lt-med gy, occly	10940-11000 CHK (75%): predy lt-	11000-11060 CHK (75%): predy lt-	11060-11120 CHK (75%): predy lt-
frm-brit, sb blkly, occ f wh chk incl & thn lamn, tr c free	bnshgy, fis, frm-brit, sb blkly, rr f wh chk incl & thn	bnshgy, fis, frm-brit, sb blkly-sb ply, rr f wh chk incl &	bnshgy, fis, frm-brit, sb blkly, rr f wh chk incl &	bnshgy, fis, frm-brit, sb blkly, rr f wh chk incl &	bnshgy, fis, frm-brit, sb blkly, rr f wh chk incl &
chk, hi calc: MRLST (30%): gy-dk gy, fis, sb blkly-blky,	lamn, occ c free chk, hi calc: MRLST (15%): gy-dk gy,	thn lamn, occ c free chk, hi calc: MRLST (25%): gy-dk	thn lamn, occ c free chk, hi calc: MRLST (25%): gy-dk	thn lamn, occ c free chk, hi calc: MRLST (25%): gy-dk	thn lamn, occ c free chk, hi calc: MRLST (25%): gy-dk
med frm-brit, abnt brn incl, tr imbd pyr & scat lse cal	gy, fis, sb blkly-blky, med frm-brit, occ brn incl, tr imbd pyr	gy, fis, sb blkly-sb ply, med frm-brit, occ brn incl, tr	gy, fis, sb blkly-sb ply, med frm-brit, occ brn incl, tr	gy, fis, sb blkly-sb ply, med frm-brit, occ brn incl, tr	gy, fis, sb blkly-sb ply, med frm-brit, occ brn incl, tr
7900					





OIB: 26.7Klbs
Rotary: 65RPM
Strokes: 220SPM
Pump Rate: 672GPM

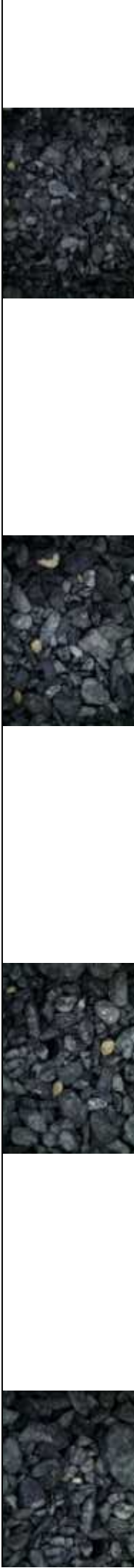
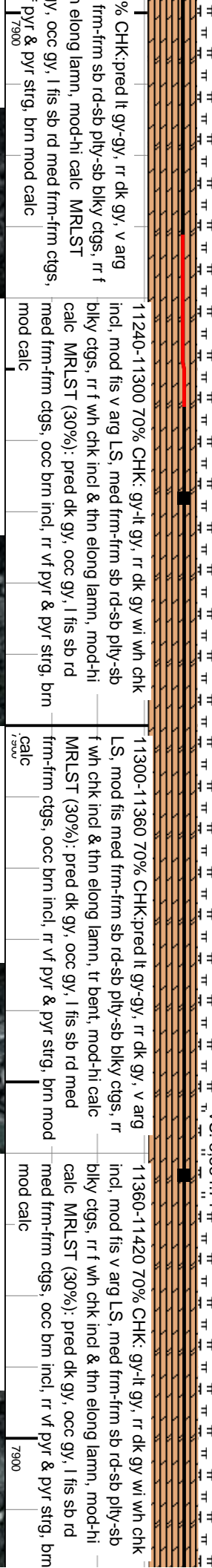
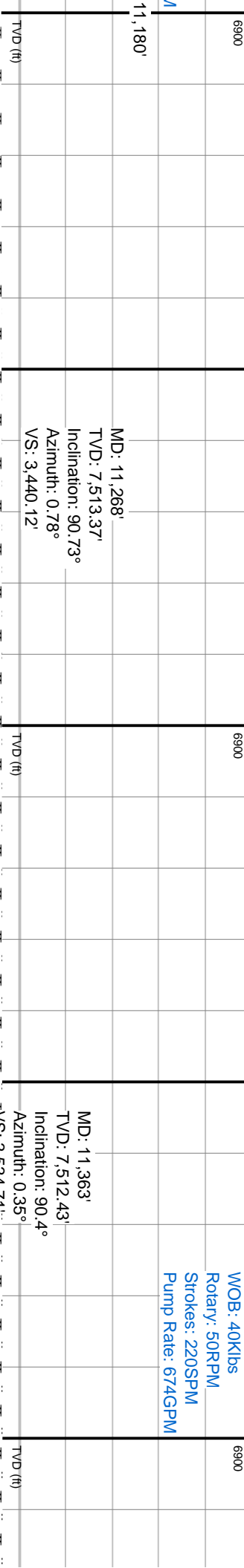
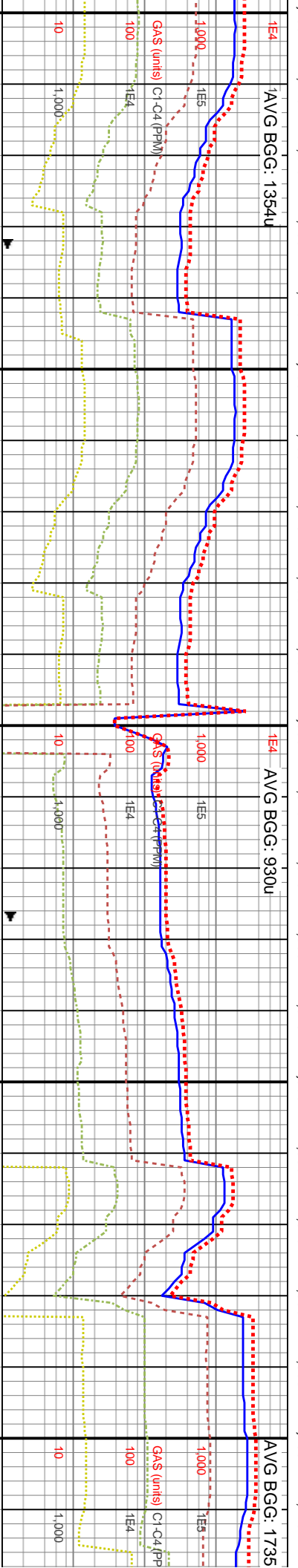
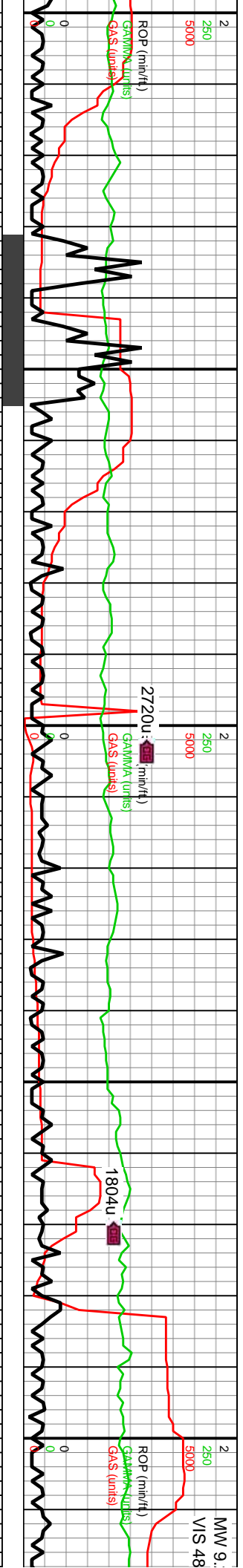
MD: 10,983'
TVD: 7,523.98'
Inclination: 92.61°
Azimuth: 2.5°
VS: 3,156.04'

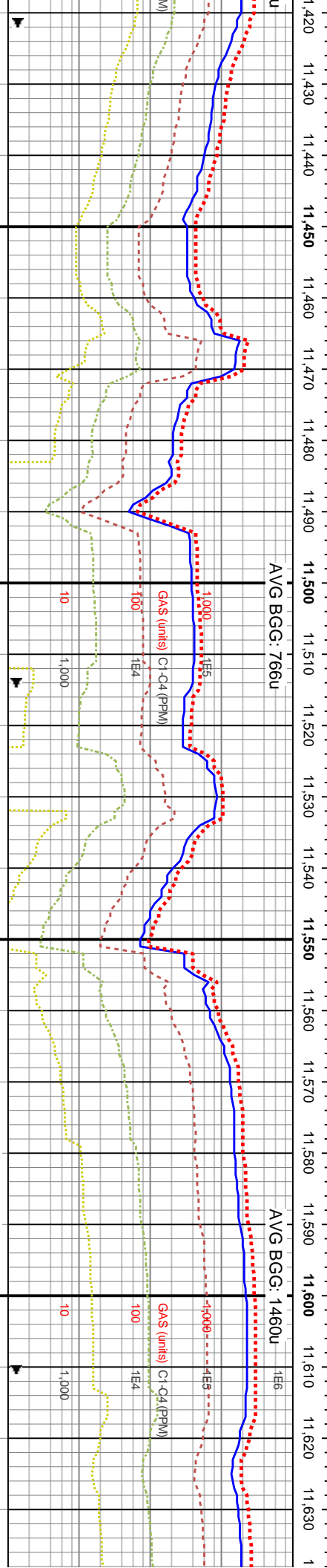
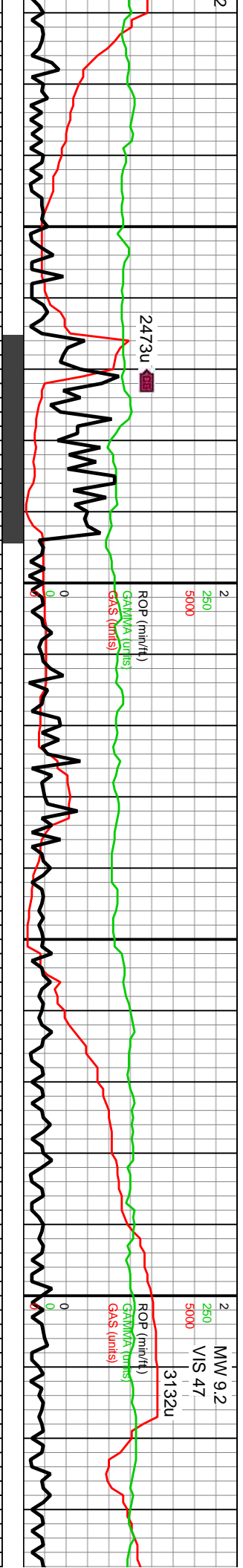
MD: 11,078'
TVD: 7,519.75'
Inclination: 92.49°
Azimuth: 2.23°
VS: 3,250.77'

MD: 11,173'
TVD: 7,515.83'
Inclination: 92.24°
Azimuth: 1.5°
VS: 3,345.47'

med gy, occy	11000-11060 CHK (80%): predy lt-med gy, occy	11060-11120 CHK (80%): lt-med gy-bnshgy, fis	11120-11180 CHK (70%): lt-med gy-bnshgy, mod fis,	11180-11240 70
chk incl & thn	bnshgy, fis, frm-brit, sb blkly, rr f wh chk incl & thn	frm-brit, sb blkly, rr f wh chk incl & thn lamn, occ c free	frm-brit, sb blkly-blky, rr f wh chk incl & thn lamn, occ c	LS, mod fis med
T (25%): gy-dk gy,	lamn, occ c free chk, hi calc; MRLST (20%): gy-dk gy,	frm-brit, sb blkly, rr f wh chk incl & thn lamn, occ c free	frm-brit, sb blkly-blky, rr f wh chk incl & thn lamn, occ c	wh chk incl & thn
frm incl, tr scat lse	fis, sb blkly-blky, med frm-brit, occ brn incl, tr scat lse	chk, hi calc; MRLST (20%): dk gy, fis, sb blkly, med	free chk, hi calc; MRLST (30%): med-dk gy, fis, sb blkly,	(30%): pred dk g
	cal & pyrc nod	frm-brit, occ brn incl, tr scat lse cal & pyrc nod	med frm-brit, occ brn incl, tr scat lse cal	occ brn incl, rr vi

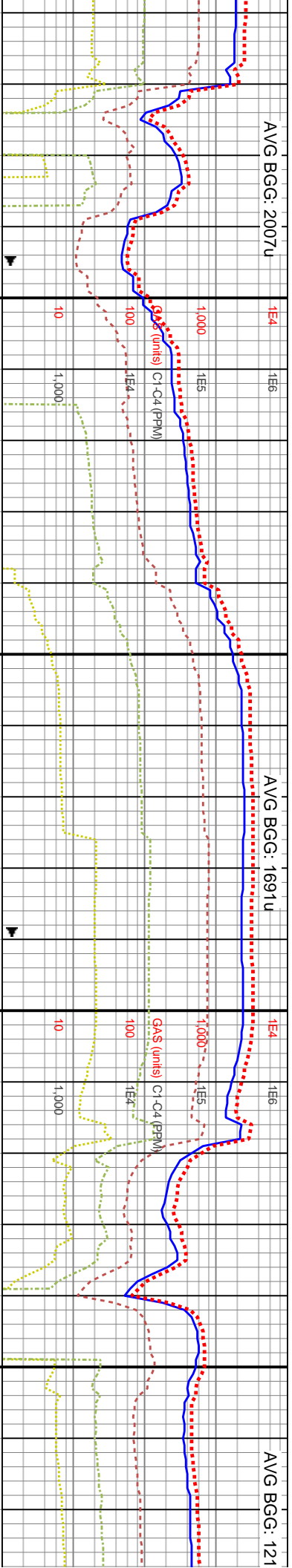
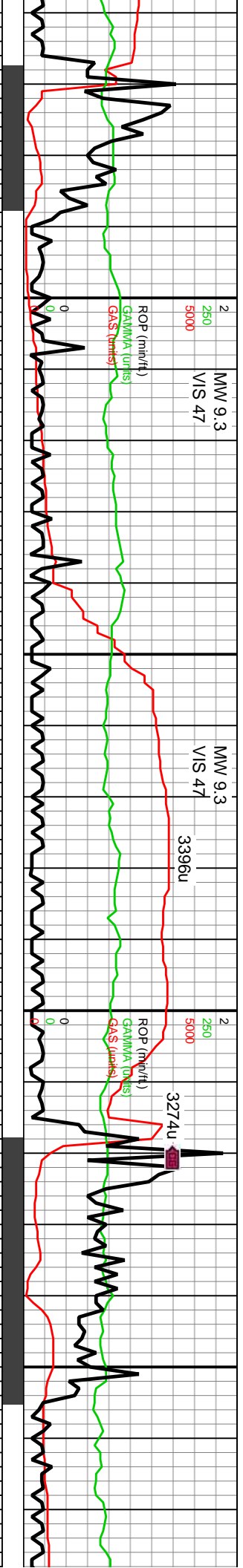






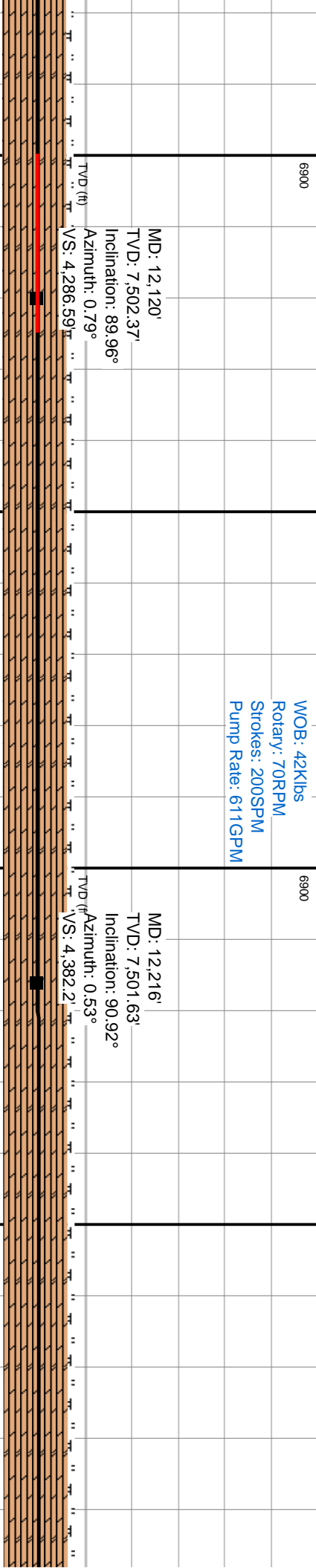
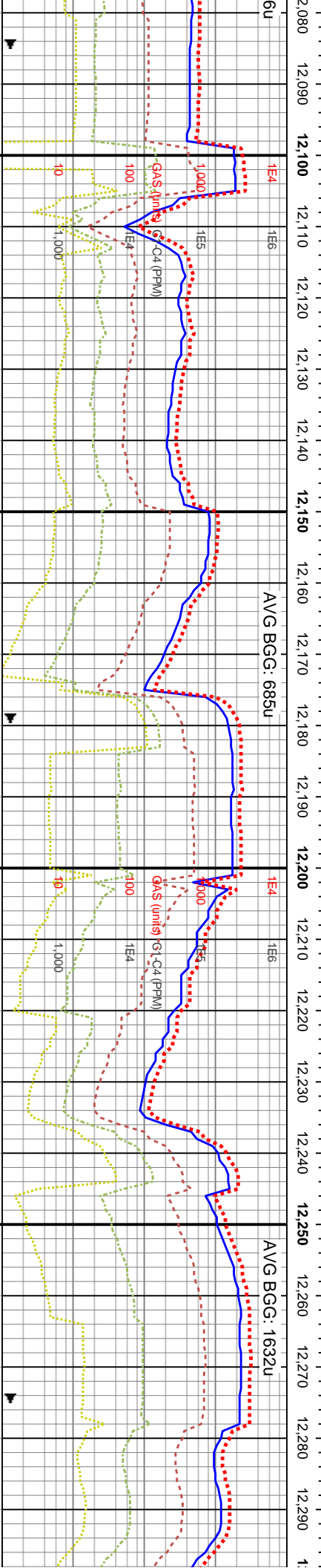
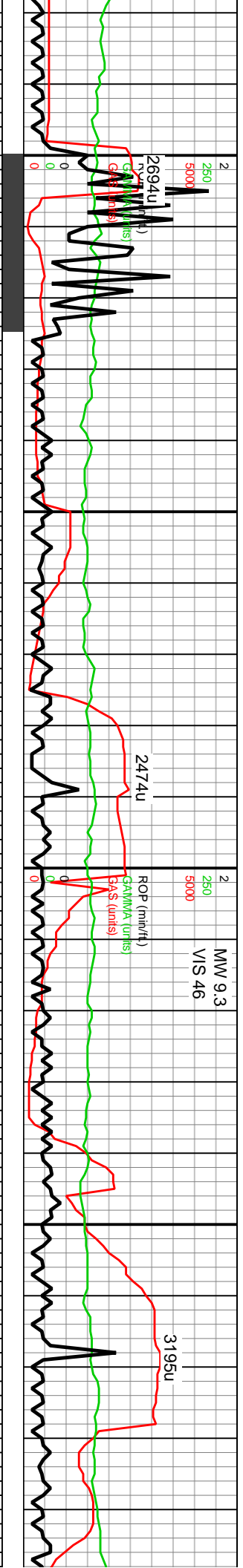
MD: 11,457' TVD: 7,511.32' Inclination: 90.95° Azimuth: 358.12°		MD: 11,551' TVD: 7,510.58' Inclination: 89.96° Azimuth: 356.9°		MD: 11,660' TVD: 7,510.58' Inclination: 89.96° Azimuth: 356.9°	
11420-11480 75% CHK: pred lt gy-gy, rr dk gy, v arg	11480-11540 75% CHK: gy-lt gy, rr dk gy wi wh chk	11540-11600 70% CHK: pred lt gy-gy, rr dk gy, v arg	11600-11660 70% CHK: lt gy-gy, rr	11660-11720 70% CHK: lt gy-gy, rr	11720-11780 70% CHK: lt gy-gy, rr
LS, mod fis med frm-frm sb rd-sb ply-sb blkly cigs, rr f	incl, mod fis v arg LS, med frm-frm sb rd-sb ply-sb	LS, mod fis med frm-frm sb rd-sb ply-sb blkly cigs, rr f	frm-frm sb rd-sb ply-sb blkly cigs, v	frm-frm sb rd-sb ply-sb blkly cigs, v	frm-frm sb rd-sb ply-sb blkly cigs, v
wh chk incl & thn elong lamm, tr bent, mod-hi calc	blkly cigs, rr f wh chk incl & thn elong lamm, mod-hi	wh chk incl & thn elong lamm, tr bent, tr fos frags,	mod-hi calc, MRLST (30%): pred dk gy, occ gy, l fis sb	mod-hi calc, MRLST (30%): pred dk gy, occ gy, l fis sb	mod-hi calc, MRLST (30%): pred dk gy, occ gy, l fis sb
MRLST (25%): pred dk gy, occ gy, l fis sb rd med	calc MRLST (25%): pred dk gy, occ gy, l fis sb rd med	rd med frm-frm cigs, occ brn incl, rr vf pyr & pyr strg,	rd med frm-frm cigs, occ brn incl, rr vf pyr & pyr strg,	rd med frm-frm cigs, occ brn incl, rr vf pyr & pyr strg,	rd med frm-frm cigs, occ brn incl, rr vf pyr & pyr strg,
frm-frm cigs, occ brn incl, rr vf pyr & pyr strg, brn mod	frm-frm cigs, occ brn incl, rr vf pyr & pyr strg, brn mod	frm-frm cigs, occ brn incl, rr vf pyr & pyr strg,	frm-frm cigs, occ brn incl, rr vf pyr & pyr strg,	frm-frm cigs, occ brn incl, rr vf pyr & pyr strg,	frm-frm cigs, occ brn incl, rr vf pyr & pyr strg,
calc	calc	brn mod calc	brn mod calc	brn mod calc	brn mod calc
	7900		7900		7900





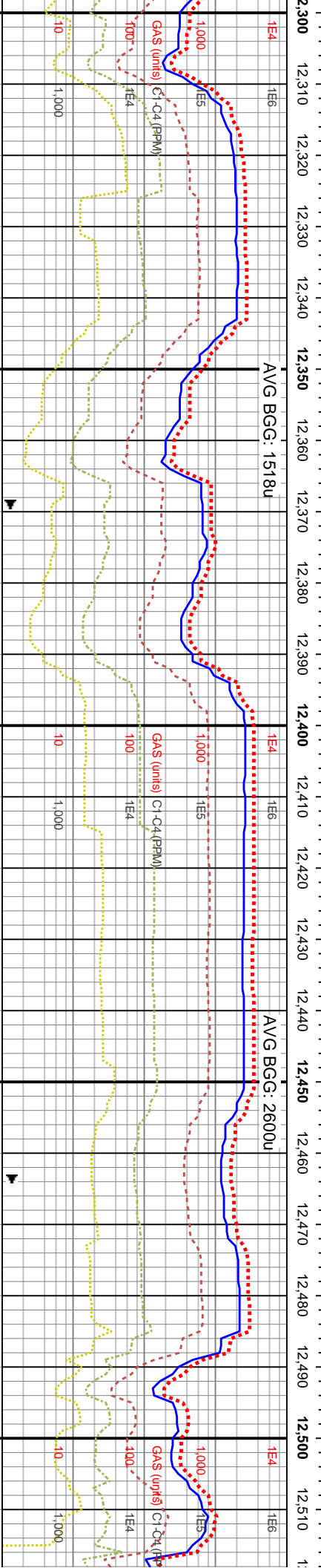
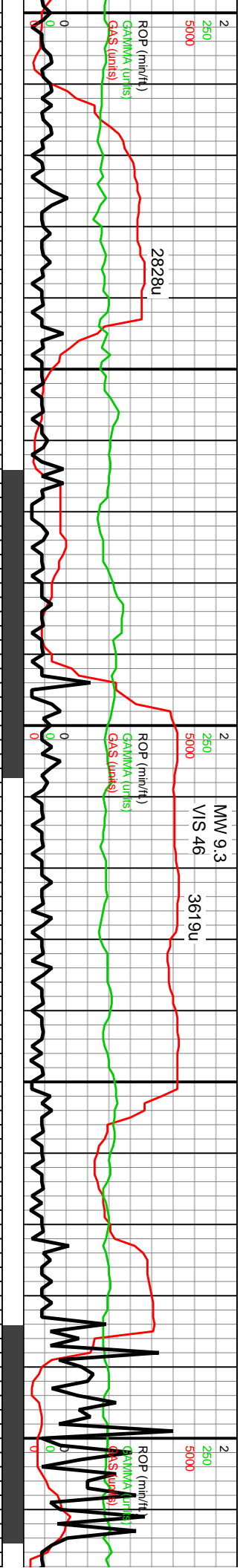
11900-11960 80% CHK: lt gy-gy, med frm-frm, mod fis sb rd-sb ply-sb blkly med frm-frm ctgs, v arg LS wi com f wh chk incl & abnt thn elong chky lamn, tr bent, tr pyr, mod-hi calc, wi inbdd MRLST (20%): pred dk gy, occ gy, l fis med frm-frm sb rd ctgs, occ brn incl, rr vf pyx, mod brn calc	11960-12020 85% CHK: lt gy-gy, mod fis sb rd-sb ply-sb blkly med frm-frm ctgs, v arg LS wi com f wh chk incl & abnt thn elong chky lamn, tr bent, tr pyr, mod-hi calc, MRLST (15%): pred dk gy, occ gy, l fis sb rd med frm-frm ctgs, occ brn incl, rr vf pyx, mod calc	12020-12080 90% CHK: lt gy-gy, v arg ls wi abnt chky lamn & occ f chk incl, mod fis sb rd-sb ply-sb blkly med frm-frm ctgs, tr vf pyr, mod-hi calc, MRLST (10%): dk gy, l fis, sb rd-sb blkly med frm-frm ctgs, occ brn incl, rr vf pyr, mod calc
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12020-12140 90% CHK: lt gy-gy, v arg ls wi abnt chky lamm & occ f chk incl, mod fis sb rd-sb ply-sb blkly med frm-frm ctgs, tr vf pyr, mod-hi calc, MRLST (10%): dk gy, l fis, sb rd-sb blkly med frm-frm ctgs, occ brn incl, tr vf pyr, mod calc	12140-12200 90% CHK: lt gy-gy, mod fis v arg ls wi abnt chky lamm & occ f chk incl, sb rd-sb ply-sb blkly med frm-frm ctgs, tr vf pyr, mod-hi calc, MRLST (10%): dk gy, l fis, sb rd-sb blkly med frm-frm ctgs, occ brn incl, tr vf pyr, mod calc	12200-12260 90% CHK: lt gy-gy wi abnt chky lamm & occ f chk incl, med frm-frm mod fis arg LS, sb rd-sb ply-sb blkly med frm-frm ctgs, tr vf pyr & pyr strg, mod-hi calc, MRLST (10%): dk gy, l fis, sb rd-sb blkly med frm-frm ctgs, occ brn incl, tr vf pyr, mod calc	12260-12320 90% CHK: lt gy-gy wi occ f chk incl, med frm-frm mod fis a ply-sb blkly med frm-frm ctgs, tr vf p calc, MRLST (10%): dk gy, l fis, sb r frm-frm ctgs, occ brn incl, tr vf pyr, tr
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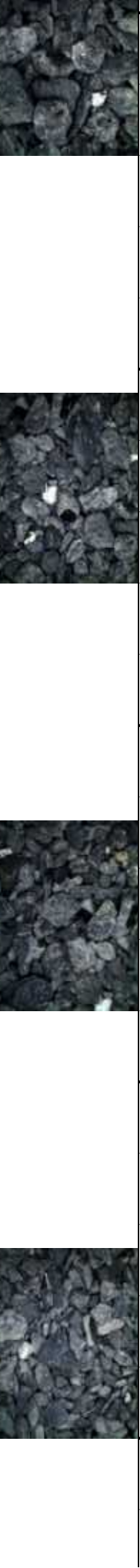
WOB: 65Klbs
Rotary: 0RPM
Strokes: 200SPM
Pump Rate: 613GPM

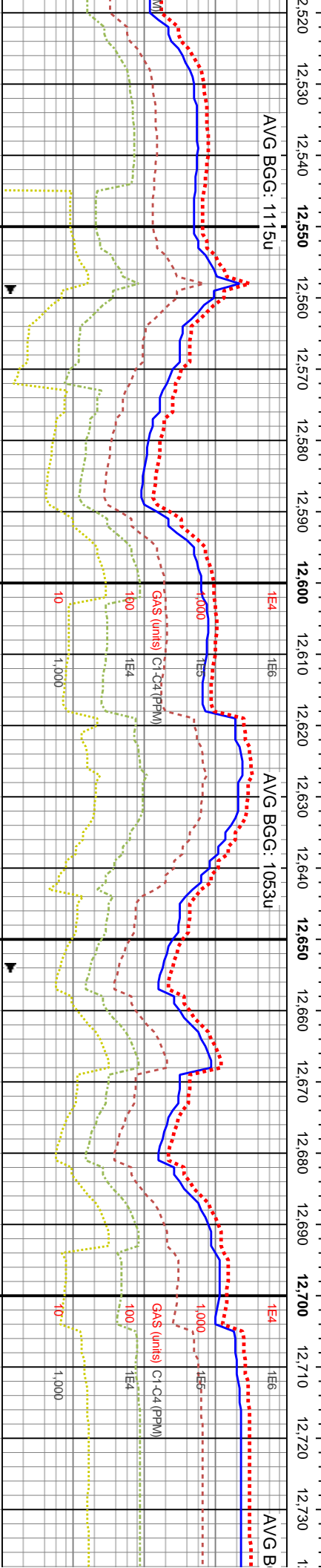
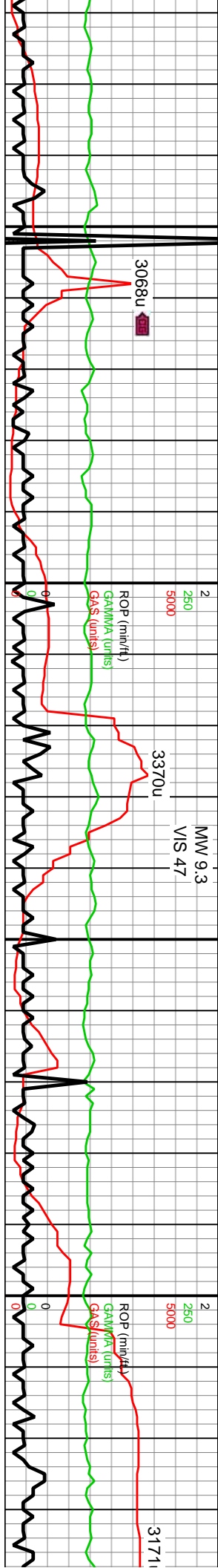
MD: 12,310'
TVD: 7,499.47'
Inclination: 91.72°
Azimuth: 359.96°
VS: 4,475.73'

MD: 12,405'
TVD: 7,497.51'
Inclination: 90.64°
Azimuth: 2.49°
VS: 4,570.41'

MD: 12,500'
TVD: 7,497.06'
Inclination: 89.9°
Azimuth: 0.69°
VS: 4,665.14'

abnt chky lamm & arg LS, sb rd-sb	12320-12380 90% CHK: lt gy-gy, v arg ls wi abnt chky lamm & occ f chk incl, mod fis sb rd-sb pily-sb blyky	12380-12440 90% CHK: lt gy-gy wi abnt chky lamm & occ f chk incl, med frm-frm mod fis arg LS, sb rd-sb pily-sb blyky med frm-frm mod fis arg LS, sb rd-sb f chk incl, med frm-frm mod fis arg LS, sb rd-sb pily-sb blyky med frm-frm mod fis arg LS, sb rd-sb frags, mod-hi calc	12440-124500 CHK: lt gy-gy wi abnt chky lamm & occ f chk incl, med frm-frm mod fis arg LS, sb rd-sb pily-sb blyky med frm-frm mod fis arg LS, sb rd-sb frags, mod-hi calc	12500-12560 Chk incl, med frm blyky med frm-frm mod-hi calc
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WOB: 36klbs
Rotary: 65RPM
Strokes: 200SPM
Pump Rate: 612GPM

MD: 12,595'
TVD: 7,497.82'
Inclination: 89.19°
Azimuth: 358.02°
VS: 4,759.52'

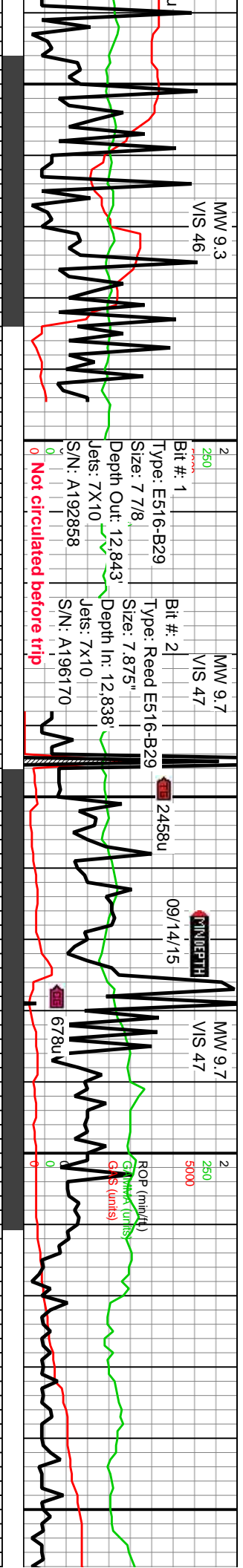
MD: 12,690'
TVD: 7,500.28'
Inclination: 87.84°
Azimuth: 355.61°
VS: 4,853.31'

12560-12620 CHK: lt gy-gy, v arg ls w/ abnt chky lamm & occ f chk incl, mod fis sb rd-sb ply-sb blkly med frm-frm ctgs, tr vf pyr & pyr strg, tr fos frags, mod-hi calc

12620-12680 CHK: lt gy-gy, abnt chky lamm & occ f chk incl, med frm-frm mod fis arg LS, sb rd-sb ply-sb blkly med frm-frm ctgs, tr vf pyr & pyr strg, tr fos frags, mod-hi calc

12680-12740 90% CHK: lt gy-gy w/ abnt chky lamm & occ f chk incl, mod fis sb rd-sb ply-sb blkly med frm-frm arg LS ctgs, tr vf pyr & pyr strg, rr-occ fos frags, mod-hi calc, MRLST (10%): dk gy, sb rd-sb blkly med frm-frm fis ctgs, occ brn incl, rr vf pyr, mod brn calc





WOB: 39Klbs
Rotary: 60RPM
Strokes: 200SPM
Pump Rate: 612GPM

MD: 12,784'
TVD: 7,503.93'
Inclination: 87.71°
Azimuth: 355.68°

Not circulated before trip

TVD (ft)

SP @ 12,838'

Note: TOH for bit and motor

MD: 12,905'
TVD: 7,502.45'
Inclination: 93.69°
Azimuth: 358.52°

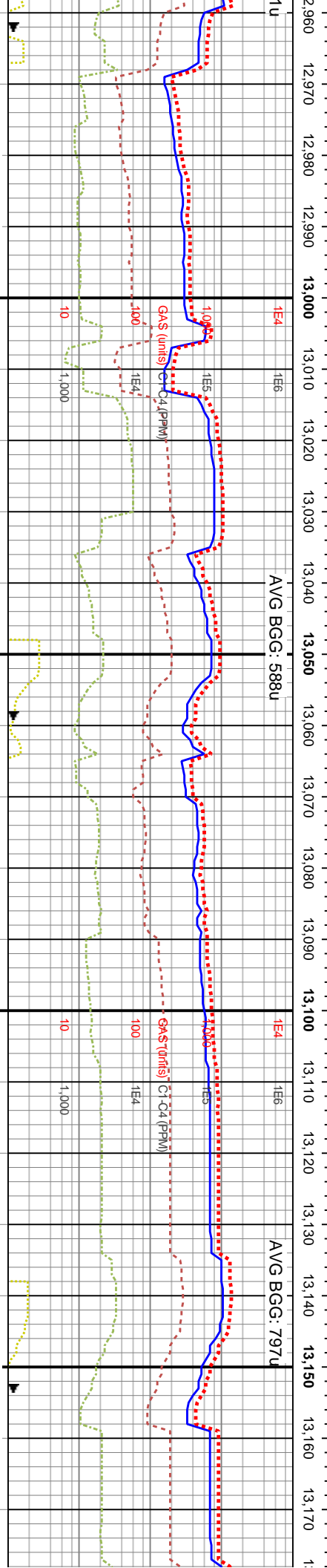
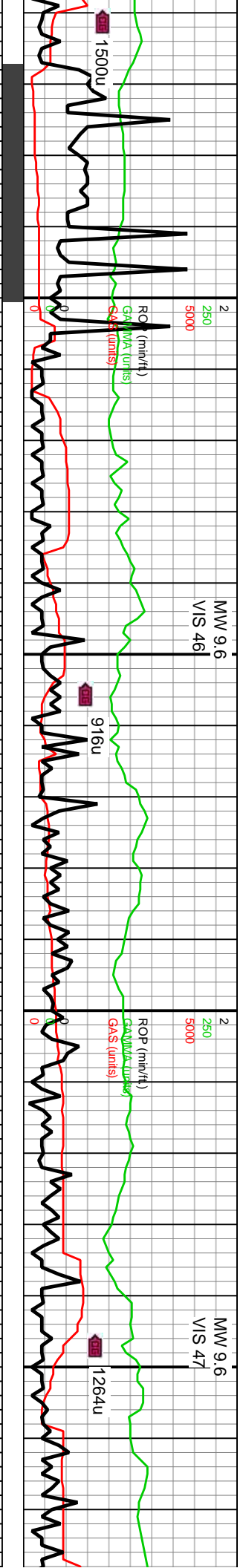
12740-12800 90% CHK: lt gy-gy, mod fis med
frm-frm v arg LS ctgs, rr-occ los frags, com c chk
lamn & occ chk incl, occ c free chk, tr vf pyr & pyr strg,
mod-hi calc, MRLST (10%): dk gy, sb rd-sb blkly med
frm-frm fis ctgs, occ brn incl, rr vf pyr, mod brn calc

12840-12860 CHK (80%): lt-med gy-brnshgy, mod fis,
frm-brt, sb blkly-blky, rr f wh chk incl & thn lamn, occ c
free chk, hi calc, tr vf pyr & pyrc nod; MRLST (20%):
med-dk gy, fis, sb blkly, mod frm-brt, occ brn incl

12860-12920 CHK (70%): predy lt gy, mod fis, frm-sl
brit, sb blkly-sb ply, occ f wh chk incl & thn lamn, occ c
free chk, hi calc, tr vf pyr; MRLST (30%): med-dk gy,
fis, sb blkly, mod frm-brt, occ brn incl 7900

12920-12980 CHK (80%): predy lt g
mod fis, frm-sl brit, sb blkly-sb ply, c
thn lamn, occ c free chk, hi calc, tr v
(20%): dk gy, fis, sb blkly-sb md, mc
incl





WOB: 34Klbs
Rotary: 70RPM
Strokes: 180SPM
Pump Rate: 549GPM

MD: 13,000'
TVD: 7,497.59'
Inclination: 92.18°
Azimuth: 1.91°

MD: 13,095'
TVD: 7,494.12'
Inclination: 92°
Azimuth: 2.1°

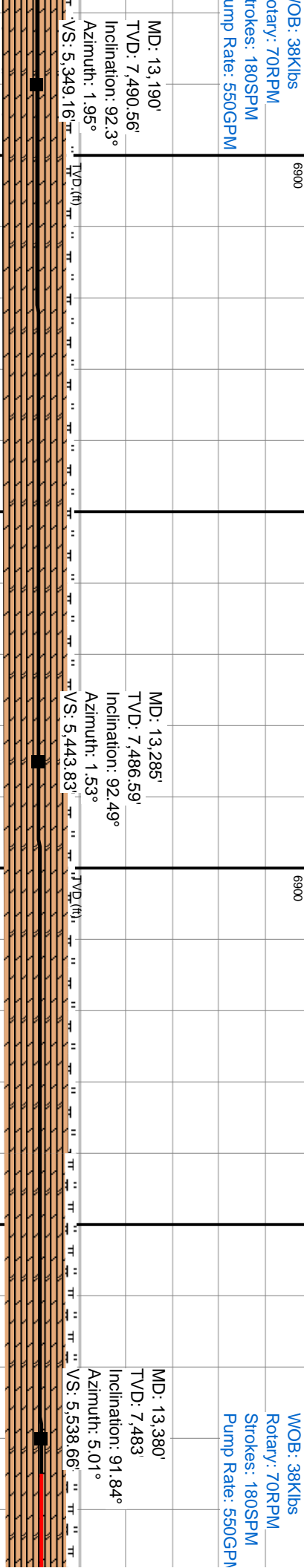
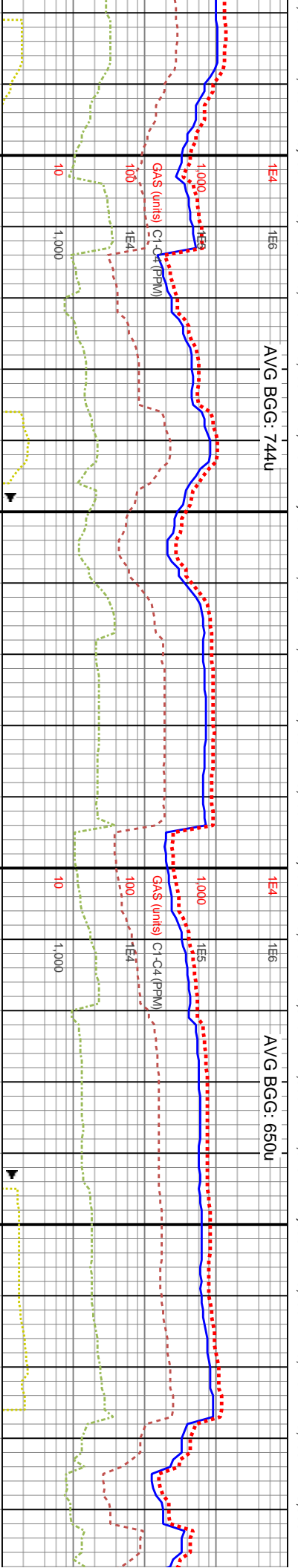
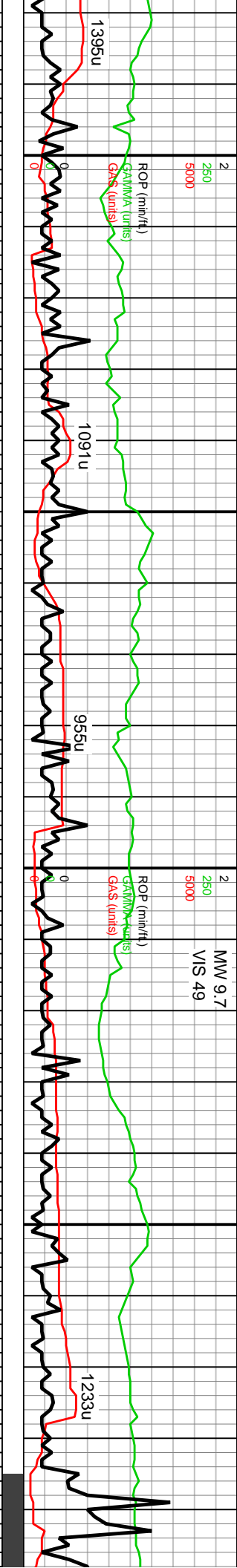
12980-13040 CHK (80%): predy lt gy, occly med gy,
mod fis, frm-sl brit, sb blkly-sb pty, occ f wh chk incl &
thn lamn, occ c free chk, hi calc, tr vf pyr; MRLST
(20%): med-dk gy, fis, sb blkly-sb mdl, mod frm-brit, occ brn incl

13040-13100 CHK (70%): predy lt gy, occly med gy,
mod fis, frm-sl brit, sb blkly, occ f wh chk incl & thn
lamn, occ c free chk, hi calc, tr vf pyr; MRLST (30%): dk
gy, fis, sb blkly, mod frm-brit, occ brn incl

13100-13160 CHK (70%): predy lt gy, occly med gy,
mod fis, frm-sl brit, sb blkly, occ f wh chk incl & thn
lamn, occ c free chk, hi calc, tr vf pyr & lse pyrc nod;
MRLST (30%): dk gy, fis, sb blkly, mod frm-brit, occ brn
incl

13160-13220 90
occ f chk incl, mu
frm-frm arg LS c
MRLST (10%): c
ctgs, occ brn inc



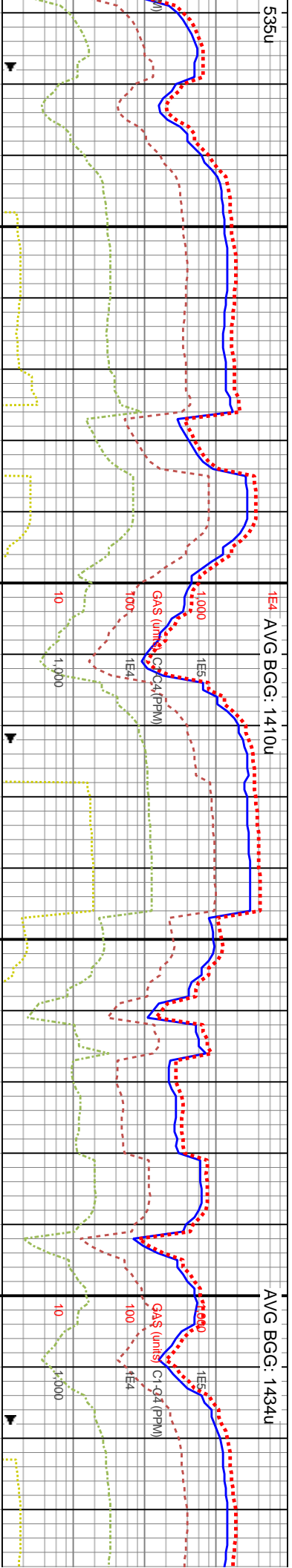
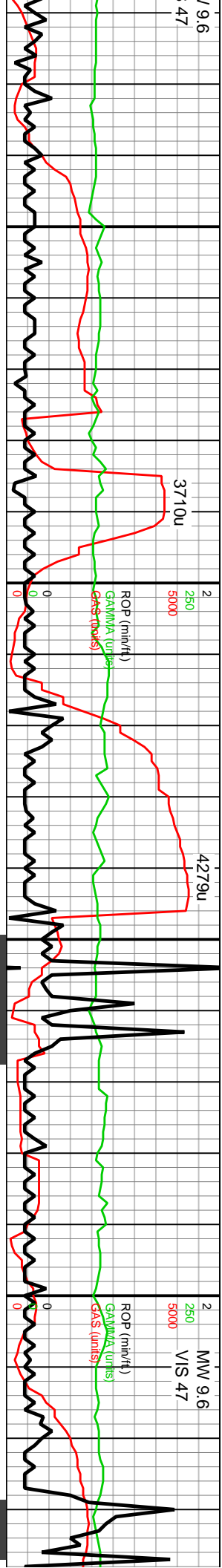


MD: 13,190'
TVD: 7,490.56'
Inclination: 92.3°
Azimuth: 1.95°
VS: 5,349.16'

MD: 13,285'
TVD: 7,486.59'
Inclination: 92.49°
Azimuth: 1.53°
VS: 5,443.83'

MD: 13,380'
TVD: 7,483'
Inclination: 91.84°
Azimuth: 5.01°
VS: 5,538.66'



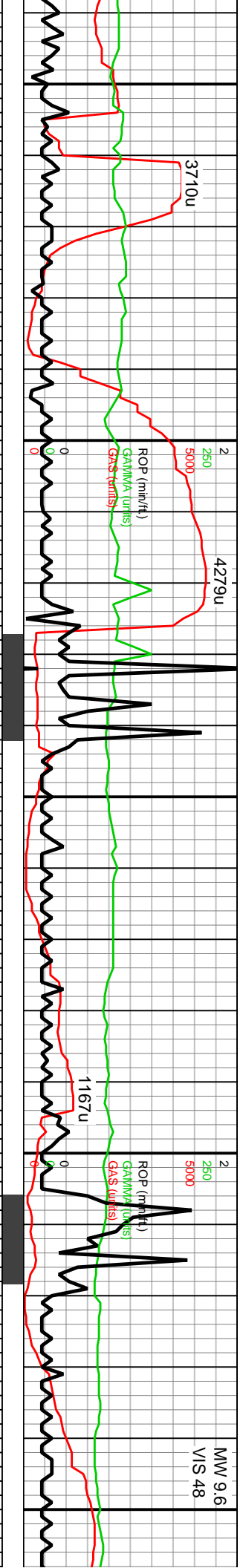


MD: 13,664'
TVD: 7,480.95'
Inclination: 88.73°
Azimuth: 4.63°

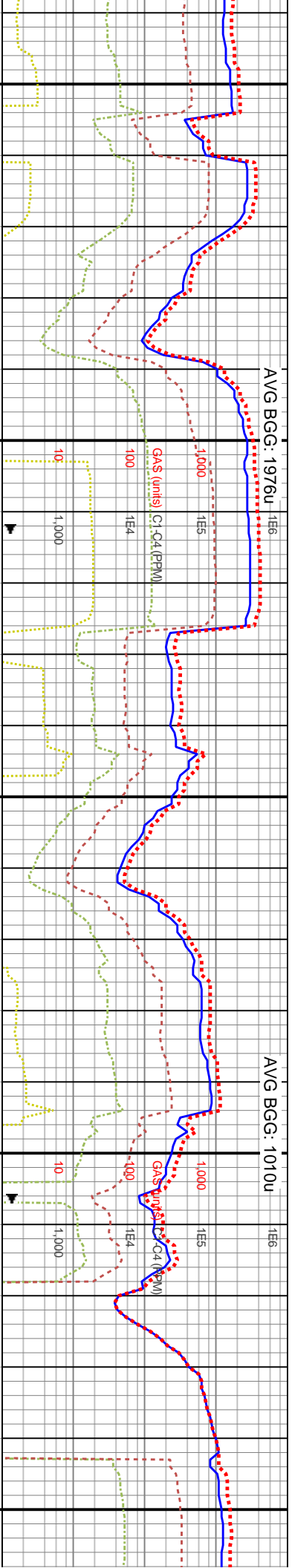
MD: 13,759'
TVD: 7,482.21'
Inclination: 89.75°
Azimuth: 3.44°

WOB: 41Klbs
Rotary: 70RPM
Strokes: 180SPM
Pump Rate: 550GPM

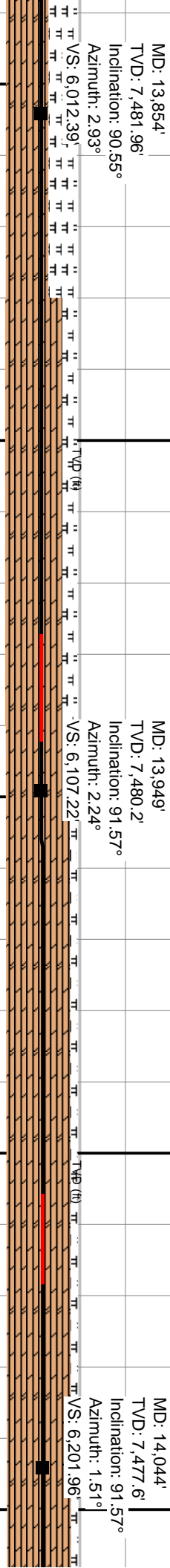
[illegible]



13,840 13,850 13,860 13,870 13,880 13,890 13,900 13,910 13,920 13,930 13,940 13,950 13,960 13,970 13,980 13,990 14,000 14,010 14,020 14,030 14,040 14,050 1-



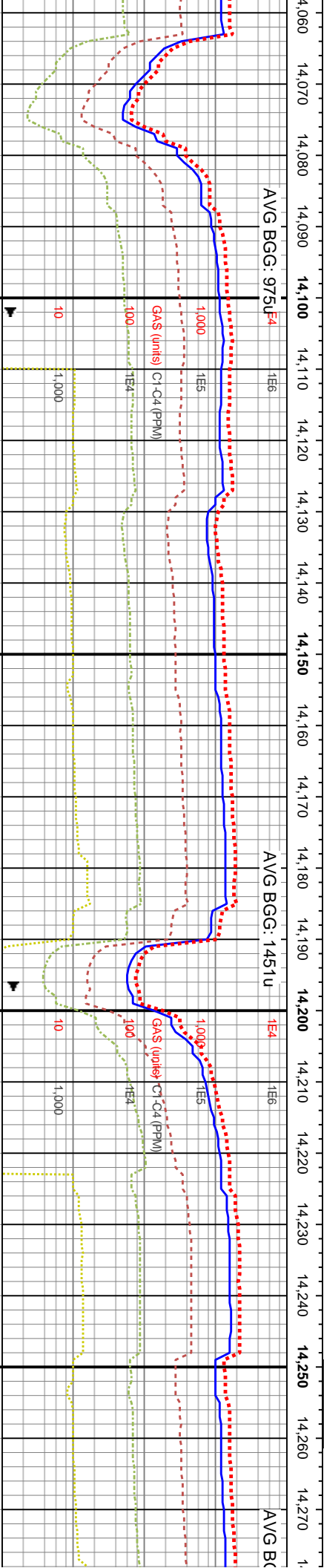
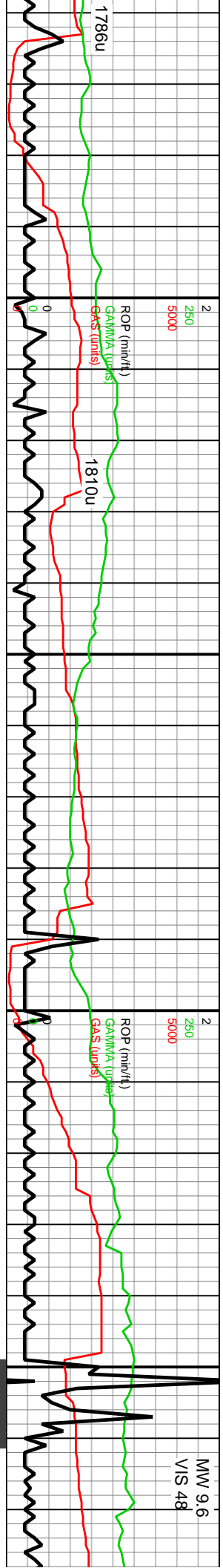
MD: 13,854'
TVD: 7,481.96'
Inclination: 90.55°
Azimuth: 2.93°



MD: 13,949'
TVD: 7,480.2'
Inclination: 91.57°
Azimuth: 2.24°

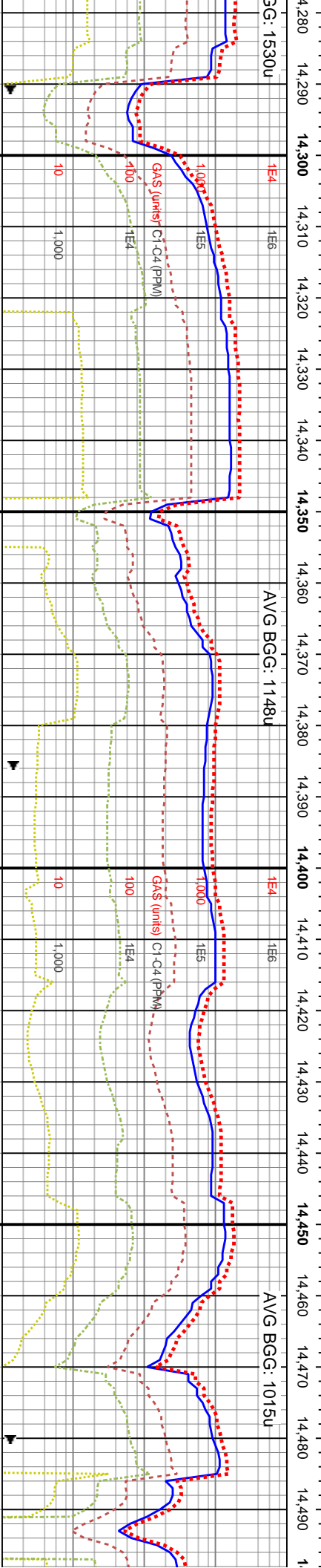
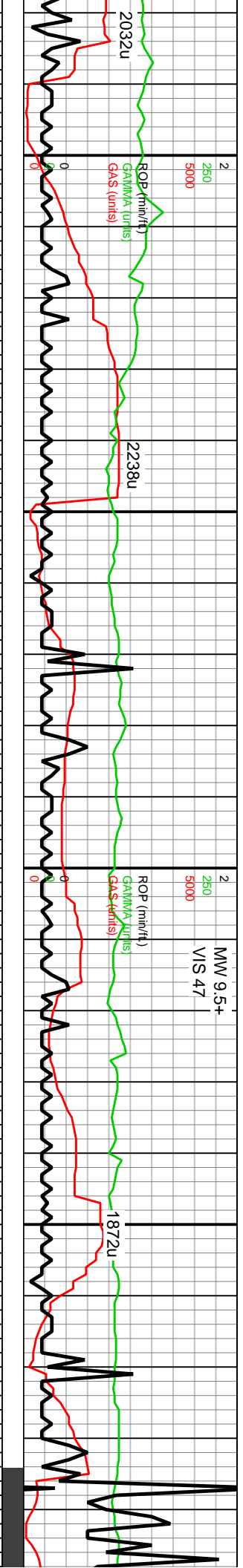


MD: 14,044'
TVD: 7,477.6'
Inclination: 91.57°
Azimuth: 1.51°



14060-14120 CHK (90%): pred lt gy-gy, occ dk gy wi brn mrl & wh chky incl, l-mod fis med frm-firm ctgs, occ f chk incl & com thn chk lamm, rr c free chk, tr vf pyr, mod-hi calc, wi occ MRLST (10%): dk gy, l fis sb rd-sb blkly med frm-firm ctgs, occ brn incl, rr wh chk incl intbds, rr vf pyr, mod brn calc	14120-14180 90% CHK: pred lt gy, occ gy, med frm-firm l-mod fis ctgs, occ f chk incl & com thn chk lamm, rr c free chk, tr vf pyr, mod-hi calc, wi 10% MRLST: dk gy, l-mod fis sb rd-sb blkly med frm-firm ctgs, rr vf pyr, occ brn mrl incl & wh chk incl, mod brn calc	14180-14240 80% CHK: pred lt gy-gy, occ dk gy, l-mod fis med frm-firm ctgs, occ f chk incl & com thn chk lamm, rr c free chk, tr vf pyr, mod-hi calc, wi com intbdd MRLST (20%): dk gy, l fis sb rd-sb blkly med frm-firm ctgs, occ brn incl, rr wh chk incl intbds, rr vf pyr, mod brn calc	14240-14300 70% CHK: pred lt gy-gy, l-mod fis med frm-firm ctgs, occ f chk incl & com thn chk lamm, rr c free chk, tr vf pyr, mod-hi calc, wi com intbdd MRLST (30%): dk gy, l fis sb rd-sb blkly med frm-firm ctgs, com brn mrlly incl intbds, rr vf pyr, mod brn calc
7900	7900	7900	7900





MD: 14.328'
TVD: 7,474.08'
Inclination: 89.41°
Azimuth: 0.33°

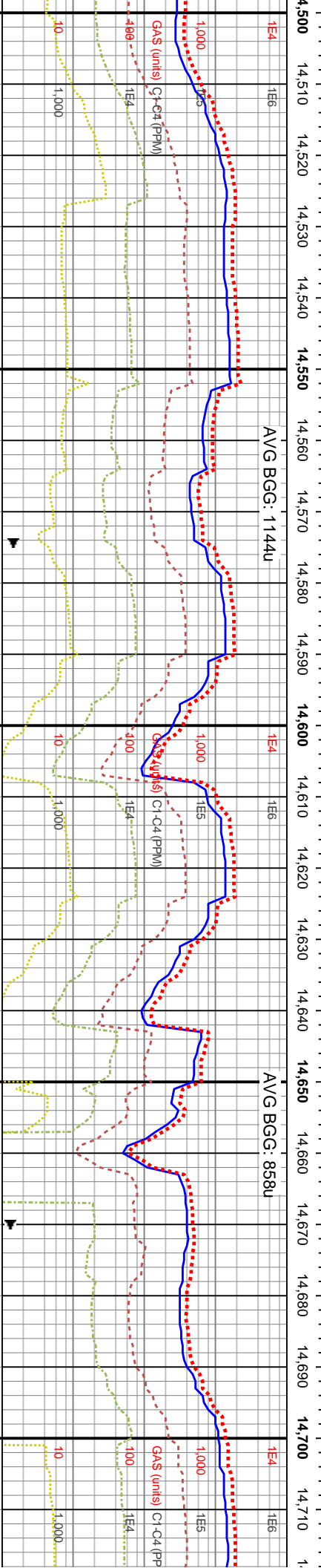
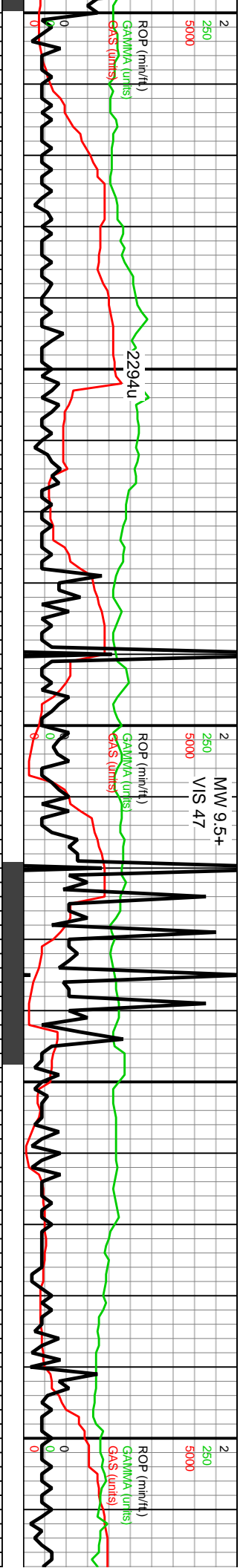
MD: 14.422'
TVD: 7,474.47'
Inclination: 90.12°
Azimuth: 0.32°

14300-14420 70% CHK: lt gy-gy, occ dk gy, l-mod fis med frm-firm ctgs, occ f chk incl & com thn chk lamn
intbddd wi occ mrlst, tr c free chk, tr vf pyr, mod-hi calc, grdg to intbddd MRLST (30%): dk gy, l fis sb rd-sb blkly
med frm-firm ctgs, com brn mrlly incl intbddd wi wh chk incl, tr vf pyr, mod brn calc

14420-14480 90% CHK: pred lt gy-gy, occ dk gy, l-mod fis med frm-firm ctgs wi occ f chk incl & com thn
chk lamn/elong incl, tr c free chk, tr vf pyr, mod-hi calc, wi occ MRLST (10%): dk gy, l fis sb rd-sb blkly med
frm-firm ctgs, com brn mrlly incl intbddd wi wh chk incl ip, tr vf pyr, mod brn calc

14480-14540 90% CHK: pred lt gy-gy, occ dk gy, l-mod fis med frm-firm ctgs wi occ f chk incl & com thn
chk lamn/elong incl, tr c free chk, tr vf pyr, mod-hi calc, wi occ MRLST (10%): dk gy, l fis sb rd-sb blkly med
frm-firm ctgs, com brn mrlly incl intbddd wi wh chk incl ip, tr vf pyr, mod brn calc

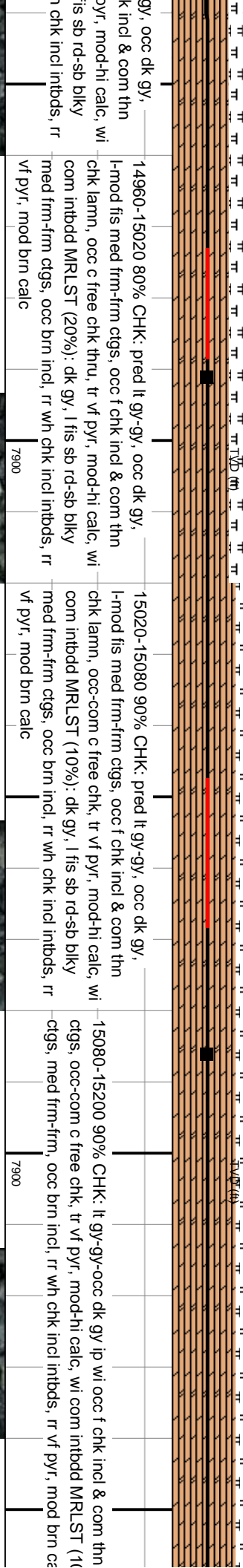
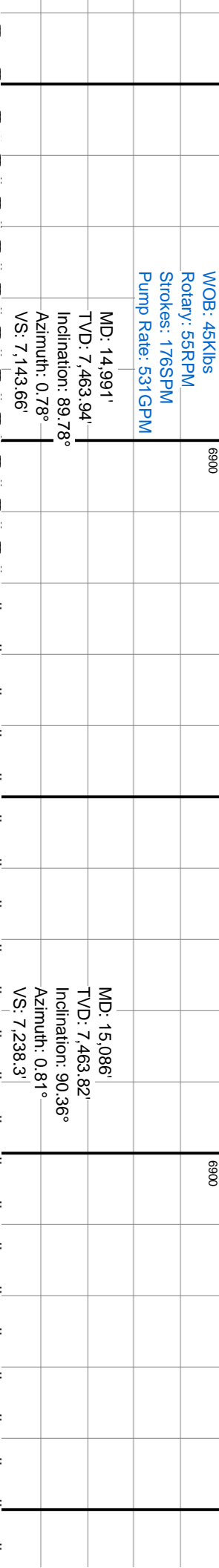
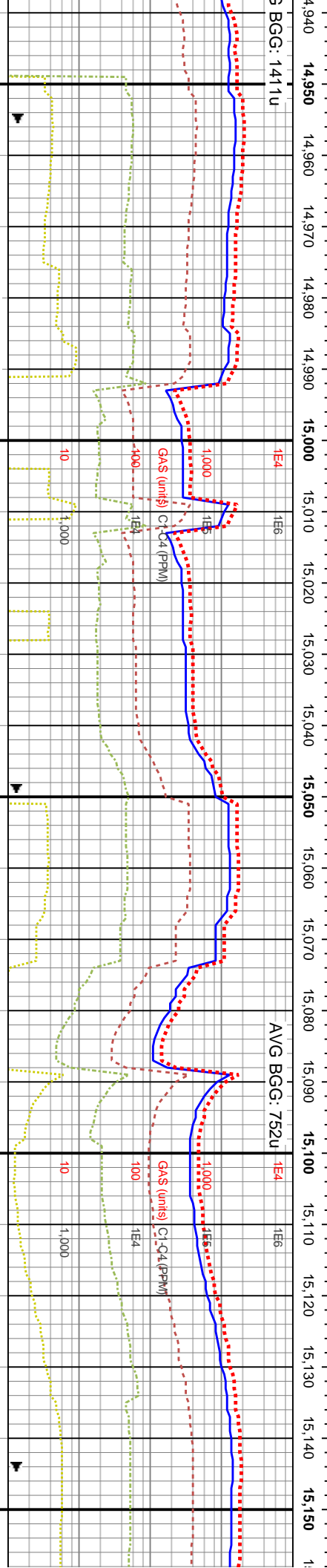
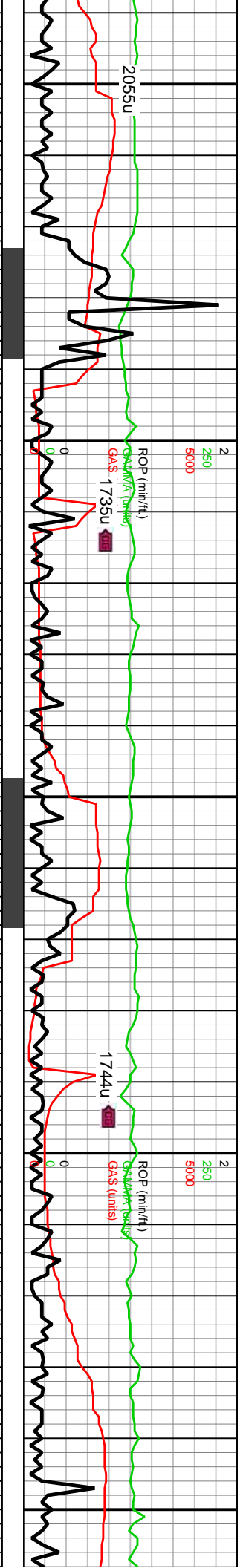


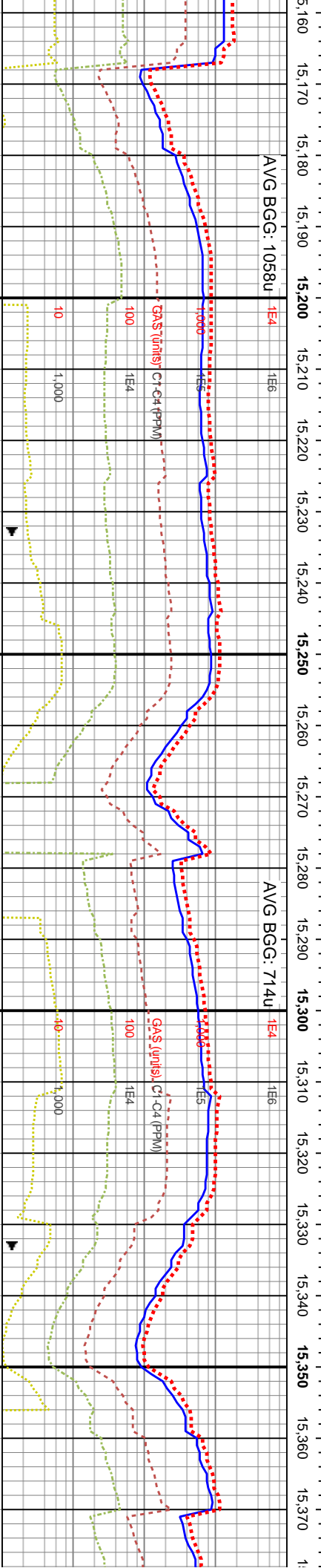
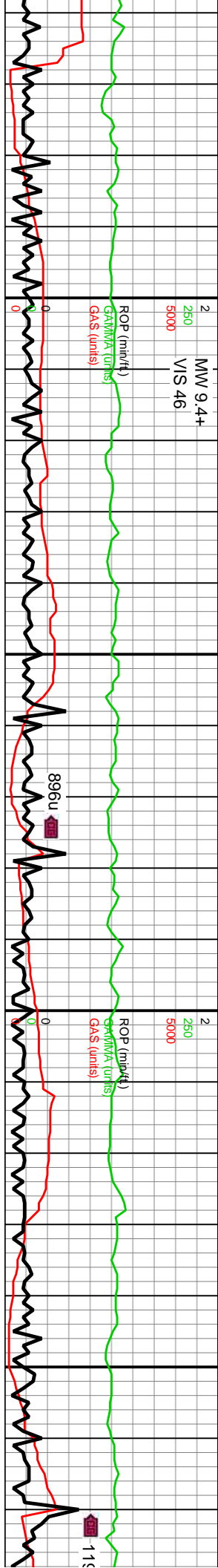


6900	MD: 14.517' TVD: 7,475.04' Inclination: 89.19° Azimuth: 359.14° VS: 6,672.87'	WOB: 78Klbs Rotary: 0RPM Strokes: 174SPM Pump Rate: 531GPM	6900	MD: 14.612' TVD: 7,474.05' Inclination: 92° Azimuth: 358.66° VS: 6,767.17'	6900	MD: 14.707' TVD: 7,470.41' Inclination: 92.4° Azimuth: 357.95° VS: 6,861.28'
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14540-14600 90% CHK: lt gy-gy, occ dk gy wi occ wh chky incl, l-mod fis med frm-frm ctgs, occ thn chk lamn, tr c free chk, tr vf pyr, mod-hi calc, wi com intbdd MRLST (10%): dk gy, l fis sb rd-sb blkly med frm-frm ctgs, occ brn incl, rr wh chk incl intbds, rr vf pyr, mod brn calc	14600-14660 CHK: lt gy-gy, occ dk gy wi occ wh chky incl, occ brn mly incl ip, l-mod fis med frm-frm ctgs, occ thn chk lamn, tr c free chk, tr vf pyr, mod-hi calc	14660-14720 CHK: lt gy-gy, occ dk gy, l-mod fis sb rd-sb blkly-ply ctgs, med frm-frm ctgs, com wh f chky incl & thn lamn, rr brn mly incl ip, tr c free chk, tr vf pyr, mod-hi calc
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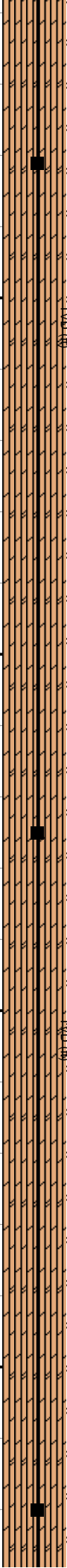


WOB: 48Klbs
Rotary: 74RPM
Strokes: 172SPM
Pump Rate: 527GPM

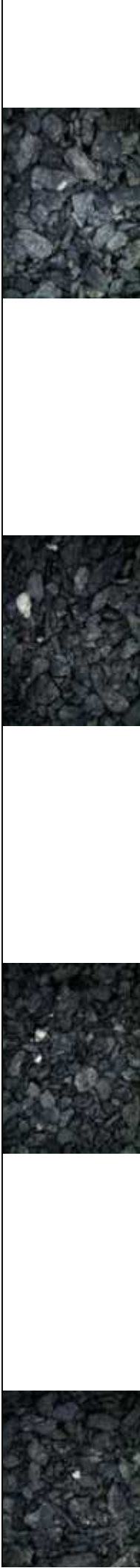
MD: 15,181'
TVD: 7,463.4'
Inclination: 90.15°
Azimuth: 0.73°
VS: 7,332.93'

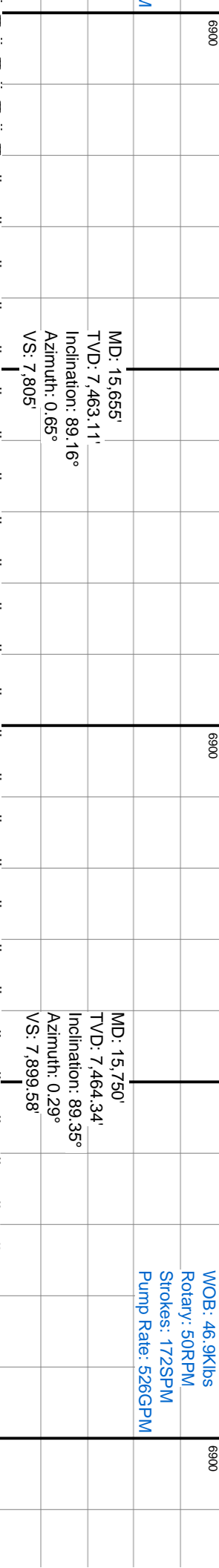
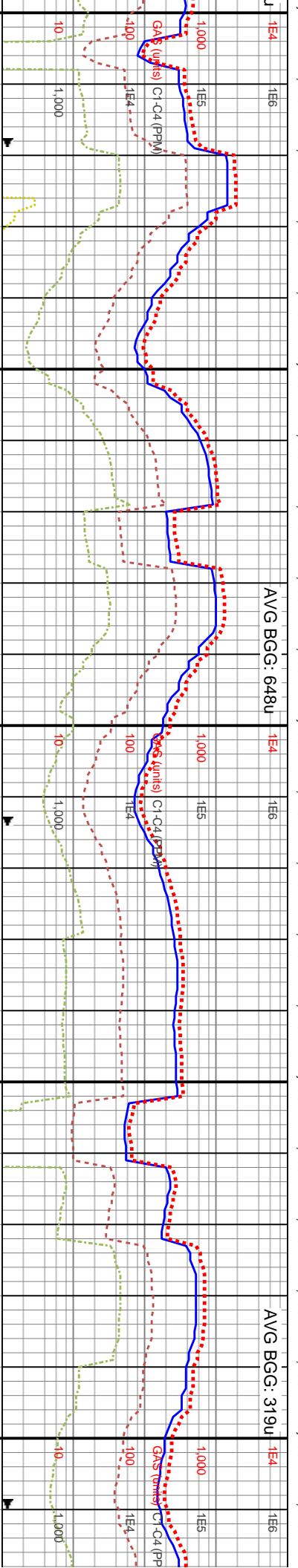
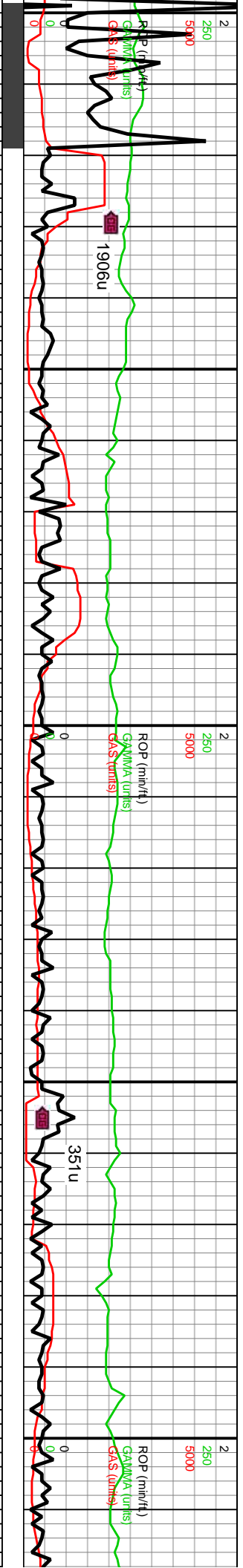
MD: 15,275'
TVD: 7,463.31'
Inclination: 89.96°
Azimuth: 0.98°
VS: 7,426.58'

MD: 15,370'
TVD: 7,463.37'
Inclination: 89.96°
Azimuth: 0.49°
VS: 7,521.21'



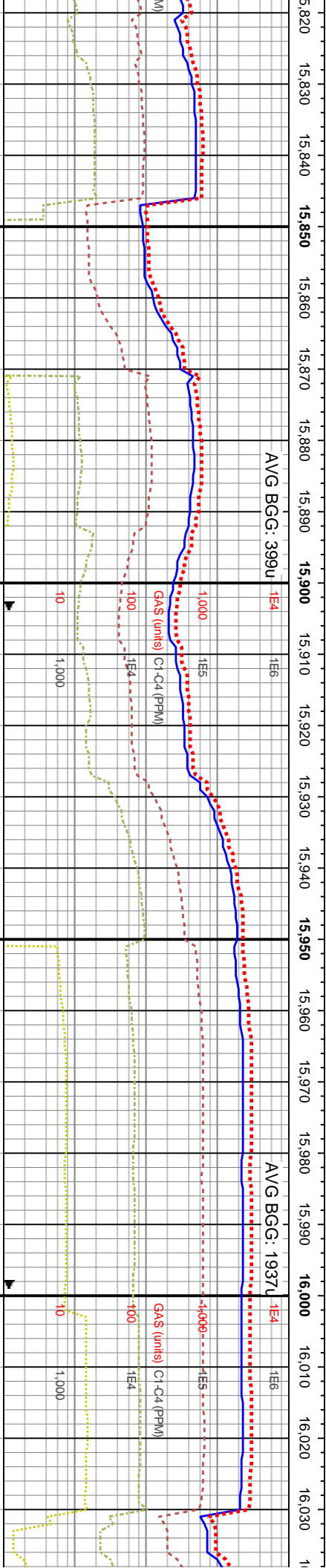
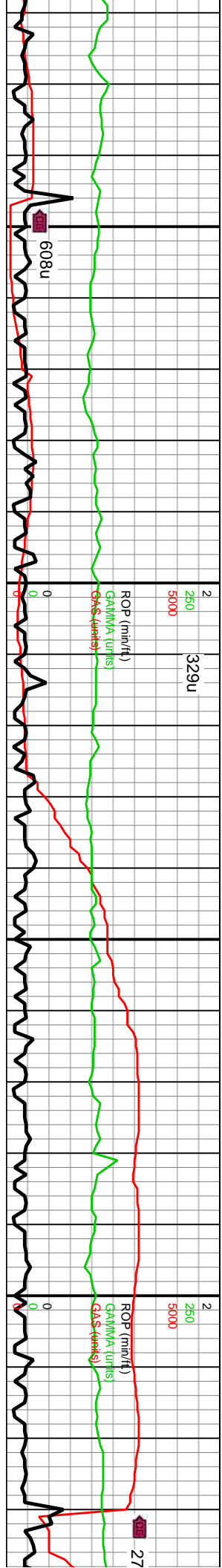
chk lamm, l-mod fis med frm-frm
15200-15320 90% CHK: lt gy-gy-occ dk gy ip wi occ f chk incl & com thn chk lamm,med
frm-frm pred mod fis sb blkly-sb ply cigs, occ l fis sb rd cigs, occ-com c free chk, tr vf pyr,
mod-hi calc, wi com intbdd MRLST (10%): dk gy, sb rd-sb blkly l-modfis cigs, med frm-frm,
occ brn incl, rr wh chk incl intbds, rr vf pyr, mod calc wi brn resd





15620-15680 CHK (90%): predy lt gy-gy, occ dk gy, com thn chk lamm, frm predy fis sb blkly-sb ply cigs, occ-com c free chk, tr vf pyr, mod-hi calc: MRLST (10%): dk gy, sb blkly, mod fis, mod frm, occ brn incl, rr vf pyr, mod calc wi brn resd	15680-15740 CHK (90%): lt gy-gy, com thn chk lamm, frm predy fis sb blkly-sb ply cigs, occ-com c free chk, tr vf pyr, mod-hi calc: MRLST (10%): dk gy, sb blkly mod fis cigs, mod frm, occ brn incl, rr vf pyr, mod calc wi brn resd	15740-15800 CHK (90%): lt gy-gy, com thn chk lamm, frm predy fis sb blkly-sb ply cigs, occ-com c free chk, tr vf pyr, mod-hi calc: MRLST (10%): dk gy, sb blkly l-mod fis cigs, mod frm, occ brn incl, rr vf pyr, occ pyrc nod, mod calc wi brn resd	15800-15860 Ch thn chk lamm, frm free chk, tr vf pyr blkly l-mod fis cig calc wi brn resd
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MD: 15,845'
TVD: 7,465.73'
Inclination: 88.98°
Azimuth: 359.19°
VS: 7,994.04'

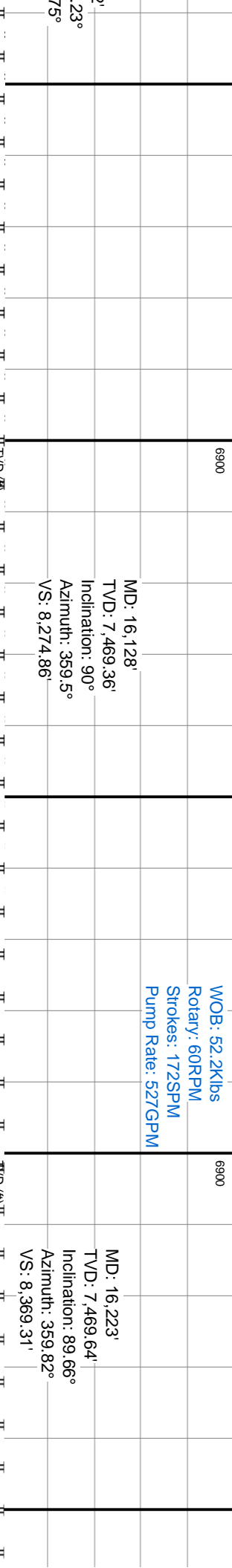
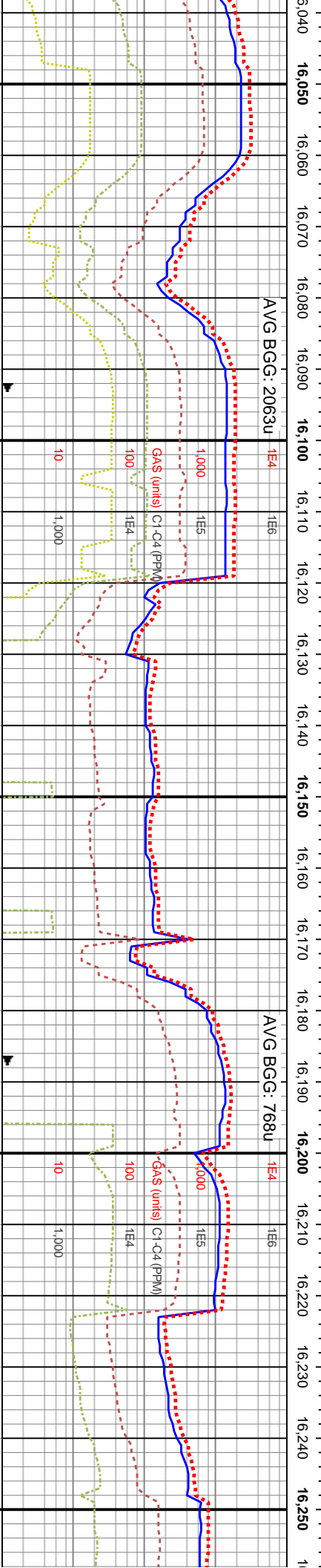
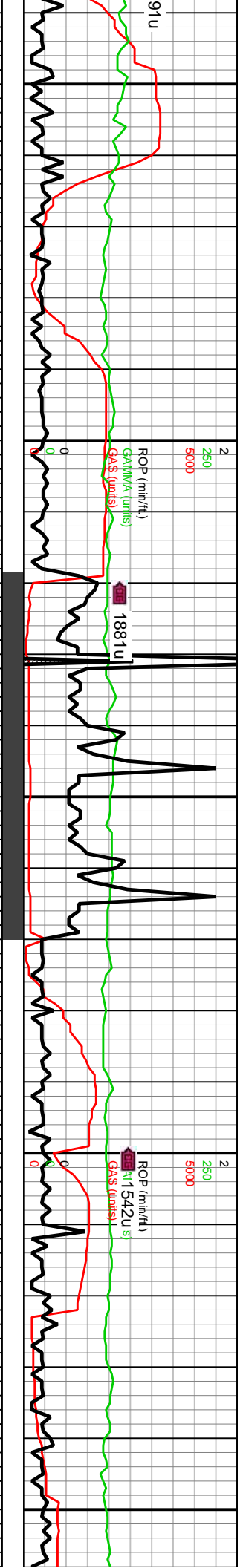
MD: 15,939'
TVD: 7,467.33'
Inclination: 89.07°
Azimuth: 359.17°
VS: 8,087.4'

WOB: 20.8klbs
Rotary: 50RPM
Strokes: 172SPM
Pump Rate: 527GPM

MD: 16,033'
TVD: 7,468.72'
Inclination: 89°
Azimuth: 357°
VS: 8,180.61'

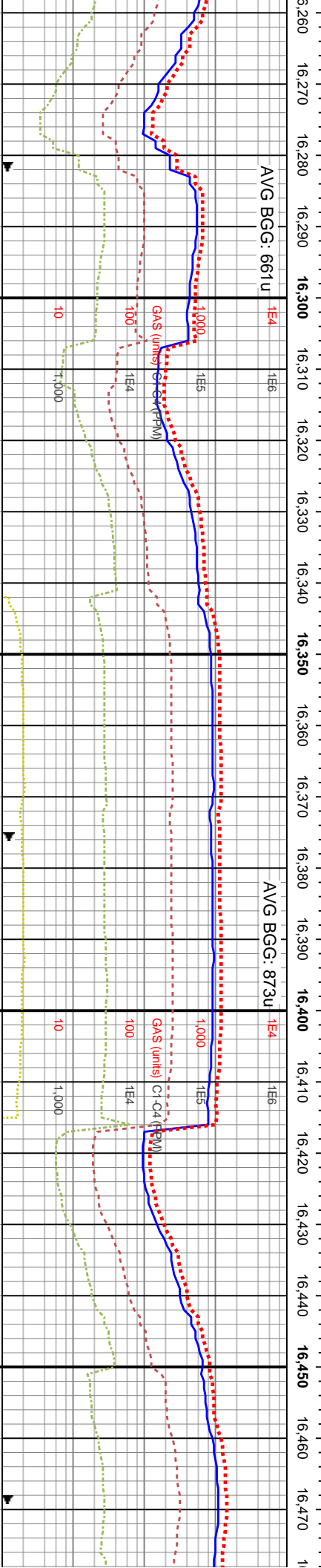
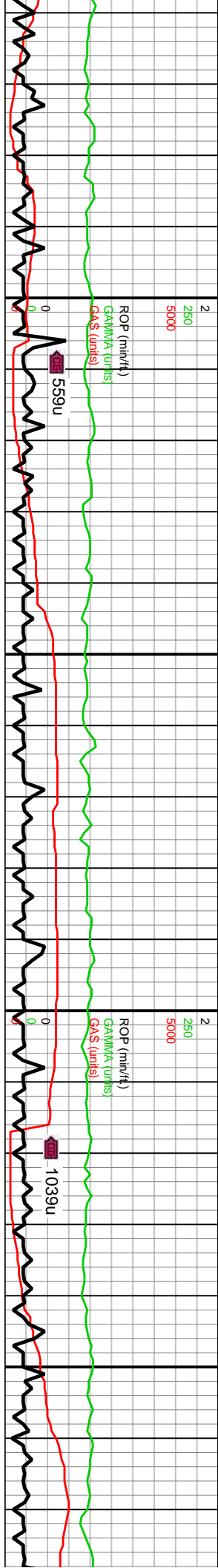
15860-15920 CHK (90%): predy lt gy, occ dk gy, com	15920-15980 CHK (90%): predy lt gy, occ dk gy, com	15980-16040 CHK (90%): predy lt gy, occ dk gy, com
thn chk lamm, frm predy fis sb blkys-sb plyt cigs, occ c	thn chk lamm, frm predy fis sb blkys cigs, occ-com c	thn chk lamm, frm predy fis sb blkys-sb plyt-occlv sb rd
free chk, tr vf pyr, mod-hi calc: MRLST (10%): dk gy, sb	free chk, tr vf pyr, mod-hi calc: MRLST (10%): dk gy, sb	cigs, occ-com c free chk, tr vf pyr, mod-hi calc: MRLST
blkyl-l-mod fis cigs, mod frm, occ brn incl, occ vf pyr, mod	blkyl-l-mod fis cigs, mod frm, occ brn incl, tr vf pyr, mod	(10%): dk gy, sb blkyl-l-mod fis cigs, mod frm, occ brn
mod calc wi brn resd	calc wi brn resd	incl, tr vf pyr, mod calc wi brn resd





16040-16100 CHK (90%): predy lt gy, occ dk gy, com	16100-16160 CHK (90%): predy lt-med gy, occly dk	16160-16220 CHK (90%): predy lt gy, occly dk gy, occ	16220-16280 CHK (90%): predy lt-t
thn chk lamm, frm predy fis sb blyk ctgs, occ-com c	gy, occ thn chk lamm, frm-sl brit predy fis sb blyk-sb	thn chk lamm, frm-sl brit predy fis sb blyk ctgs, occ c	gy, occ thn chk lamm, frm predy fis s
free chk, tr vf pyr, mod-hi calc: MRLST (10%): dk gy, sb	MRLST (10%): dk gy, sb blyk-sb ply l-mod fis ctgs,	free chk, tr vf pp pyr, hi calc: MRLST (10%): med-dk gy,	occ-com c free chk, tr vf pyr, mod-h-l
blyk l-mod fis ctgs, mod frm-sl brit, occ brn incl, rr vf	mod frm-sl brit, occ brn incl, rr vf pyr, mod calc wi brn	sb blyk-sb ply mod fis ctgs, mod frm-sl brit, occ brn	(10%): dk gy, sb blyk l-mod fis ctgs,
pyr, mod calc wi brn resd	resd	incl, mod calc wi brn resd	occ brn incl, rr vf pyr, mod calc wi b

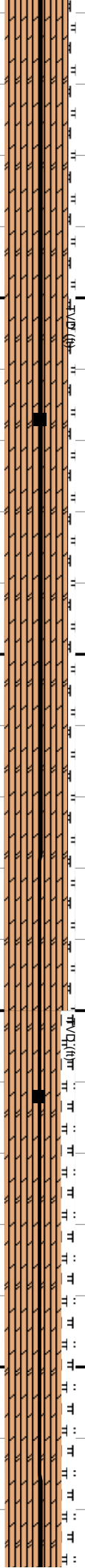




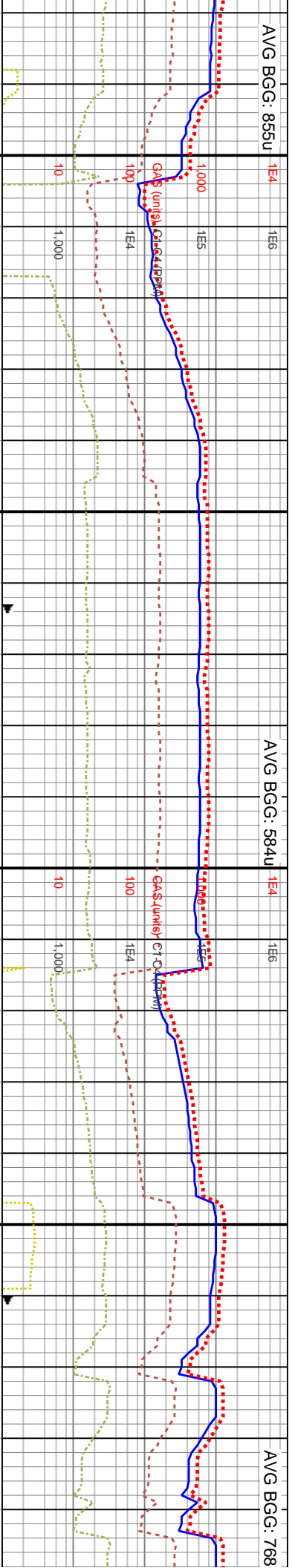
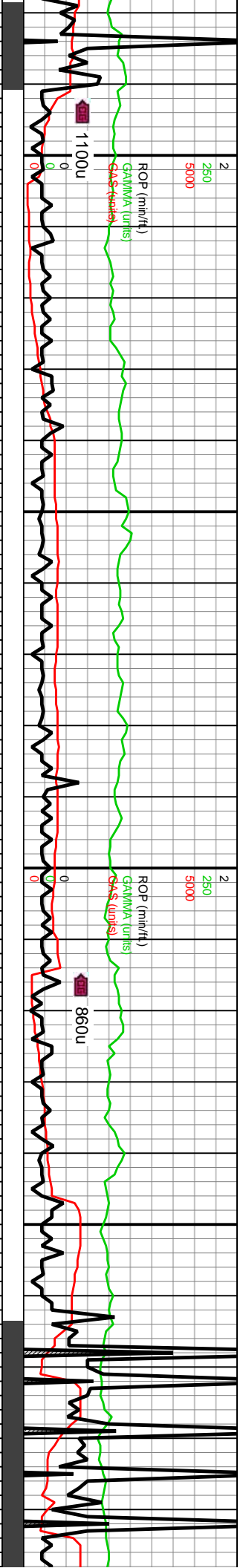
MD: 16,317'
TVD: 7,470.28'
Inclination: 89.56°
Azimuth: 0.01°
VS: 8,462.81'

WOB: 48.4Klbs
Rotary: 50RPM
Strokes: 172SPM
Pump Rate: 527GPM

MD: 16,412'
TVD: 7,471.04'
Inclination: 89.53°
Azimuth: 0.29°
VS: 8,557.35'



med gy, oocly dk sb blkly ctgs, i calc: MRLST mod frm-sl brit, rm resd	16280-16340 CHK (90%): predy lt-med gy, oocly dk gy, com thn chk lamn, frm predy fis sb blkly-sb ply ctgs, occ-com c free chk, tr vf pyr, mod-hi calc: MRLST (10%): dk gy, sb blkly-sb rd l-mod fis ctgs, mod frm-sl brit, occ brn incl, rr vf pp pyr, mod calc wi brn resd	16340-16400 CHK (90%): predy lt gy, oocly dk gy, abnt thn chk lamn, frm-sl fri predy fis sb blkly-sb ply ctgs, occ-com c free chk, tr vf pyr, mod-hi calc: MRLST (10%): dk gy, sb blkly l-mod fis ctgs, mod frm-sl incl, rr vf pyr, mod calc wi brn resd	16400-16460 CHK (80%): predy lt gy, oocly dk gy, com thn chk lamn, frm predy fis sb blkly ctgs, occ-com c free chk, tr vf pyr, mod-hi calc: MRLST (20%): dk gy, sb blkly l-mod fis ctgs, mod frm-sl brit, occ brn incl, rr vf pyr, mod calc wi brn resd	16460-16520 CHK (80%): predy lt-med gy, oocly dk gy, com thn chk lamn, frm predy fis sb blkly-sb ply ctgs, occ-com c free chk, tr vf pyr, mod-hi calc: MRLST (10%): dk gy, sb blkly l-mod fis ctgs, mod frm-sl incl, rr vf pyr, mod calc wi brn resd
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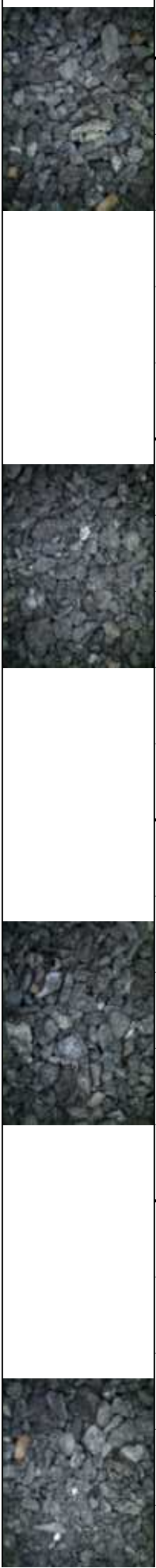
MD: 16,507'
TVD: 7,470.56'
Inclination: 91.04°
Azimuth: 359.82°
VS: 8,651.86'

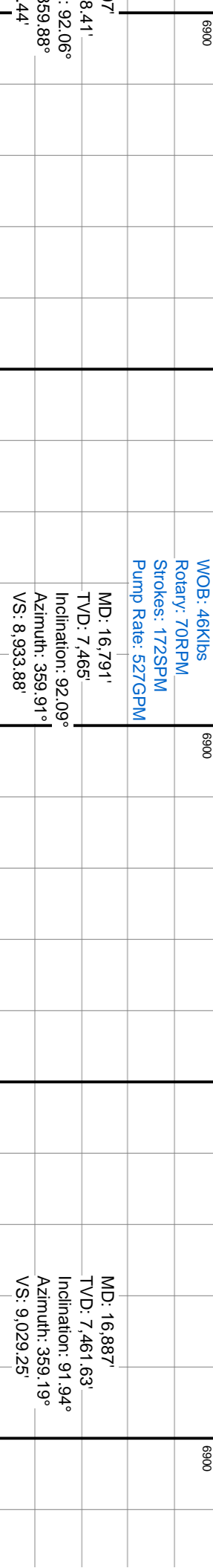
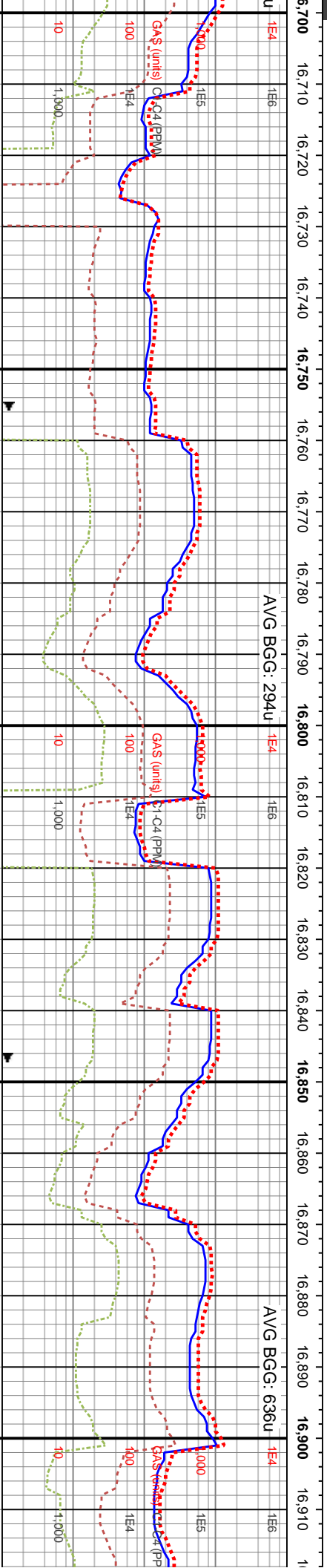
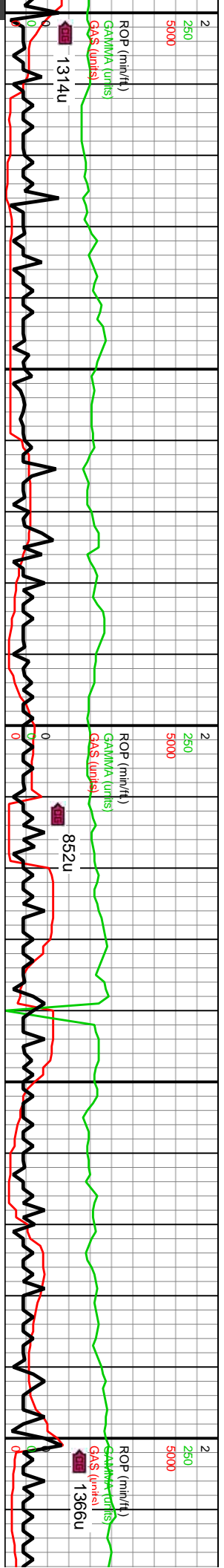
WOB: 47.9klbs
Rotary: 70RPM
Strokes: 172SPM
Pump Rate: 526GPM

MD: 16,602'
TVD: 7,469.91'
Inclination: 89.75°
Azimuth: 357.9°
VS: 8,746.16'

MD: 16,655'
TVD: 7,46
Inclination
Azimuth: 3
VS: 8,840

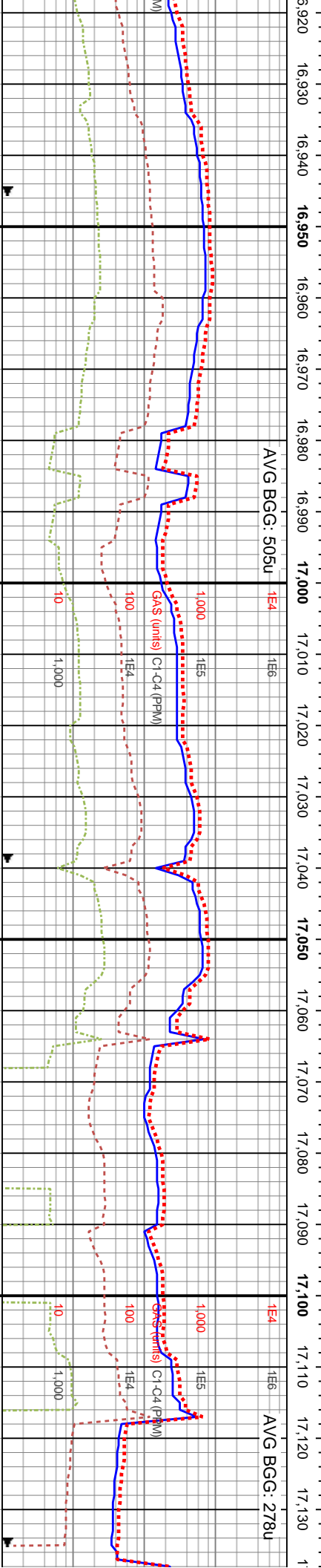
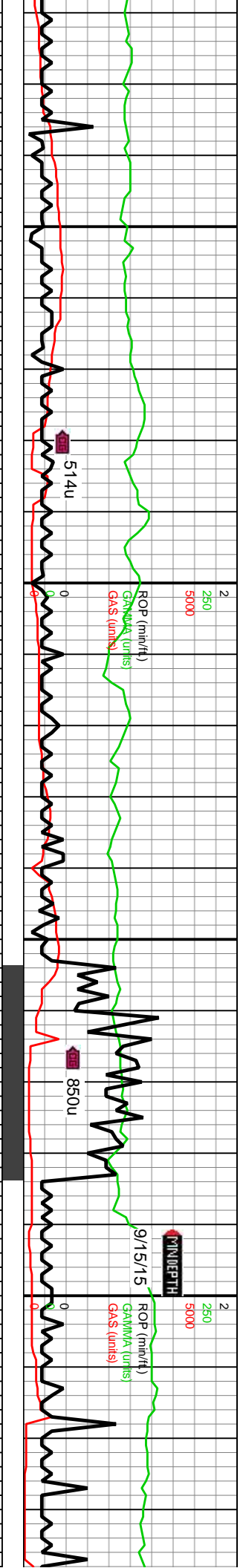
CHK (80%): predy lt-med gy, occly dk	16520-16580 CHK (75%): predy lt-med gy, occly dk	16580-16640 CHK (75%): predy lt gy, occly dk gy, com	16640-16700 CHK (80%): predy lt gy, occly dk gy, abn
lamm, frm predy fis sb blkly-sb ply	gy, abnt thn chk lamm, frm predy fis sb blkly ctgs,	thn chk lamm, frm predy fis sb blkly ctgs, occ-com c	thn chk lamm, frm predy fis sb blkly ctgs, occ c free chk
chk, tr vf pyr, mod-hi calc: MRLST	occ-com c free chk, tr vf pyr, occ pyrc nod, hi calc:	free chk, tr vf pyr, mod-hi calc: MRLST (25%): dk gy, sb	tr vf pyr, hi calc: MRLST (20%): dk gy, sb blkly l-mod fis
blkly l-mod fis ctgs, mod frm-sl brit,	MRLST (25%): dk gy, sb blkly l-mod fis ctgs, mod	blkly l-mod fis ctgs, mod frm-sl brit, occ brn incl, rr vf	ctgs, mod frm-sl brit, occ brn incl, rr vf pp pyr, mod
pyr, mod calc wi brn resd	pyr, mod calc wi brn resd	pyr, mod calc wi brn resd	calc wi brn resd





16700-16760 CHK (75%): predy lt-med gy, occly dk	16760-16820 CHK (75%): predy lt gy, occly dk gy, abnt	16820-16880 CHK (80%): predy lt gy, occly med-dk	16880-16940 CHK (80%): predy lt
gy, occ thn chk lamm, frm predy fis sb biky-sb ply ctgs, free chk, tr vf pyr, hi calc: MRLST (25%): med-dk	thn chk lamm, frm predy fis sb biky-sb ply ctgs, occ c free chk, tr vf pyr, hi calc: MRLST (25%): dk gy, sb biky-sb rd l-mod fis ctgs, mod frm-brn incl, tr vf pyr, mod calc wi brn resd	gy, abnt thn chk lamm, frm predy fis sb biky ctgs, occ c free chk, tr vf pyr, hi calc: MRLST (20%): med-dk gy, sb biky l-mod fis ctgs, mod frm-sl brit, occ brn incl, tr vf pyr, mod calc wi brn resd	thn chk lamm, frm predy fis sb biky c





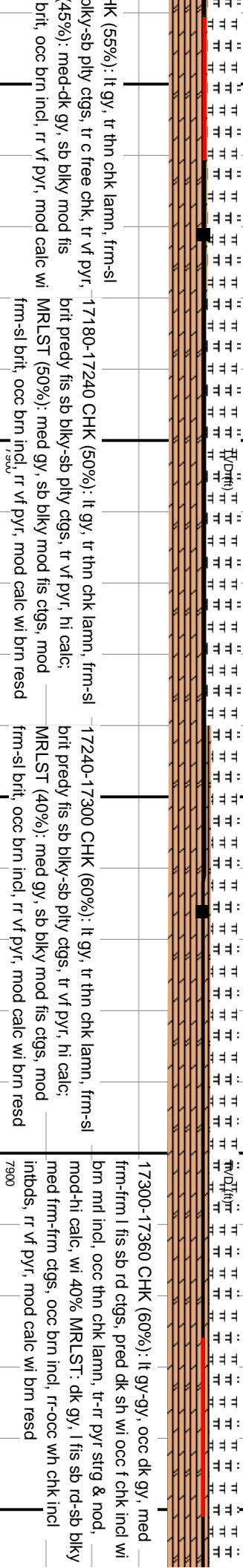
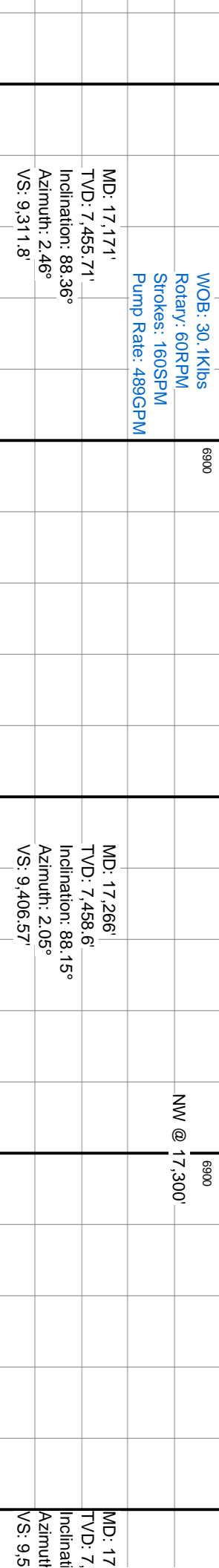
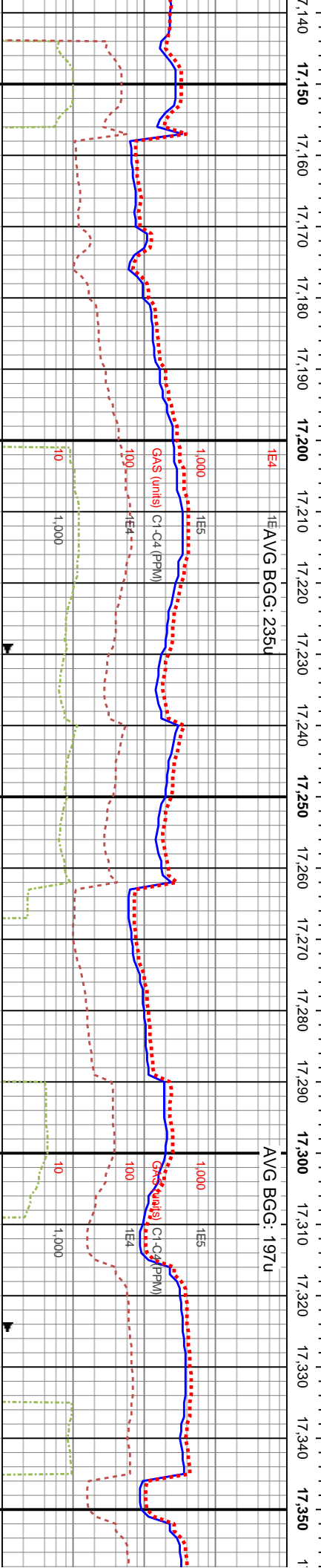
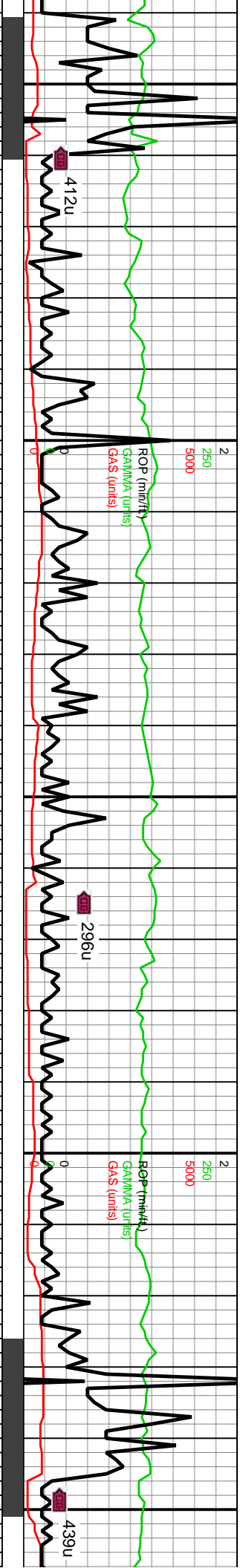
WOB: 46.5Klbs
 Rotary: 70RPM
 Strokes: 172SPM
 Pump Rate: 527GPM

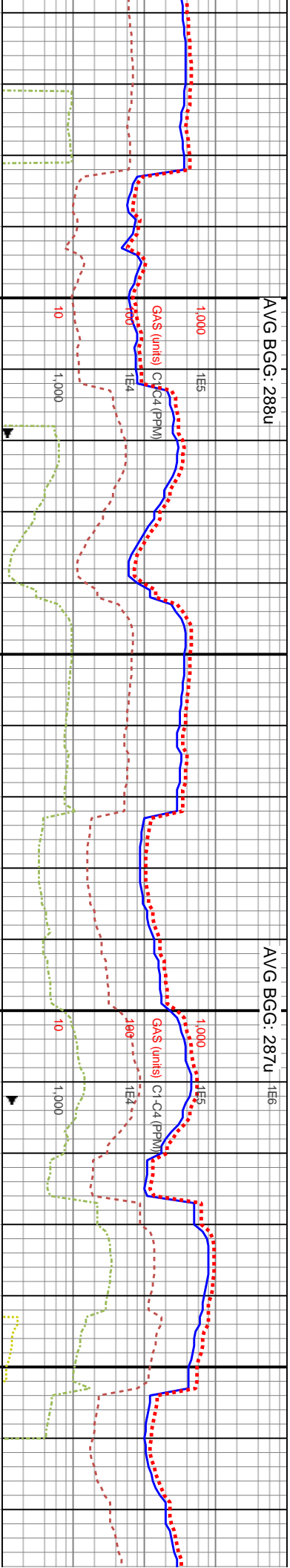
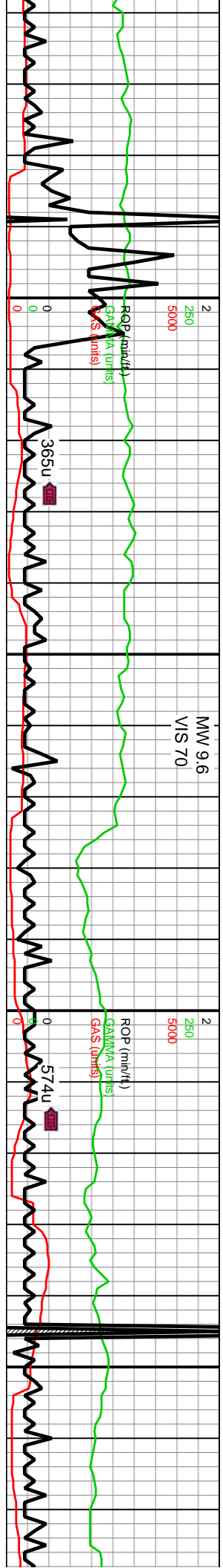
MD: 16,980'
 TVD: 7,458.11'
 Inclination: 92.4°
 Azimuth: 358.9°
 VS: 9,121.53'

MD: 17,075'
 TVD: 7,455.23'
 Inclination: 91.07°
 Azimuth: 1.52°
 VS: 9,216.03'

16940-17000 CHK (70%): predy lt gy, occly dk gy, abnt	17000-17060 CHK (80%): predy lt gy, occly dk gy, abnt	17060-17120 CHK (65%): lt gy, tr thn chk lamm, frm-sl	17120-17180 CHK (65%): lt gy, tr thn chk lamm, frm-sl
thn chk lamm, frm-sl brit predy fis sb blk-y-sb ply cigs,	thn chk lamm, frm-sl brit predy fis sb blk-y-sb ply cigs,	brit predy fis sb blk-y-sb ply cigs, tr c free chk, tr vf pyr,	brit predy fis sb blk-y-sb ply cigs, tr c free chk, tr vf pyr,
occ c free chk, tr vf pyr, hi calc: MRLST (30%): dk gy,	occ c free chk, tr vf pyr, hi calc: MRLST (20%): dk gy,	hi calc: MRLST (35%): med-dk gy, sb blk-y mod fis	hi calc: MRLST (35%): med-dk gy, sb blk-y mod fis
sb blk-y-sb ply l-mod fis cigs, mod frm-sl brit, occ brn	sb blk-y mod fis cigs, mod frm-sl brit, occ brn incl, tr vf	cigs, mod frm-sl brit, occ brn incl, tr vf pyr, mod calc wi	cigs, mod frm-sl brit, occ brn incl, tr vf pyr, mod calc wi
incl, tr vf pyr, mod calc wi brn resd	pyr, mod calc wi brn resd	brn resd	brn resd







WOB: 48Klbs
Rotary: 71RPM
Strokes: 170SPM
Pump Rate: 520GPM

360'
460.09'
on: 90.03°
t: 0.96°
00.29'

MD: 17,455'
TVD: 7,460.38'
Inclination: 89.63°
Azimuth: 0.65°
VS: 9,594.93'

MD: 17,549'
TVD: 7,461.21'
Inclination: 89.35°
Azimuth: 0.48°
VS: 9,688.53'

17360-17420 60% CHK: dk gy-gy-lt gy, med frm-frm
mod fis ctgs, pred dk sh wi occ f chk incl wi brn mrl
incl, occ thn chk lamm, tr vf pyr, mod-hi calc, wi 40%
MRLST: dk gy, l fis sb rd-sb blkly med frm-frm ctgs, occ
brn incl, rr-occ wh chk incl intbds, rr vf pyr, mod brn
calc

17420-17480 70% CHK: lt gy-gy-dk gy, med frm-frm,
mod fis ctgs, tr f chk incl, com thn chk lamm, tr vf
pyr-nod pyr strg, mod-hi calc, wi 30% MRLST: dk gy, l
fis sb rd-sb blkly med frm-frm ctgs, occ brn incl, rr vf
pyr, mod brn calc

17480-17540 CHK (80%): pred lt gy-gy v arg LS, rr dk
gy wi intbdd chk/ml incl, med frm-frm, mod fis ctgs,
com thn chk lamm, tr vf pyr-nod pyr strg, mod-hi calc,
wi 20% MRLST: dk gy, l fis sb rd-sb blkly med frm-frm
ctgs, occ brn incl, rr vf pyr, mod calc wi brn resd

17540-17600 85% CHK: lt gy-gy-dk
mod fis ctgs, tr f chk incl, com thn c
mod-hi calc, wi MRLST (15%): dk g
blkly med frm-frm ctgs, occ brn incl,
calc



