



# Empirica

Scale: 5" / 100'  
Measured Depth Log

Well Name Windsor LV G14-H

State CO

County Weld

Country USA

Rig Number H&P 319

Region DJ Basin

AFE # 14-758

Spud Date

11/7/2014

Field Wattenburg

Drilling Completed

11/14/2014

Logged Interval 7100' To 11,692'

Total Depth 4592'

Formation Niobrara B

Type of Drilling Fluid WBM

Operator

Company Extraction Oil & Gas, LLC

Geologist

Name Jared Rouse

## Zone Color Coding

Oil  
Noie  
Error

Condensate  
Core  
Water

Gas  
Press  
Seal















































## Rock Types

UNKNOWN  
ANHYDRITE  
GYPSUM  
SALT  
SIDERITE or LIMONITE  
LIMESTONE  
DOLOMITE

CHELT  
COAL  
MARLSTONE  
CHALK  
SHALE  
SHALE GRAY  
SHALE COLORET  
SILTSTONE  
SANDSTONE  
CONGLOMER  
BRECCIA  
TILL  
BENTONITE  
TUFF

## Accessories

## Fossils

Fossils	
 FOSSIL	 ARGILLACEOUS
 GASTROPOD	 ARGILLITE GRAIN
 OOLITE	 BENTONITE
 OSTRACOD	 BITUMINOUS SUBSTANCE
 PELECYPOD	 BRECCIA FRAGMENTS
 BIOCLASTIC	 CALCAREOUS
 BRACHIOPOD	 CARBONACEOUS FLAKES
 BRYOZOA	 CHITID
 CERYATLOPOD	 CHITL
 CORAL	 COAL - THIN BEDS
 CRINOID	 DOLOMITIC
 ECHINOID	 FELDSPAR
Minerals	
 FISH	 FERRUGINOUS PELLET
 FORAMINIFERA	 FERRUGINOUS
 ANHYDRITIC	 TUFFACEOUS
 GLAUCONITE	 SILTY
 GYPSIFEROUS	 SILICEOUS
Stringer	
 ANHYDRITE STRINGER	 LIMESTONE STRINGER
 BENTONITE STRINGER	 MARLSTONE (CALO) STRINGER
 COAL STRINGER	 MARLSTONE (DOL) STRINGER
 DOLOMITE STRINGER	 SANDSTONE STRINGER
 GYPSUM STRINGER	 SHALE STRINGER
 LIMESTONE STRINGER	 SILTSTONE STRINGER


## Minerals

## Other Symbols

## Oil Show

	ORGANIC		WIRELINE TESTED - RT		Fx FINELYXLN
	P PINPOINT		FORMATION TOP		Gs GRAINSTONE
	DEAD		GAS SHOW		L LITHOGRAPHIC
	EVEN		MINDEPTH MN DEPTH		Mx MICROXLN

















# Engineering

	QUESTIONABLE		M5 MUDSTONE
	SPOTTED STAINING		A ANGULAR
	BIT		R ROUNDED
	OIL SHOW		P5 PACKSTONE
	NORMAL FAULT		

## Porosity


- REVERSE FAULT
- SUBBRAND
- Sorting**
- M MODERATE
- Textures**
- SIDE WALL CORE (LEFT)
- CONNECTION (RIGHT)
- E EARTHY
- FENESTRAL
- CONNECTION GAS
- SIDE WALL CORE (RIGHT)

## Textures

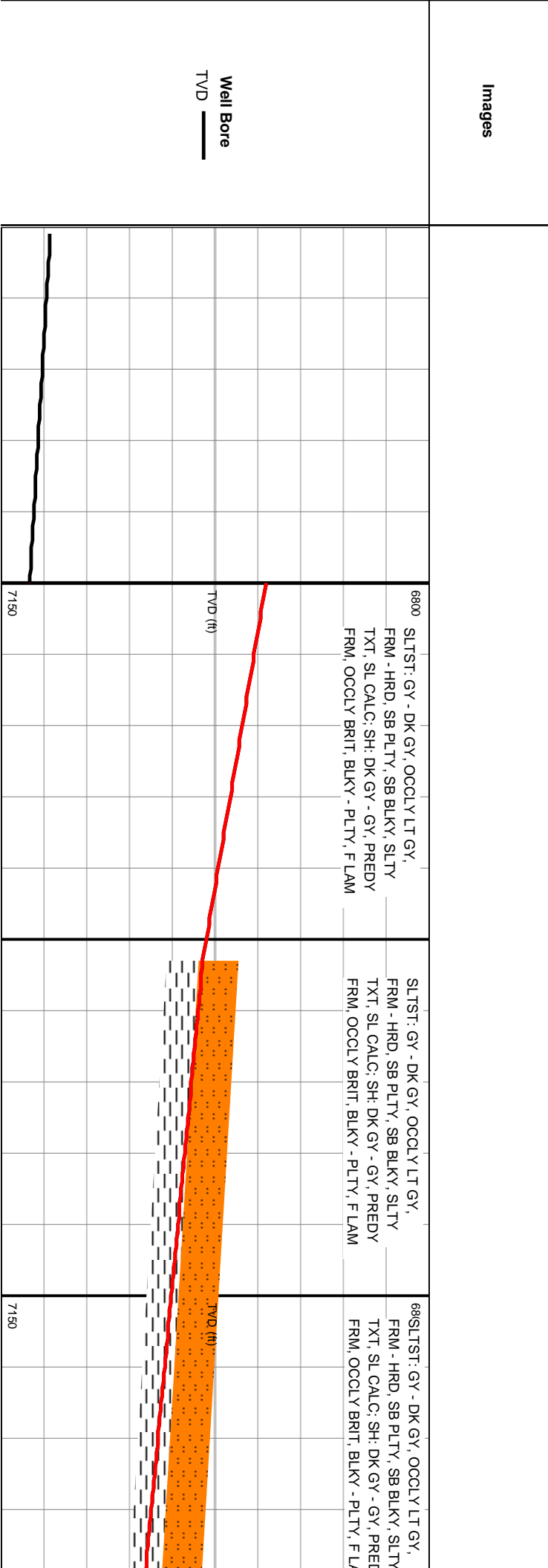
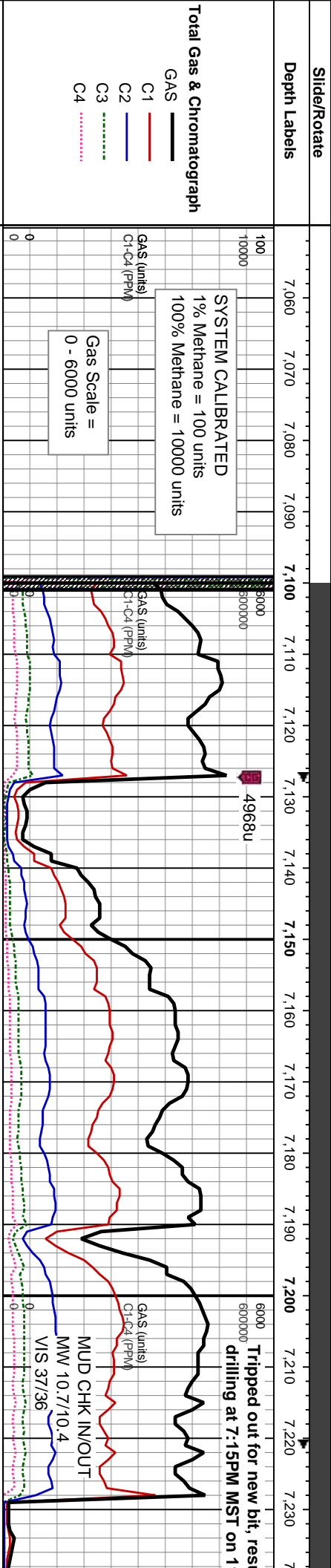
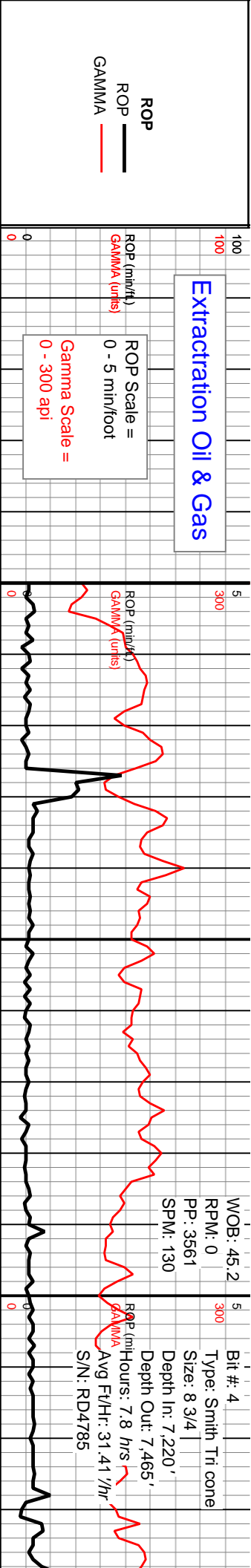
	FENESTRAL		MODE
	CONNECTION GAS		SIDEWALL CORE (RIGHT)
	CG		SLIDE
	F FRACTURE		BOUNDSTONE
	INTERCRYSTALLINE		CHALKY
	CORE - LOST		POOR
	CORE - RECOVERED		WELL
	TRIP GAS		
	INTEROOLITIC		
	CRYPTOXLN		

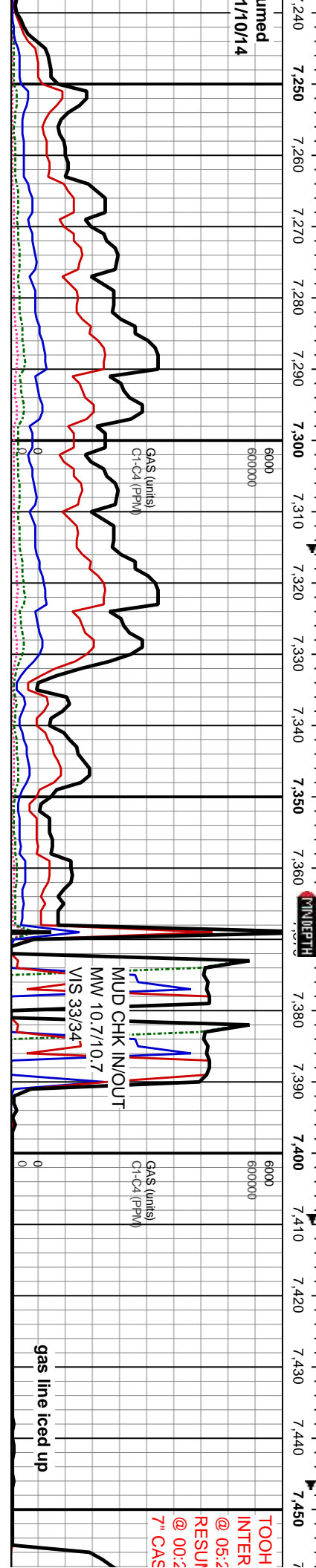
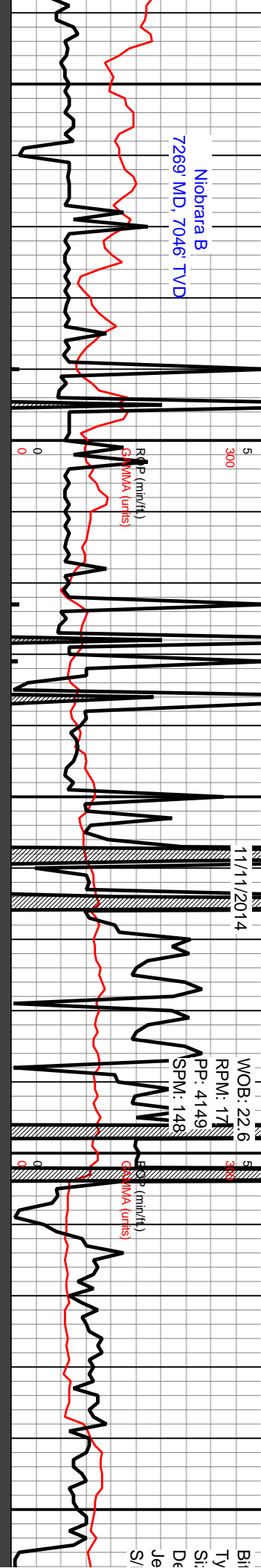
# Sorting

	FENESTRAL		BOUNDSTONE		POOR		WELL
	CONNECTION GAS		SLIDE		CHALKY		
	CORE - LOST		SURVEY				
	CG		INTERCRYSTALLINE		F FRACTURE		



IGNEOUS  
METAMORPHIC  
CEMENT  
SLTY SH  
SHY SS





SH: GY TO GY BRN, F LAM, MED FRM TO FRM TO BRIT, ABNT SLT, W HYDRATED, PLTY TO SB-ANG CTGS. OCC LT GY TO GY SLTST, W SRTD, VF GR, V FRM, NO FLOR, NO CUT	68SH: GY, SB-ANG, PLTY, MED FRM TO FRM, MOD HYDRATED, GRDS TO SLTST, RR GY SLTY SH WITH OFF WH CHKY INCL, V TR PYR, MKY CUT, RESDL FLOR RING	SH: GY, FLAT PLTY CTGS, MED FRM TO FRM, ABNT SLT. COM SLTST, GY, SB-ANG, PLTY TO SB-BLKY, V FRM TO HRD, BRIT. RR CHK, TR PYR, WK RESDL FLOR, NO CUT.	6800 SH: DK GY, ABNT SLT, SB-ANG TO SB-RND CTGS. COM LT TO MED GY SLTST, MOD-W SRTD, TR GLAU, MOD FRM TO HRD, BRIT, SIL CMT, V TR BENT, RR CHK, 5% FLOR, WK STMG CUT.	SH: GY TO LT G SRTD, MOD AR PLTY CTGS, BR ABNT SLT, 1% C
MD: 7.24f' TVD: 7.036, 4f' Inclination: 60.9° Azimuth: 264.8°	MD: 7.30f' TVD: 7.059, 7f' Inclination: 74.7° Azimuth: 268.2°	MD: 7.37f' TVD: 7.068, 7f' Inclination: 88.° Azimuth: 268.8°	MD: 7.39f' TVD: 7.069, 7f' Inclination: 89.7° Azimuth: 265.6°	
7150	7150	7150	7150	

#: 5

pe: SK516M

ee: 6.12

pth In: 7.465'

ss: 5x14's

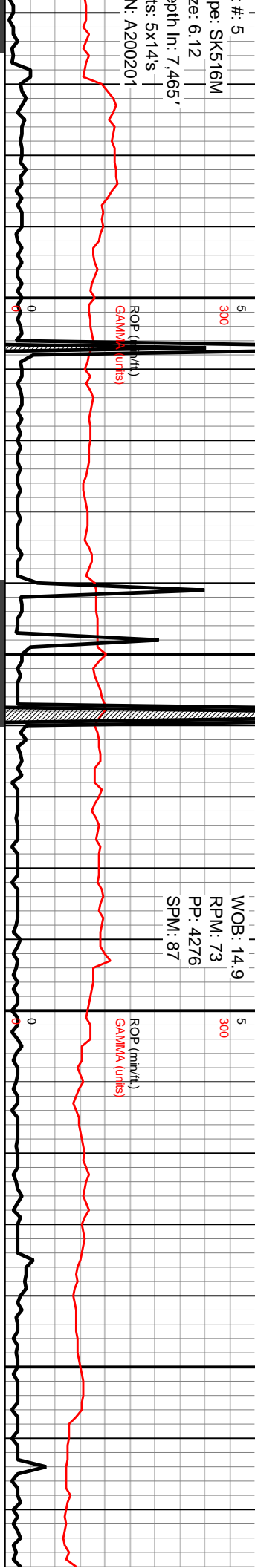
N: A200201

WOB: 14.9

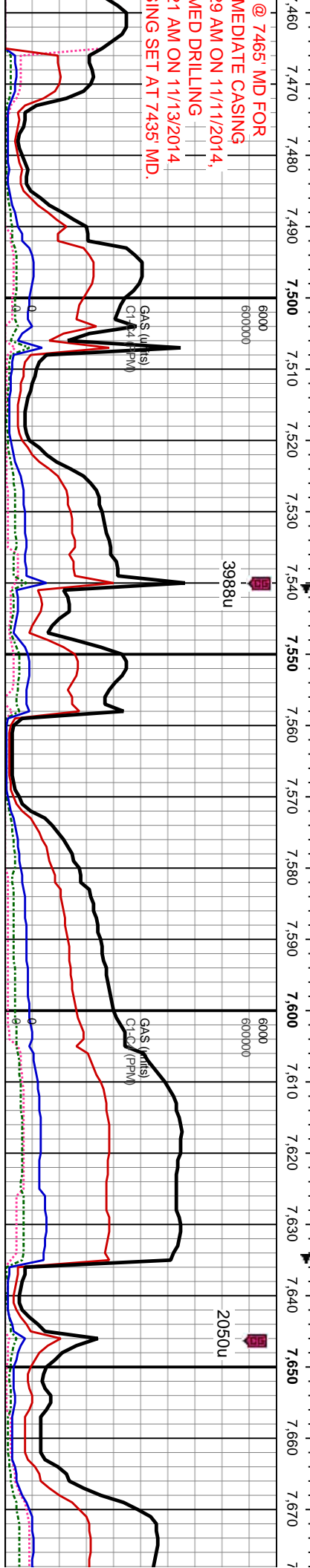
RPM: 73

PP: 4276

SPM: 87



@ 7465' MD FOR  
MEDIATE CASING  
9 AM ON 11/11/2014,  
MED DRILLING  
1 AM ON 11/13/2014  
ING SET AT 7435 MD.



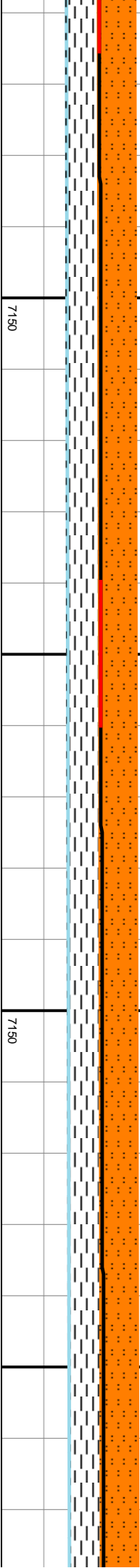
Y, FY LAM, W	6800
3. ANG TO	SH: GY, V F LAM, RAPID CLEAN HCL RXN,
IT, MOD FISS,	SMOOTH, ABNT SLT, DULL RTHY LSTR,
CHK, TR FLOR,	SMOOTH, V FRM SB-BLKY CTGS.
	COM SLTST: LT GY, TRNSL, W SRD, SB
	BLKY, WK CALC.
	VTR FLOR, NO CUT.

MD: 7.471'	TVD (ft)
TVD: 7.069.0'	
Inclination: 90.5°	
Azimuth: 265.3°	

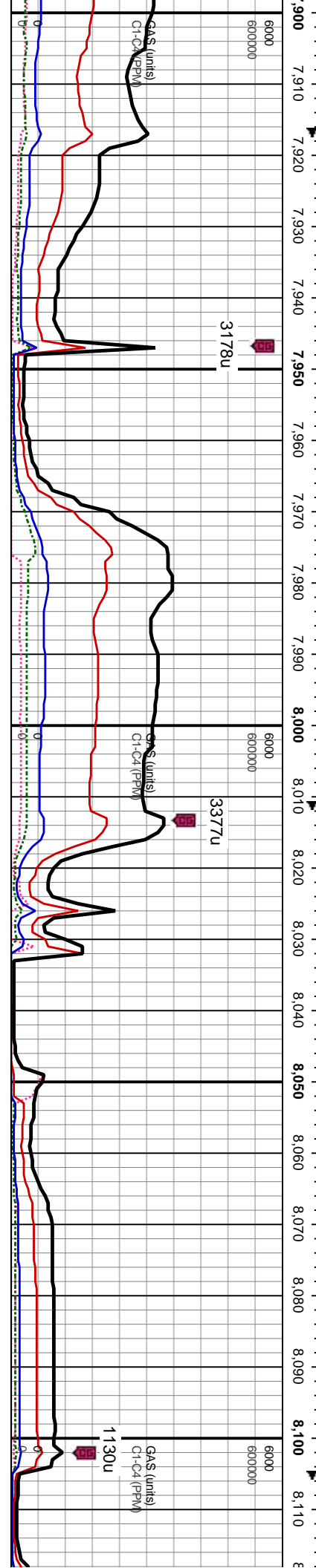
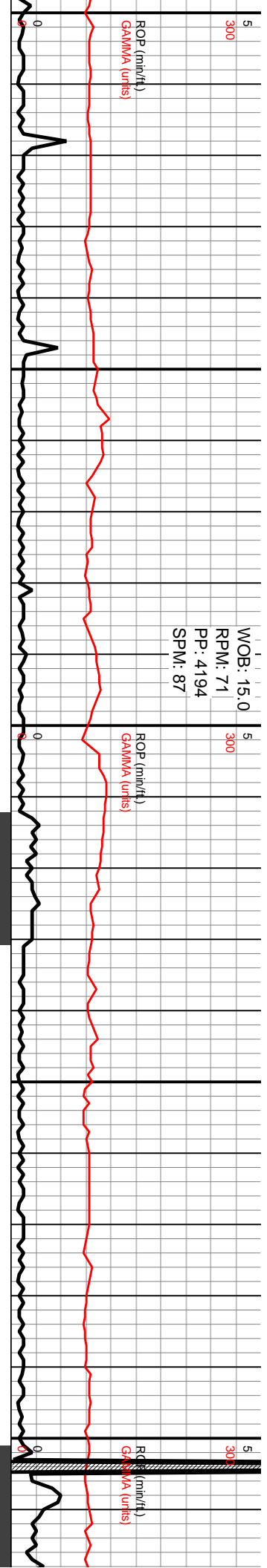
MD: 7.566'	TVD (ft)
TVD: 7.067.8'	
Inclination: 90.8°	
Azimuth: 265.1°	

MD: 7.661'	TVD (ft)
TVD: 7.066.1'	
Inclination: 91.2°	
Azimuth: 264.9°	

SH: GY TO BRN GY, SB-BLKY TO PLTY, V FRM, BRIT, V F LAM, ABNT SLT, RAPID CLEAN HCL RXN, SMOOTH, DULL RTHY LSTR, 5% CHK: OFF WH TO GY, ELG STRG IN SH CTGS AND RR OFF WH CHK CUTTINGS, VTR FLOR, NO CUT.	SH: GY TO BRN GY, V F LAM, ABNT SLT, SB-BLKY TO PLTY, V FRM, BRIT, RAPID CLEAN HCL RXN, SMOOTH, DULL RTHY LSTR, 5% CHK: OFF WH TO GY, ELG STRG AND DISSM IN SH CTGS AND RR OFF WH CHK CUTTINGS, NO FLOR, NO CUT.
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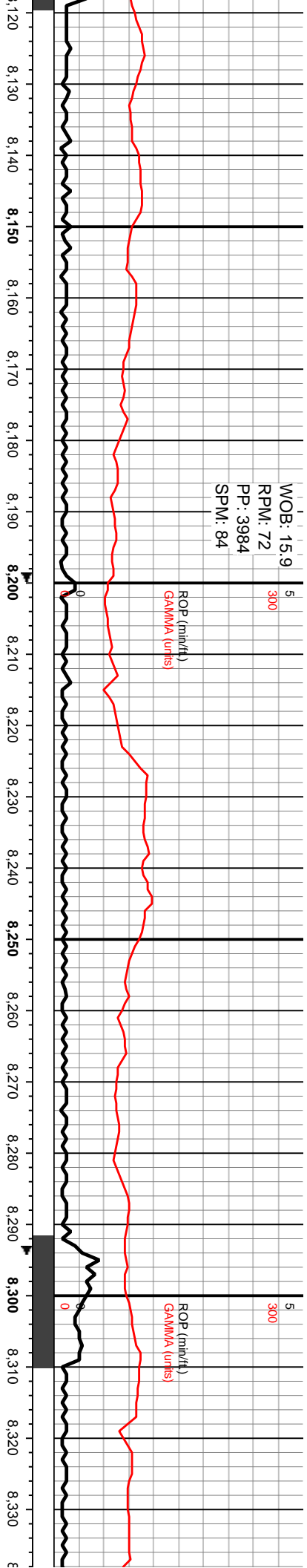
6800	SH: GY TO BRN GY, PLTY TO SB-BLKY, MOD FISS, V FRM TO HRD, F LAM, ABNT SLT, DULL RTHY LSTR, 20% CHK, CLEAN RAPID HCL RXN, RR LT GY W SRT SLTST. NO FLOR, TR RESDL CUT.	SH: GY TO BRN GY, PLTY, MOD FISS, V FRM, F LAM, DULL RTHY LSTR, ABNT SLT, 20% CHK, RAPID CLEAN HCL RXN, NO FLOR, NO CUT.	SH: GY TO BRN GY, PLTY TO SB-BLKY, MOD FISS, V FRM TO HRD, F LAM, DULL RTHY LSTR, ABNT SLT, 20% CHK, RAPID CLEAN HCL RXN, NO FLOR, NO CUT.	SH: GY TO BRN GY, SB-BLKY TO PLTY, V FRM, BRIT, V F LAM, ABNT SLT, RAPID CLEAN HCL RXN, SMOOTH, DULL RTHY LSTR, 45% CHK, OFF WH TO GY, ELG STRG IN SH CTGS AND RR OFF WH CHK CUTTINGS, V TR FLOR, NO CUT.	6800
TVD (ft)	MD: 7.944' TVD: 7.064.9' Inclination: 89.8° Azimuth: 266.1°	TVD (ft)	MD: 8.036' TVD: 7.065.2' Inclination: 89.7° Azimuth: 268.1°	TVD (ft)	60% CHK, LT-ME V SFT-SFT, SB F 40% MARL: LT-D PLTY-PLTY, FRI, BENT, V TR FLOR
7150		7150		7150	



WOB: 15.9  
RPM: 72  
PP: 3984  
SPM: 84

ROP (min/ft)  
GAMMA (units)

ROP (min/ft)  
GAMMA (units)



6000  
600000

6000  
600000

Gas (units)  
C1-C4 (PPM)

Gas (units)  
C1-C4 (PPM)

964u

973u

DK GY, SME BRN, LAM, MOT,  
LTY-BLKY, V CALC, CRPTX;  
K GY, STRI, SFT-V SFT, SB  
BRIT, SIL, VF GRN, SCAT

60% CHK: LT-MED GY, SME BRN, LAM, MOT,  
V SFT-SFT, SB PLTY-BLKY, V CALC, CRPTX;  
40% MARL: LT-DK GY, STRI, SFT-V SFT, SB  
PLTY-PLTY, FRI-BRIT, SIL, VF GRN, SCAT  
BENT, V TR FLOR

6800  
60% CHK: LT-MED GY, SME BRN, LAM, MOT,  
V SFT-SFT, SB PLTY-BLKY, V CALC, CRPTX;  
40% MARL: LT-DK GY, STRI, SFT-V SFT, SB  
PLTY-PLTY, FRI-BRIT, SIL, VF GRN, SCAT  
BENT, V TR FLOR

80% CHK: LT-MED GY, SME BRN, LAM, MOT,  
V SFT-SFT, SB PLTY-BLKY, V CALC, CRPTX;  
20% MARL: LT-DK GY, STRI, SFT-V SFT, SB  
PLTY-PLTY, FRI-BRIT, SIL, VF GRN, SCAT  
BENT, V TR FLOR

6800  
80% CHK: LT-MED GY, SME BRN, LAM,  
V SFT-SFT, SB PLTY-BLKY, V CALC,  
CRPXLN: 20% MARL: LT-DK GY, STRI,  
SFT, SB PLTY-PLTY, FRI-BRIT, SIL, V  
SCAT BENT, V TR FLOR

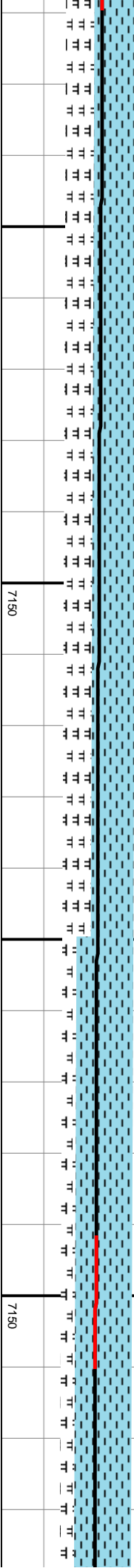
TVD (ft)

TVD (ft)

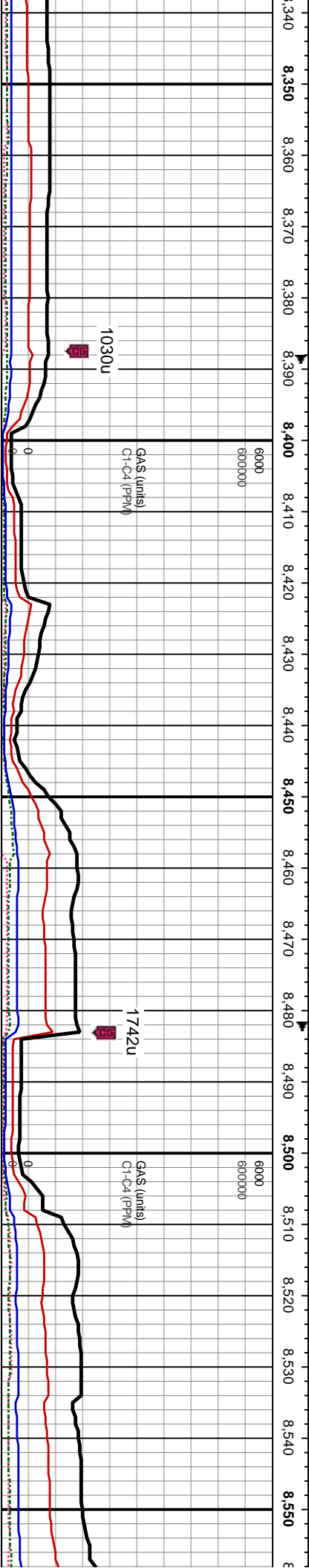
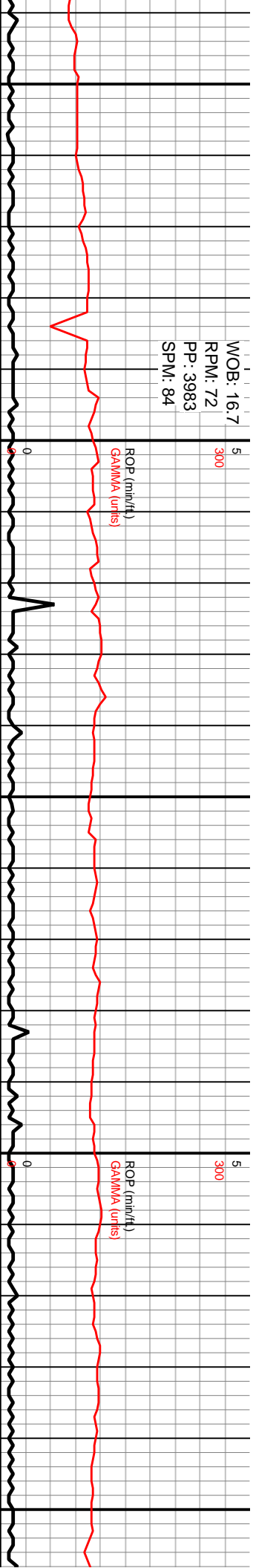
MD: 8.13°  
TVD: 7.067.2'  
Inclination: 87.8°  
Azimuth: 267.°

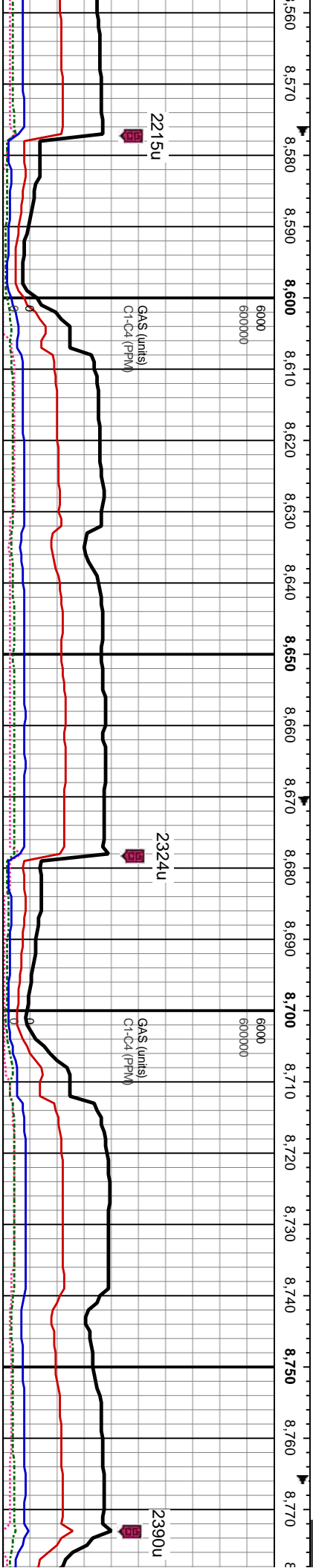
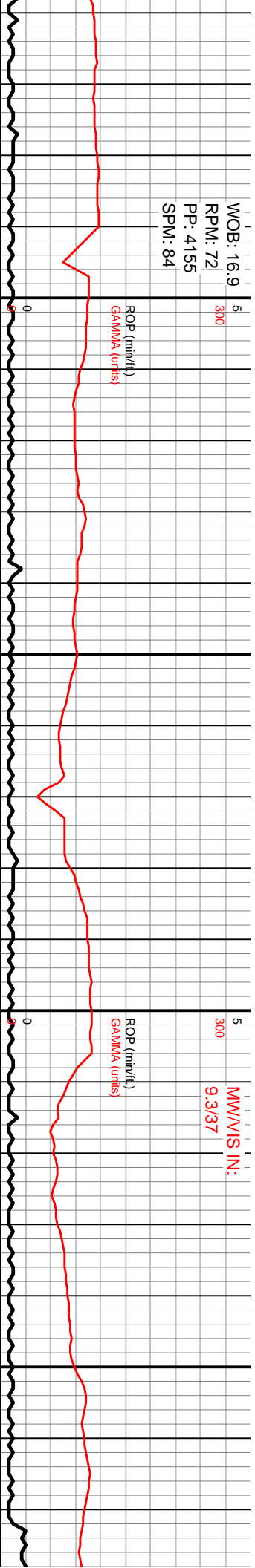
MD: 8.22°  
TVD: 7.070.6'  
Inclination: 88.0°  
Azimuth: 267.5°

MD: 8.32°  
TVD: 7.072.8'  
Inclination: 89.°  
Azimuth: 268.°





[illegible]



CHK: LT-MED GY, SME BRN, LAM, MOT, -SFT, SB PLTY-BLKY, V CALC, LN: 50% MARL: LT-DK GY, STRI, SFT-V SB PLTY-PLTY, FRI-BRIT, SIL, VF GRN, BENT, V TR FLOR	6800	50% CHK: LT-MED GY, SME BRN, LAM, MOT, V SFT-SFT, SB PLTY-BLKY, V CALC, CRPXLN: 50% MARL: LT-DK GY, STRI, SFT-V SFT, SB PLTY-PLTY, FRI-BRIT, SIL, VF GRN, SCAT BENT, V TR FLOR	70% CHK: LT-MED GY, SME BRN, LAM, MOT, V SFT-SFT, SB PLTY-BLKY, V CALC, CRPXLN: 30% MARL: LT-DK GY, STRI, SFT-V SFT, SB PLTY-PLTY, FRI-BRIT, SIL, VF GRN, SCAT BENT, V TR FLOR	6800	70% CHK: LT-MED GY, SME BRN, LAM, MOT, V SFT-SFT, SB PLTY-BLKY, V CALC, CRPXLN: 30% MARL: LT-DK GY, STRI, SFT-V SFT, SB PLTY-PLTY, FRI-BRIT, SIL, VF GRN, SCAT BENT, V TR FLOR	60% CHK: LT-MED GY, SME BRN, LAM, MOT, V SFT-SFT, SB PLTY-BLKY, V CALC, CRPXLN: 40% MARL: LT-DK GY, STRI, SFT-V SFT, SB PLTY-PLTY, FRI-BRIT, SIL, VF GRN, DULL YEL FLOR
	MD: 8.602' TVD: 7.074.5' Inclination: 90.3° Azimuth: 269.0°	MD: 8.696' TVD: 7.073.4' Inclination: 90.8° Azimuth: 268.8°				
	TVD (ft)	TVD (ft)				
	7150	7150				

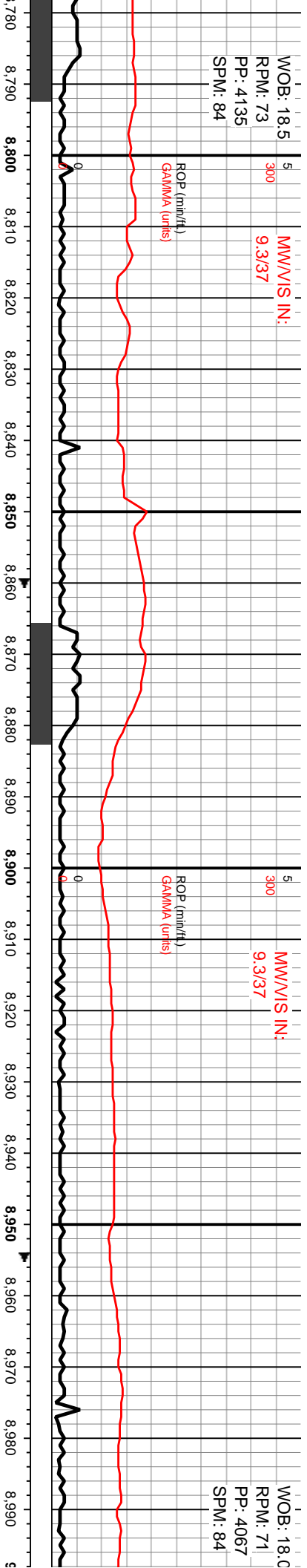
MOB: 18.5	
RPM: 73	
PP: 4135	
SPM: 84	

MM/VS IN:  
9.3/37

ROP (min/ft.)  
GAMMA (units)

ROP (min/ft.)  
GAMMA (units)

WOB: 18.0  
RPM: 71  
PP: 4067  
SPM: 84



000009  
0000

3198u

0000

000

2924u

GAS (units)  
C1-C4 (PPM)

GAS (units)  
C1-C4 (PPM)

SMER BRN, LAM,  
TY-BLKY, V  
ARL: LT-DK GY,  
TY-PLTY,  
SCAT BENT,

50% CHK: LT-MED GY, SME BRN, LAM,  
MOT, V SFT-SFT, SB PLY-BLKY, V  
CALC, CRPXLN, 50% MARL: LT-DK GY,  
STR, SFT-V SFT, SB PLY-PLY,  
FRI-BRIT, SIL, VF GRN, SCAT BENT,  
DULL YEL FLOR

50% CHK: LT-MED GY, SME BRN, LAM,  
MOT, V SFT-SFT, SB PLTY-BLKY, V  
CALC, CRPXLN: 50% MARL: LT-DK GY,  
STR1, SFT-V-SFT, SB PLTY-PLTY,  
FR1-BRIT, SIL, VF GRN, SCAT BENT,  
DULL YEL FLOR

70% CHK: LT-MED GY, SME BRN, LAM,  
MOT, V SFT-SFT, SB PLTY-BLKY, V  
CALC, CRPXLN: 30% MARL: LT-DK GY,  
STR1 SFT-V SFT, SB PLTY-PLTY,  
FR1-BRIT, SIL, VF GRN, SCAT BENT, V  
TR FLOR

70% CHK; LT-MED GY, SWE BRN, LAM,  
MOT, V SFT-SFT, SB PLY-BLKY, V  
CALC, CRPYLN: 30% MARL; LT-DK GY,  
STR1, SFT-V SFT, SB PLY-PLY,  
FR1-BRIT, SIL, VF GRN, SCAT BENT, V  
TR FLOR

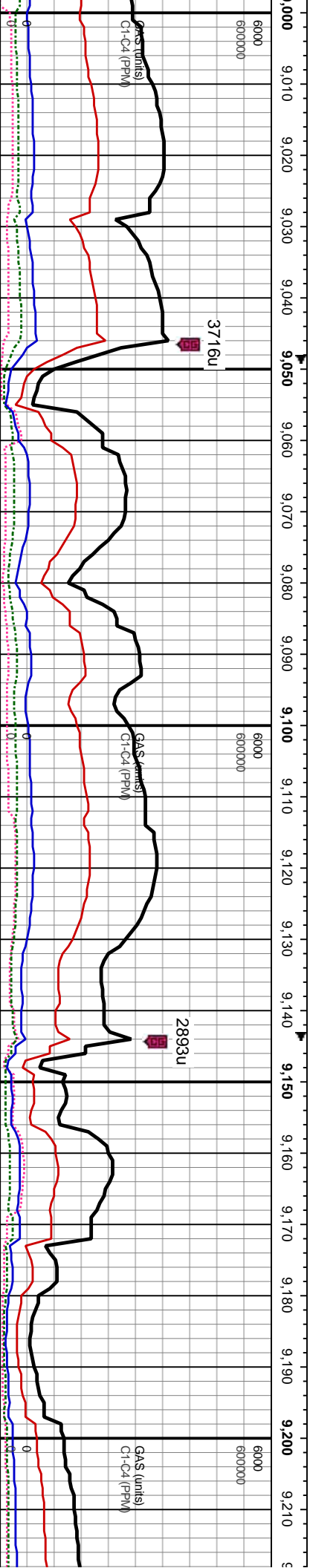
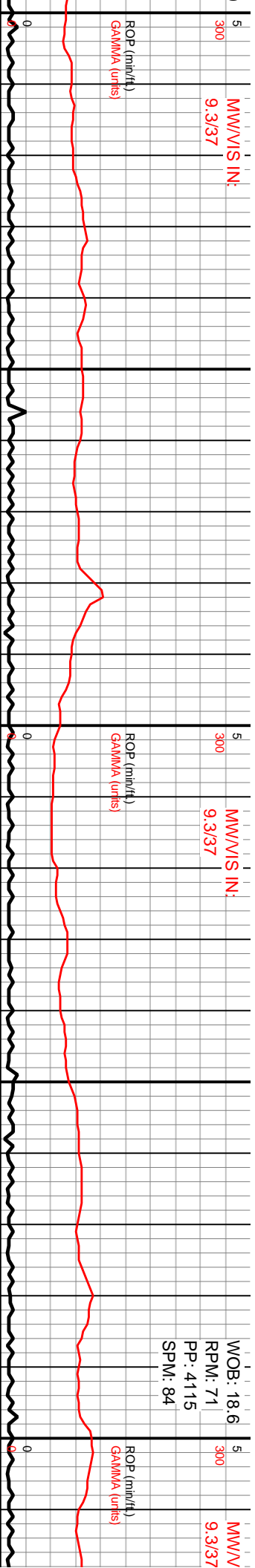
MD: 8.79c'  
TVD: 7,072.6'  
Inclination: 90.1°  
Azimuth: 269.6°

TV<sub>D</sub> (ft)

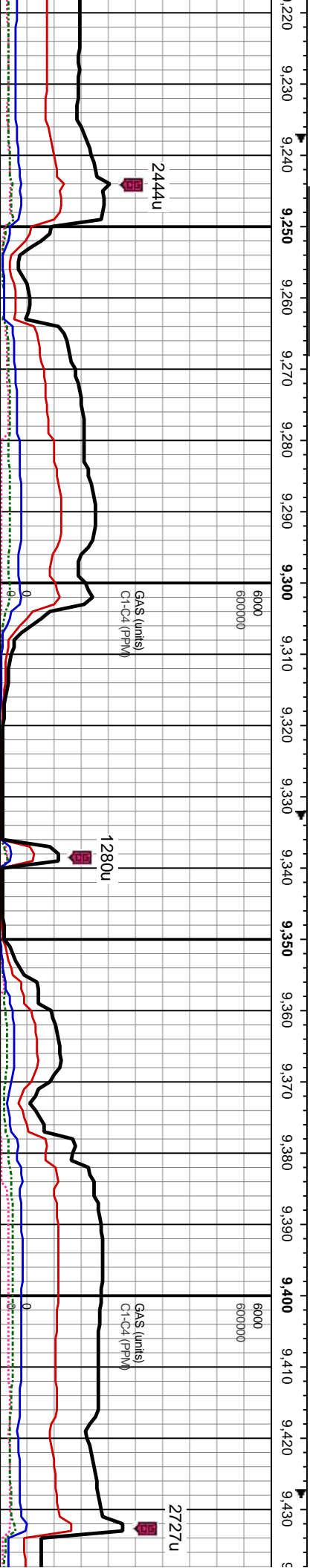
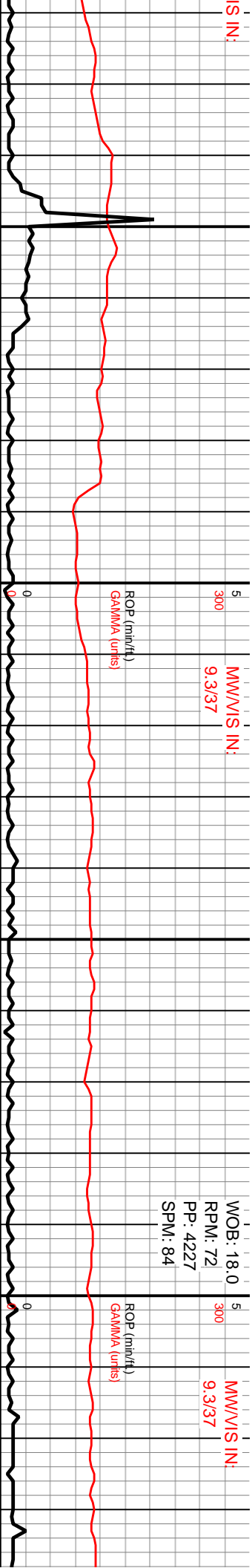
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Inclination: 89.4°  
Azimuth: 268.8°

TV<sub>D</sub> (ft)

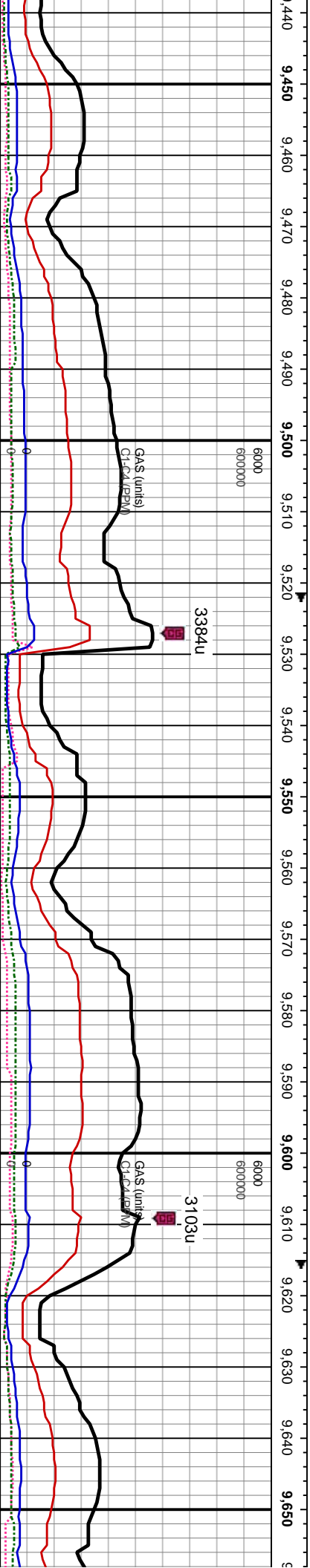
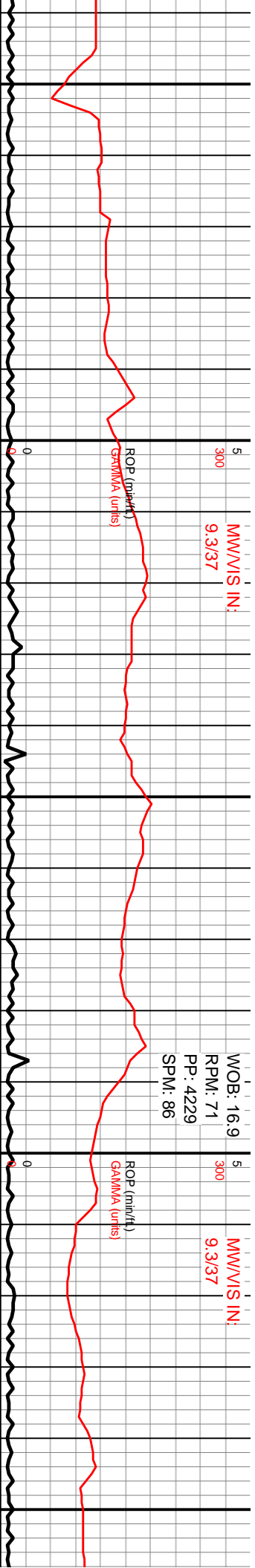
MD: 8,982'  
TVD: 7,073.4'  
Inclination: 90.0°  
Azimuth: 268.9°



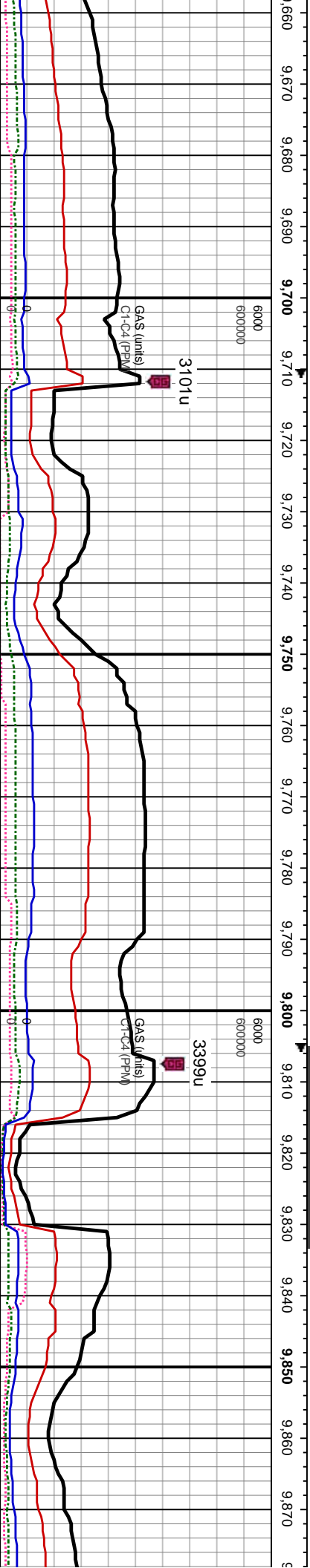
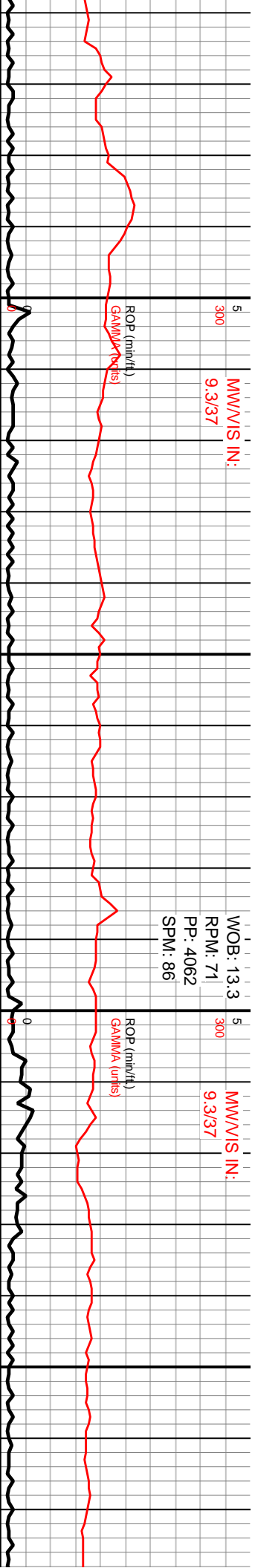
6800	50% CHK: LT-MED GY, SME BRN, LAM, MOT, V SFT-SFT, SB PLTY-BLKY, V CALC, CRPXLN: 50% MARL: LT-DK GY, STR1, SFT-V SFT, SB PLTY-PLTY, FRI-BRIT, SIL, VF GRN, SCAT BENT, DULL YEL FLOR	6800	70% CHK: LT-MED GY, SME BRN, LAM, MOT, V SFT-SFT, SB PLTY-BLKY, V CALC, CRPXLN: 30% MARL: LT-DK GY, STR1, SFT-V SFT, SB PLTY-PLTY, FRI-BRIT, SIL, VF GRN, SCAT BENT, V TR FLOR	6800	70% CHK: LT-MED GY, SME BRN, LAM, MOT, V SFT-SFT, SB PLTY-BLKY, V CALC, CRPXLN: 30% MARL: LT-DK GY, STR1, SFT-V SFT, SB PLTY-PLTY, FRI-BRIT, SIL, VF GRN, SCAT BENT, V TR FLOR	6800	50% CHK: LT-F MOT, V SFT-S CALC, CRPXL STR1, SFT-V S FRI-BRIT, SIL, DULL YEL FLOR
TVD (ft)		TVD (ft)		TVD (ft)		TVD (ft)	
	MD: 9.07' TVD: 7.073.0' Inclination: 90.3° Azimuth: 269.2°		MD: 9.17' TVD: 7.072.1' Inclination: 90.7° Azimuth: 269.6°				
7150		7150		7150		7150	



MED GY, SME BRN, LAM, FT, SB PLTY-BLKY, V N: 50% MARL: LT-DK GY, FT, SB PLTY-PLTY, VF GRN, SCAT BENT, OR	50% CHK: LT-MED GY, SME BRN, LAM, MOT, V SFT-SFT, SB PLTY-BLKY, V CALC, CRPXLN: 50% MARL: LT-DK GY, STR1, SFT-V SFT, SB PLTY-PLTY, FR1-BRIT, SIL, VF GRN, SCAT BENT, DULL YEL FLOR	6800	50% CHK: LT-MED GY, SME BRN, LAM, MOT, V SFT-SFT, SB PLTY-BLKY, V CALC, CRPXLN: 50% MARL: LT-DK GY, STR1, SFT-V SFT, SB PLTY-PLTY, FR1-BRIT, SIL, VF GRN, SCAT BENT, DULL YEL FLOR	6800	50% CHK: LT-MED GY, SME BRN, LAM, MOT, V SFT-SFT, SB PLTY-BLKY, V CALC, CRPXLN: 50% MARL: LT-DK GY, STR1, SFT-V SFT, SB PLTY-PLTY, FR1-BRIT, SIL, VF GRN, SCAT BENT, DULL YEL FLOR	6800	50% CHK: LT-MED GY, SME BRN, LAM, MOT, V SFT-SFT, SB PLTY-BLKY, V CALC, CRPXLN: 50% MARL: LT-DK GY, STR1, SFT-V SFT, SB PLTY-PLTY, FR1-BRIT, SIL, VF GRN, SCAT BENT, DULL YEL FLOR	6800
MD: 9.261' TVD: 7,071.8' Inclination: 89.0° Azimuth: 269.8°		TVD (ft)	MD: 9.361' TVD: 7,072.2' Inclination: 89.9° Azimuth: 269.9°		TVD (ft)	MD: 9.361' TVD: 7,072.2' Inclination: 89.9° Azimuth: 269.9°		TVD (ft)
7150			7150			7150		

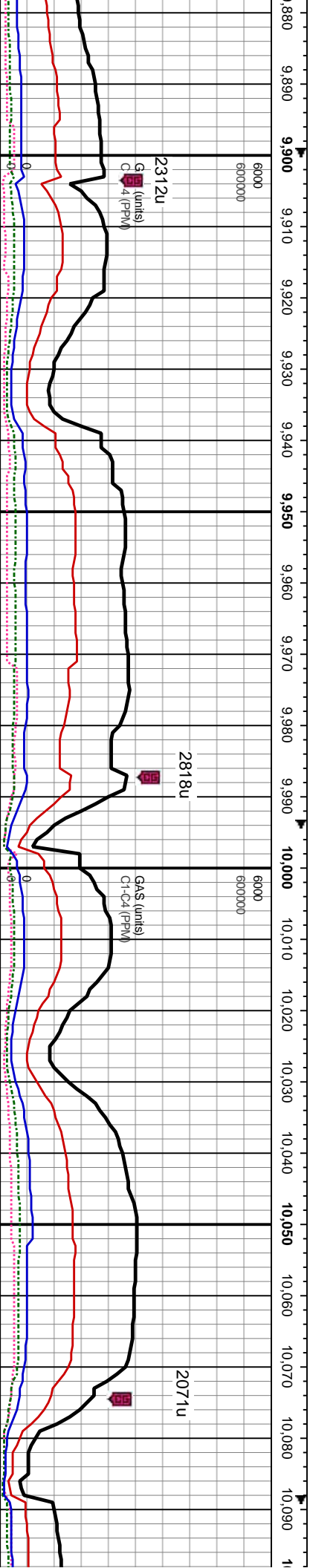
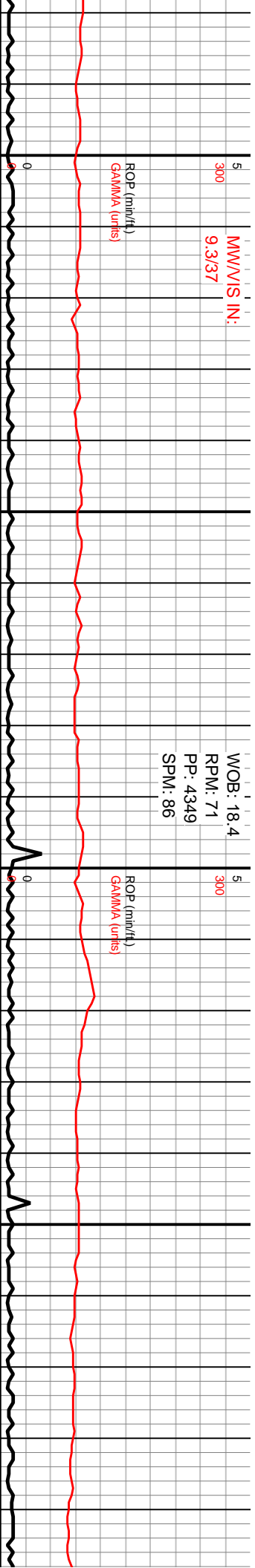


AM, GY, 50% CHK: LT-MED GY, SME BRN, LAM, MOT, V SFT-SFT, SB PLTY-BLKY, V CALC, CRPXLN: 50% MARL: LT-DK GY, STRI, SFT-V SFT, SB PLTY-PLTY, FRI-BRIT, SIL, VF GRN, SCAT BENT, DULL YEL FLOR	6800	70% MARL: LT-DK GY, STRI, SFT-V SFT, SB PLTY-PLTY, FRI-BRIT, SIL, VF GRN, SCAT BENT, DULL YEL FLOR: 30% CHK: LT-MED GY, SME BRN, LAM, MOT, V SFT-SFT, SB PLTY-BLKY, V CALC, CRPXLN	6800	70% MARL: LT-DK GY, STRI, SFT-V SFT, SB PLTY-PLTY, FRI-BRIT, SIL, VF GRN, SCAT BENT, DULL YEL FLOR: 30% CHK: LT-MED GY, SME BRN, LAM, MOT, V SFT-SFT, SB PLTY-BLKY, V CALC, CRPXLN	6800	70% SB F SCA LT-A SFT GRF
MD: 9.45° TVD: 7.072, 1° Inclination: 90.1° Azimuth: 270.6°	TVD (ft)	MD: 9.54° TVD: 7.074, 9° Inclination: 90.5° Azimuth: 270.7°	TVD (ft)	MD: 9.64° TVD: 7.074, 1° Inclination: 90.5° Azimuth: 271.0°	TVD (ft)	
7150		7150		7150		

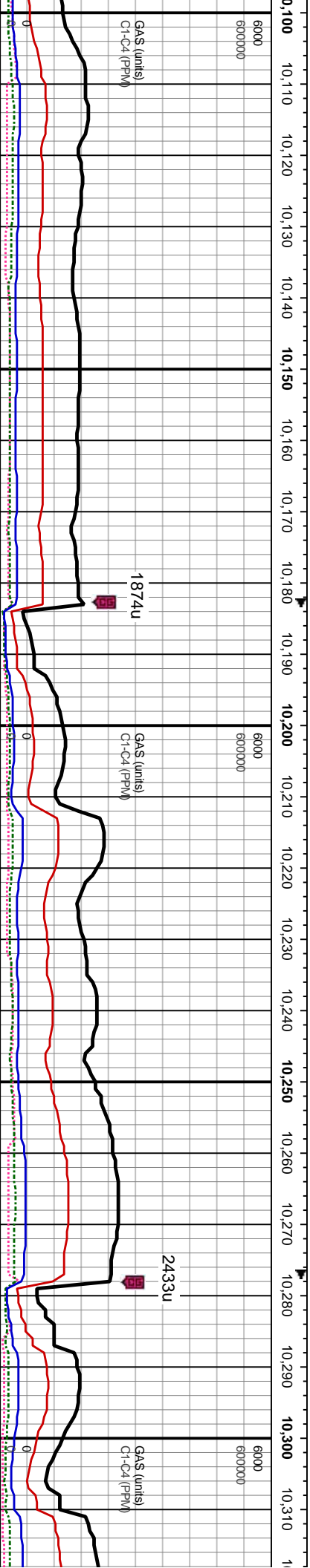
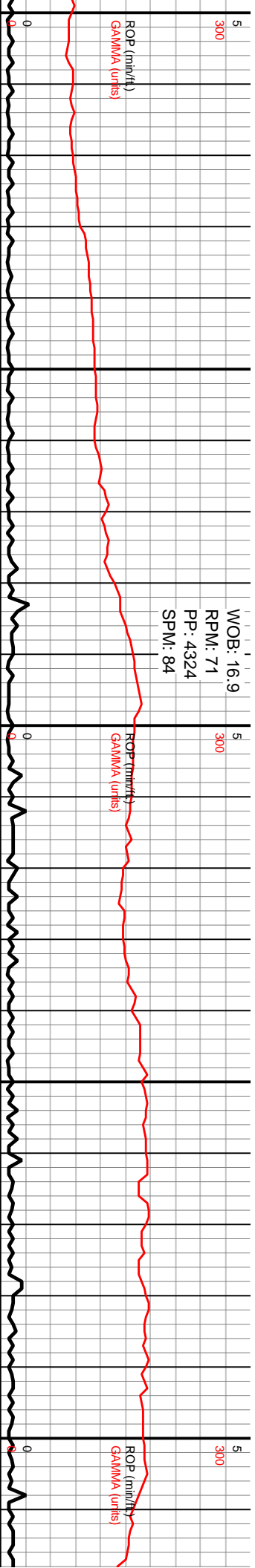


MARL: LT-DK GY, STRI, SFT-V SFT, PLTY-PLTY, FR1-BRIT, SIL, VF GRN, T BENT, DULL YEL FLOP: 30% CHK: MED GY, SME BRN, LAM, MOT, V SFT, SB PLTY-BLKY, V SFT, SB PLTY-BLKY, V CALC, CRPXLN: 50% MARL: LT-DK GY, FR1-BRIT, SIL, VF GRN, SCAT BENT, DULL YEL FLOP	6800	50% CHK: LT-MED GY, SME BRN, LAM, MOT, V SFT-SFT, SB PLTY-BLKY, V CALC, CRPXLN: 50% MARL: LT-DK GY, STRI, SFT-V SFT, SB PLTY-PLTY, FR1-BRIT, SIL, VF GRN, SCAT BENT, DULL YEL FLOP	6800	50% CHK: LT-MED GY, SME BRN, LAM, MOT, V SFT-SFT, SB PLTY-BLKY, V CALC, CRPXLN: 50% MARL: LT-DK GY, STRI, SFT-V SFT, SB PLTY-PLTY, FR1-BRIT, SIL, VF GRN, SCAT BENT, DULL YEL FLOP	6800	60% CHK: LT-MED GY, SME BRN, LAM, MOT, V SFT-SFT, SB PLTY-BLKY, V CALC, CRPXLN: 40% MARL: LT-DK GY, STRI, SFT-V SFT, SB PLTY-PLTY, FR1-BRIT, SIL, VF GRN, SCAT BENT, DULL YEL FLOP	6800
TVD (ft)		TVD (ft)		TVD (ft)		TVD (ft)	
MD: 9.736'		MD: 9.837'		MD: 9.837'		MD: 9.837'	
TVD: 7.073.1'		TVD: 7.073.2'		TVD: 7.073.2'		TVD: 7.073.2'	
Inclination: 90.6°		Inclination: 89.2°		Inclination: 89.2°		Inclination: 89.2°	
Azimuth: 271.0°		Azimuth: 270.4°		Azimuth: 270.4°		Azimuth: 270.4°	
7150		7150		7150		7150	

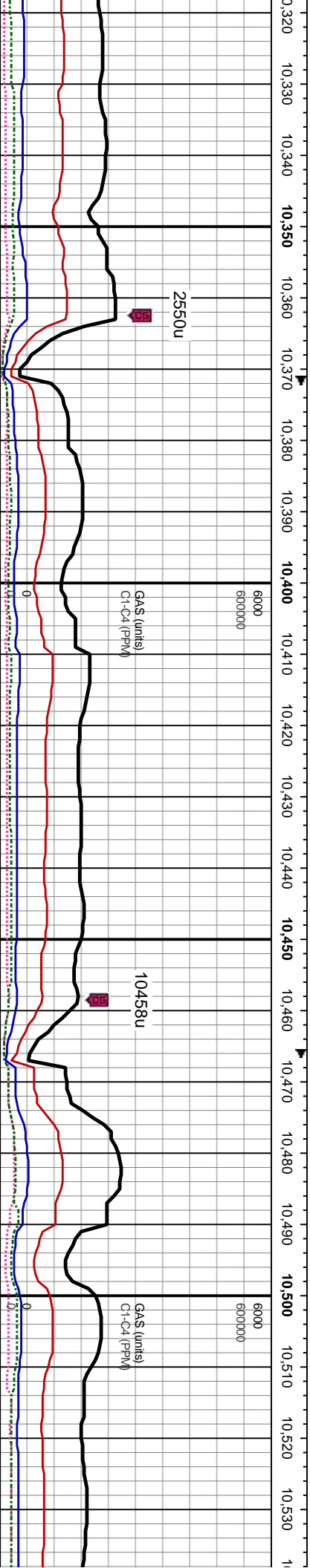
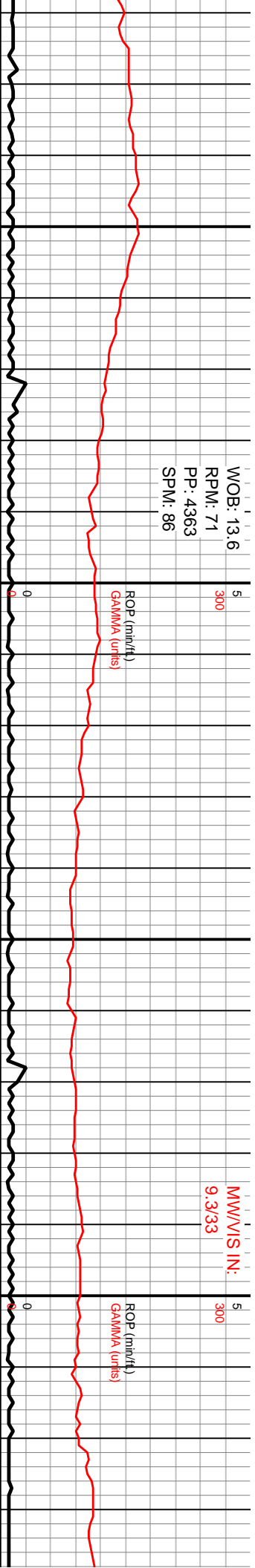




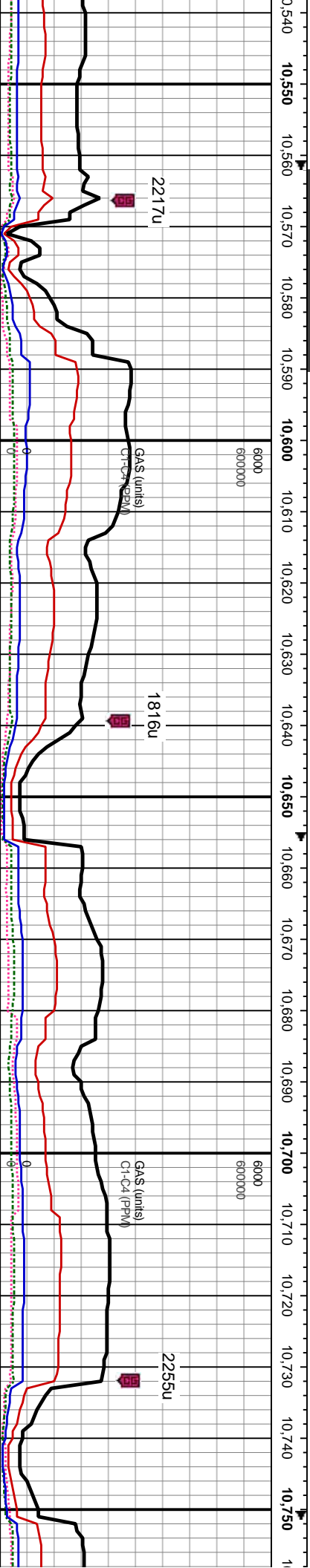
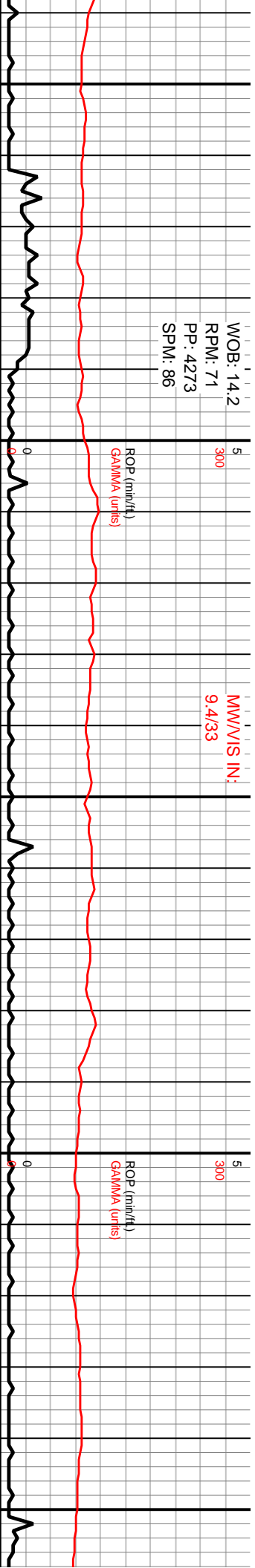
60% CHK: LT-MED GY, SME BRN, LAM, MOT, V SFT-SFT, SB PLTY-BLKY, V CALC, CRPXLN: 40% MARL: LT-DK GY, STRI, SFT-V SFT, SB PLTY-PLTY, FRI-BRIT, SIL, VF GRN, SCAT BENT, DULL YEL FLOR	60% CHK: LT-MED GY, SME BRN, LAM, MOT, V SFT-SFT, SB PLTY-BLKY, V CALC, CRPXLN: 40% MARL: LT-DK GY, STRI, SFT-V SFT, SB PLTY-PLTY, FRI-BRIT, SIL, VF GRN, SCAT BENT, DULL YEL FLOR	60% CHK: MED GY TO BRN-GY, LAM, MOT, SFT, SB PLTY-BLKY, V CALC, CRPXLN: 40% MARL: LT-DK GY, STRI, SFT, SB PLTY-PLTY, FRI-BRIT, SIL, VF GRN, SCAT BENT, TR DULL YEL FLOR, MILKY CUT, TR PYR.	60% CHK: MED GY TO BRN-GY, LAM, MOT, SFT, SB PLTY-BLKY, V CALC, CRPXLN: 40% MARL: LT-DK GY, STRI, SFT, SB PLTY-PLTY, FRI-BRIT, SIL, VF GRN, SCAT BENT, TR DULL YEL FLOR, MILKY CUT, TR PYR.
6800	6800	6800	6800
MD: 9.927' TVD: 7,074.7' Inclination: 88.9° Azimuth: 270.6°	MD: 10.027' TVD: 7,076.4' Inclination: 89.0° Azimuth: 270.3°		
TVD (ft)	TVD (ft)		
7150	7150		



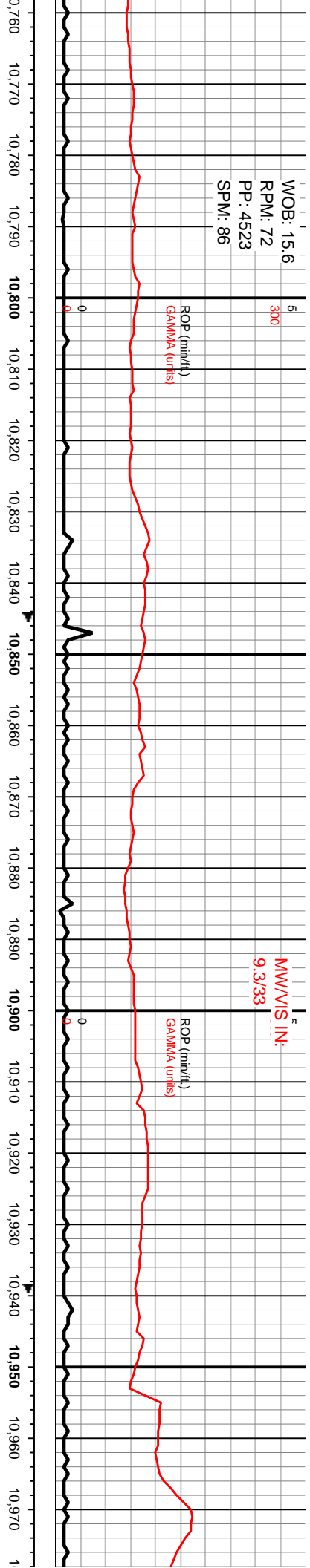
6800	60% CHK: GY TO BRN-GY, LAM, MOT, V SFT-SFT, SB PLTY-BLKY, V CALC, CRPXLN: 40% MARL: LT-DK GY, STRI, SFT-V SFT, SB PLTY-PLTY, FRI-BRIT, SIL, VF GRN, SCAT BENT, DULL YEL FLOR, WK RESDL RING	6800	60% CHK: GY TO BRN-GY, LAM, MOT, V SB PLTY-BLKY, V SFT-SFT, V CALC, 40% MARL: LT-DK GY, STRI, SFT-FRM, SB PLTY-PLTY, FRI-BRIT, SIL, VF GRN, CRPXLN, SCAT BENT, DULL YEL FLOR, NO CUT. 1% DISSM V F PYR	6800	70% CHK: MED LAM, CRPXLN, CALC, 30% MA SFT-FRM, SB F FRI-BRIT, SIL, V DULL YEL FLOR GR PYR
TVD (ft)	MD: 10.11ft TVD: 7,077.6' Inclination: 89.4° Azimuth: 270.4°	TVD (ft)	MD: 10.21ft TVD: 7,078.5' Inclination: 89.4° Azimuth: 270.7°	TVD (ft)	MD: 10.30ft TVD: 7,078.8' Inclination: 90.1° Azimuth: 270.8°
7150	7150	7150	7150	7150	7150



-GY TO BRN-GY, MOT, SB PLTY-SB BLKY, SFT, V																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				</
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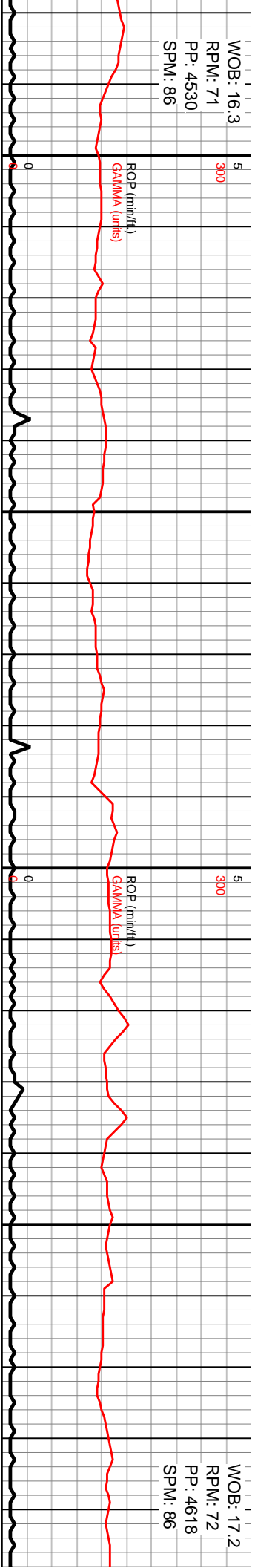


60% CHK. LT-MED GRY. SME BRN-GY, VF LAM, MOT, V CALC, CRPXLN, SB BLKY-PLTY, MOD SFT-FRM, 40% MARL: MED-DK GY, SMOOTH, PLTY-SB BLKY, VF GRND, MOD SFT-HRD, SIL, TR DISSM VF GRND PYR, SCAT BENT. DULL YEL FLOR, WK MLKY RESDL RING.	6800	60% CHK: LT-MED GRY, SME BRN-GY, VF LAM, MOT, V CALC, CRPXLN, SB BLKY-PLTY, MOD SFT-FRM, 40% MARL: MED-DK GY, SMOOTH, PLTY-SB BLKY, VF GRND, MOD SFT-HRD, SIL, TR DISSM VF GRND PYR, SCAT BENT. DULL YEL FLOR, WK MLKY RESDL RING.	6800	60% CHK: LT-MED GRY TO BRN-GY, CRPXLN, MOT, VF LAM, V CALC, SB BLKY-SB PLTY, MOD-FRM, 40% MARL: MED-DK GY, PLTY-SB BLKY, VF GRND, MOD SFT-HRD, SIL, SMOOTH, DULL RTHY LSTR. TR DISSM VF GRND PYR. SCAT BENT. DULL YEL FLOR, MLKY CUT.	6800	60% C MOT, V CALC, CRPXLN, SB BLKY-PLTY, MOD-FRM, 40% MARL: MED-DK GY, SMOOTH, PLTY-SB BLKY, VF GRND, MOD SFT-HRD, SIL, TR DISSM VF GRND PYR, SCAT BENT. DULL YEL FLOR, MLKY RESDL RING.
MD: 10.58° TVD: 7,078.5' Inclination: 88.8° Azimuth: 269.1°	TVD (ft)	MD: 10.68° TVD: 7,080.2' Inclination: 88.9° Azimuth: 269.1°	TVD (ft)	MD: 10.68° TVD: 7,080.2' Inclination: 88.9° Azimuth: 269.1°	TVD (ft)	
7150		7150		7150		



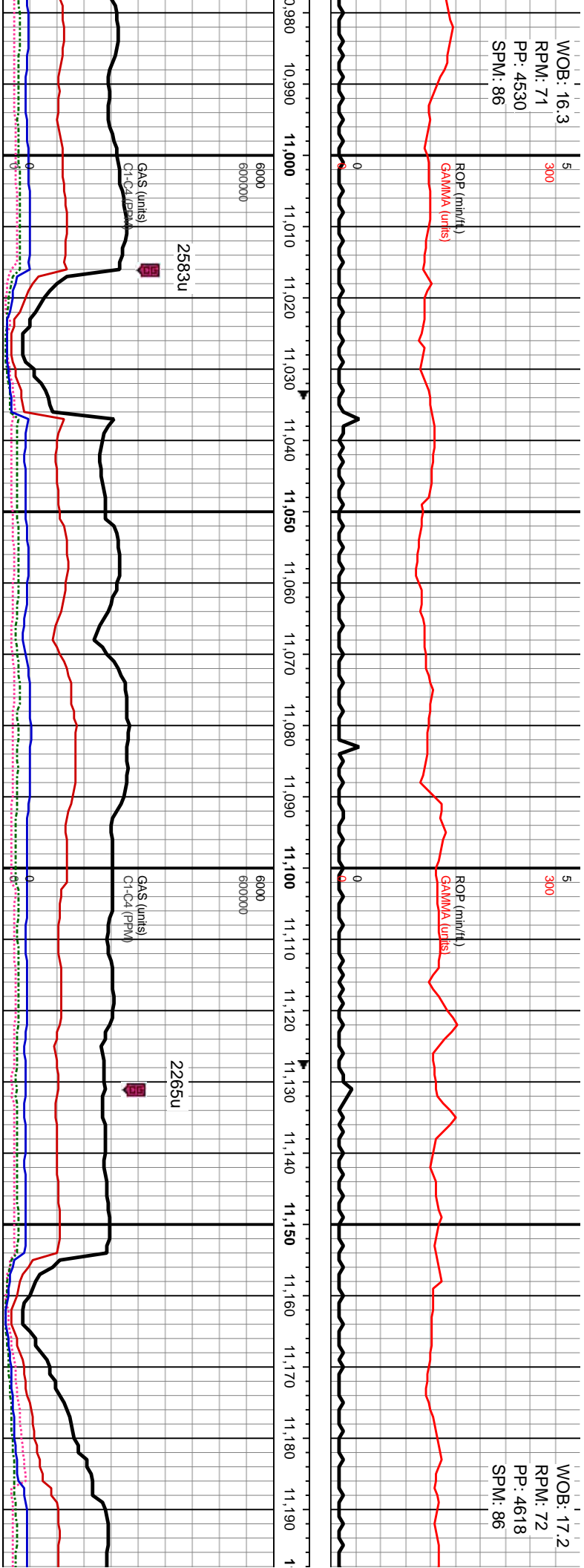
WOB: 16.3  
RPM: 71  
PP: 4530  
SPM: 86

ROP (min/ft)  
GAMMA (units)



WOB: 17.2  
RPM: 72  
PP: 4618  
SPM: 86

ROP (min/ft)  
GAMMA (units)



2583u

Gas (units)  
C1-C4 (PPM)

2265u

Gas (units)  
C1-C4 (PPM)

60% CHK: MED-GRY TO BRN-GY, VF LAM,  
MOT, PLTY-SB BLKY, MOD-FRM, V CALC,  
CRPXLN, 40% MARL: MED-DK GY, VF  
GRND, PLTY-SB PLTY, MOD SFT-MOD  
FRM, SIL. SCAT BENT. TR DULL YEL  
FLOR, V TR MILKY CUT.  
RING.

TVD (ft)

MD: 11.06'  
TVD: 7,082.5'  
Inclination: 90.1°  
Azimuth: 270.1°

60% CHK: MED-GRY TO BRN-GY, VF LAM,  
MOT, PLTY-SB BLKY, MOD-FRM, V CALC,  
CRPXLN, 40% MARL: MED-DK GY, VF  
GRND, PLTY-SB PLTY, MOD SFT-MOD  
FRM, SIL. SCAT BENT. TR DULL YEL FLOR,  
V WK RESDL RING.

TVD (ft)

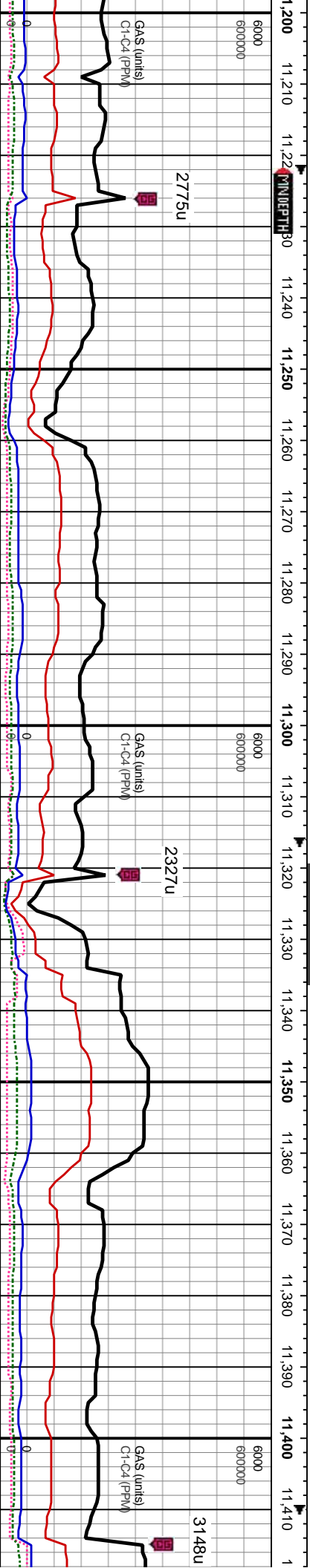
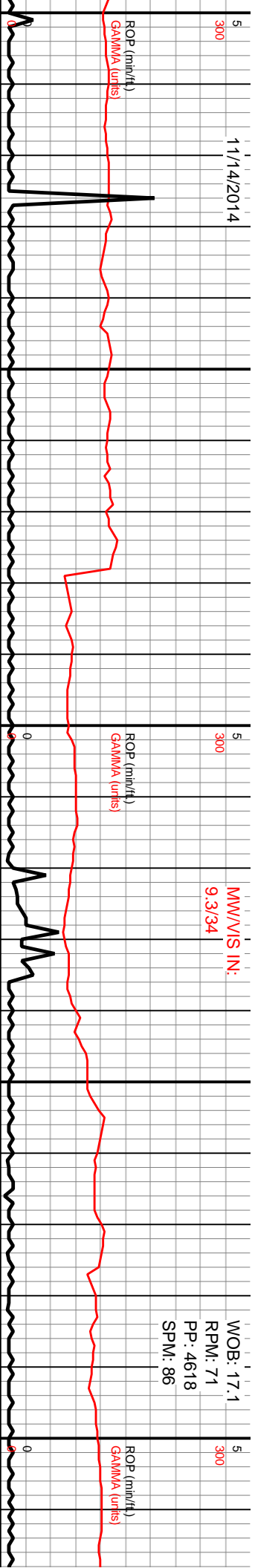
MD: 11.15'  
TVD: 7,081.9'  
Inclination: 90.5°  
Azimuth: 270.4°

60% CHK: MED-GRY TO BRN-GY, VF LAM,  
MOT, V CALC, MOD-FRM, PLTY-SB BLKY,  
CRPXLN, 40% MARL: MED-DK GY, VF GRND,  
MOD SFT-MOD FRM, SB PLTY-PLTY, SIL.  
SCAT BENT. TR DULL YEL FLOR, NO CUT.

7150

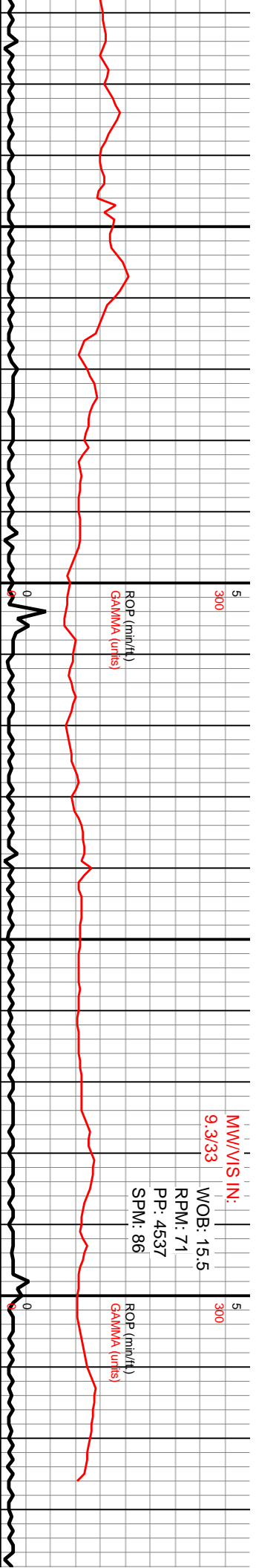
7150





6800	60% CHK: MED-GRY TO BRN-GY, VF LAM, MOT, V CALC, MOD-FRM, PLY-SB BLKY, CRPXLN, 40% MARL: MED-DK GY, VF GRND, MOD SFT-MOD FRM, SB PLY-PLY, SIL, SCAT BENT. TR DULL YEL FLOR, NO CUT. 1% DISS VF GRND PYR.	6800	60% CHK: LT-MED GRV, SWE BRN-GY, VF LAM, MOD-FRM, SB BLKY, CRPXLN, V CALC, 40% MARL: MED-DK GY, VF GRND, SB PLY-PLY, MOD FRM-SL HRD, SIL, SCAT BENT. TR DULL YEL FLOR, MILKY CUT. TR DISS VF GRND PYR.	6800	60% CHK: LT-MED GRV, SWE BRN-GY, VF LAM, MOD-FRM, SB BLKY, CRPXLN, V CALC, 40% MARL: MED-DK GY, VF GRND, SB PLY-PLY, MOD FRM-SL HRD, SIL, SCAT BENT. TR DULL YEL FLOR, MILKY CUT. TR DISS VF GRND PYR.	6800	50% CHK: MED G LAM, V CALC, MC PLY. 50% MARL PLY-PLY, MOD SCAT BENT. TR CUT. 1% VF GRN
TVD (ft)	MD: 11,246' TVD: 7,080.8' Inclination: 90.7° Azimuth: 270.7°	TVD (ft)	MD: 11,342' TVD: 7,080.4' Inclination: 89.7° Azimuth: 270.4°	TVD (ft)		TVD (ft)	
7150		7150		7150		7150	





Thank you for using

## ALS Empirica

TD @ 11693' MD  
@ 02:44 AM ON  
11/14/2014.

Y, VF  
B  
SB  
= GRND,  
V WK  
PYR.

60% CHK, LT-MED GRY, SME BRN GY, VF LAM, V CALQ, MOD SFT-MOD FRM, SB PLTY-PLTY, 40% MARL: MED-DK GY, SB PLTY-SB BLKY, MOD SFT-SL HRD, VF GRND, SIL, SCAB BENT, TR DULL YEL FLOR, V WK MILKY CUT, TR-1% VF GRND DISSM PYR.