



Empirica

Scale: 5" / 100'
Measured Depth Log

Well Name Windsor_LV_C_14-H_Horizontal

Location SEC.14-T6N-R67W

State Colorado

County Weld

Country USA

Rig Number H&P 319

API Number 051233816700

AFE # 14-754

Region DJ Basin

Field Wattenberg

Spud Date 12/8/2014

Ground Elevation 4845'

K.B. Elevation 4895'

Logged Interval 5000

Formation Niobrara C

Type of Drilling Fluid WBM

Operator

Company Extraction Oil & Gas, LLC

Address 1888 Sherman St, Suite 200
Denver, Colorado 80203

Geologist

Name Justin Perry & Geoff Sterling

Company ALS Empirica

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

Other

Logging Start Date 12/10/2014

Zone Color Coding



Rock Types

UNKNOWN	CHERT	SILTSTONE	IGNEOUS
ANHYDRITE	COAL	SANDSTONE	METAMORPHIC
GYPSUM	MARLSTONE	CONGLOMERATE	CEMENT
SALT	CHALK	BRECCIA	SILTY SH
SIDERITE or LIMONITE	SHALE	TILL	SHY SS
LIMESTONE	SHALE GRAY	BENTONITE	
DOLomite	SHALE COLORED	TUFF	

Accessories

F FOSSIL	ARGILLACEOUS	GLAUCONITE	
GASTROPOD	ARGILLITE GRAIN	GYPSIFEROUS	
OOLITE	BENTONITE	HEAVY MINERAL	
OSTRACOD	BITUMENOUS SUBSTANCE	KAOLIN	
BELEMNITE	BRECCIA FRAGMENTS	MARLSTONE	
BIOCLASTIC	CALCAREOUS	MINERAL CRYSTALS	
PELLET	CARBONACEOUS FLAKES	NODULES	
PISOLITE	CHTDK	PHOSPHATE PELLETS	
BRYOZOA	PLANT REMAINS	PYRITE	
CEPHALOPOD	PLANT SPORES	MARLSTONE (CALC) STRG	
CORAL	SCAPHOPOD	MARLSTONE (DOL) STRG	
CRINOID	STROMATOPOROID	SANDY	
ECHINOID	FELDSPAR	SILTY	
FISH	FERRUGINOUS PELLET	SILTY	
FORAMINIFERA	ANHYDRITIC	TUFFACEOUS	
		SILTSTONE STRINGER	

Stringer

ANHYDRITE STRINGER
BENTONITE STRINGER
COAL STRINGER
DOLOMITE STRINGER
GYPSUM STRINGER
LIMESTONE STRINGER
MARLSTONE (CALC) STRG
MARLSTONE (DOL) STRG
SANDSTONE STRINGER
SHALE STRINGER

Other Sym

ORGANIC	FAULT
PINPOINT	FORMATION
DEAD	VUGGY
EVEN	GAS SHOW
QUESTIONABLE	NORMAL FAULT
SPOTTED STAINING	OIL SHOW
BIT	OVERTURNED
CASING	REVERSE FAULT
E EARTHY	SIDEWALL COR
FENESTRAL	CONNECTION GAS
F FRACTURE	SLIDE
INTERCRYSTALLINE	CORE - LOST
INTEROOLITIC	CORE - RECOVERED
MOLDIC	TRIP GAS
	DST INTERVAL
	WIRELINE TEST

Engineering

MN DEPTH	NORMAL FAULT
DEAD	VUGGY
EVEN	GAS SHOW
QUESTIONABLE	NORMAL FAULT
SPOTTED STAINING	OIL SHOW
BIT	OVERTURNED
CASING	REVERSE FAULT
E EARTHY	SIDEWALL COR
FENESTRAL	CONNECTION GAS
F FRACTURE	SLIDE
INTERCRYSTALLINE	CORE - LOST
INTEROOLITIC	CORE - RECOVERED
MOLDIC	TRIP GAS
	DST INTERVAL
	WIRELINE TEST

Abols

WIRELINE TESTED - RT **FX** FINELYXLN

ON TOP



MIN DEPTH

BS GRAINSTONE

L LITHOGRAPHIC

MX MICROXLN

PTH

Rounding

A ANGULAR

MS MUDSTONE

R ROUNDED

PS PACKSTONE

S SUBANG

WS WACKESTONE

T SUBRND

E (LEFT)

Sorting

E (RIGHT)

M MODERATE

Textures

BS BOUNDSTONE

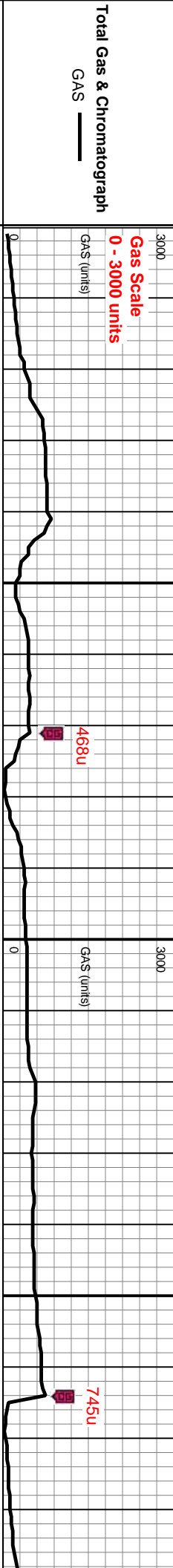
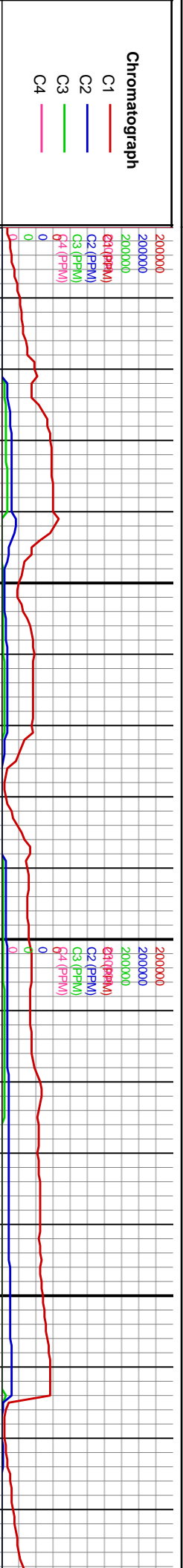
P POOR

C CHALKY

W WELL

CX CRYPTOXLN

ED - LEFT **E** EARTHY

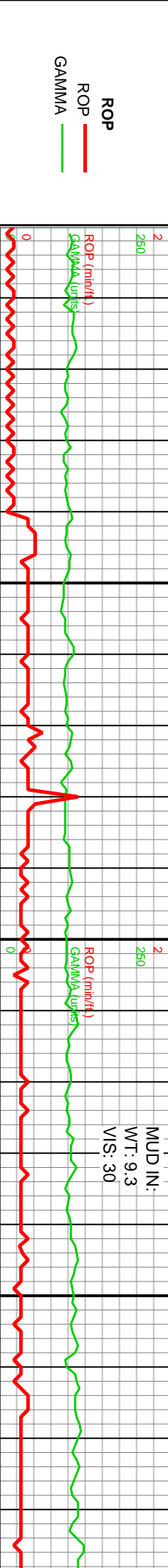
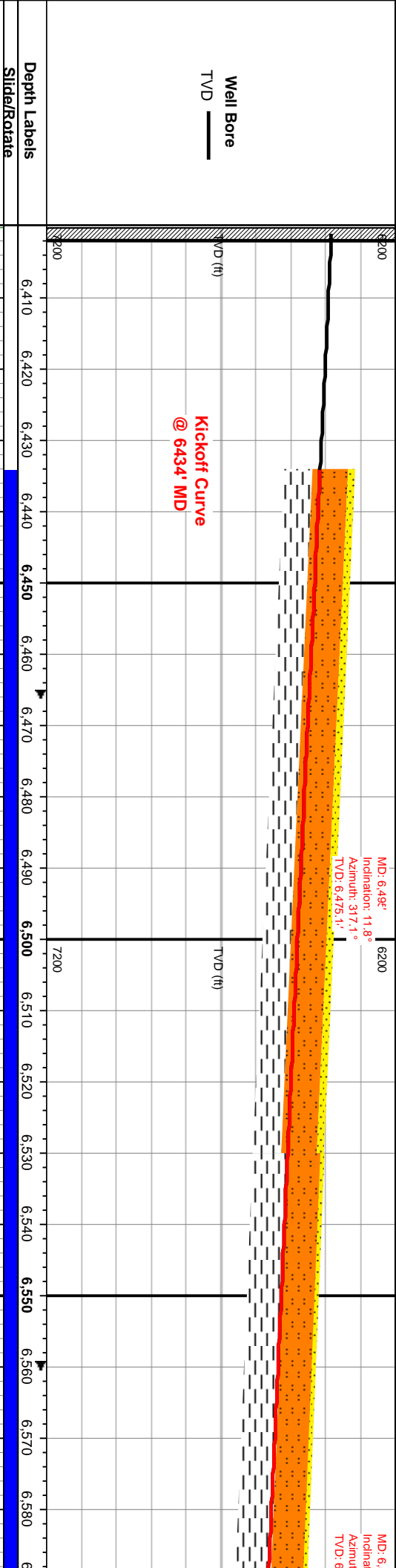


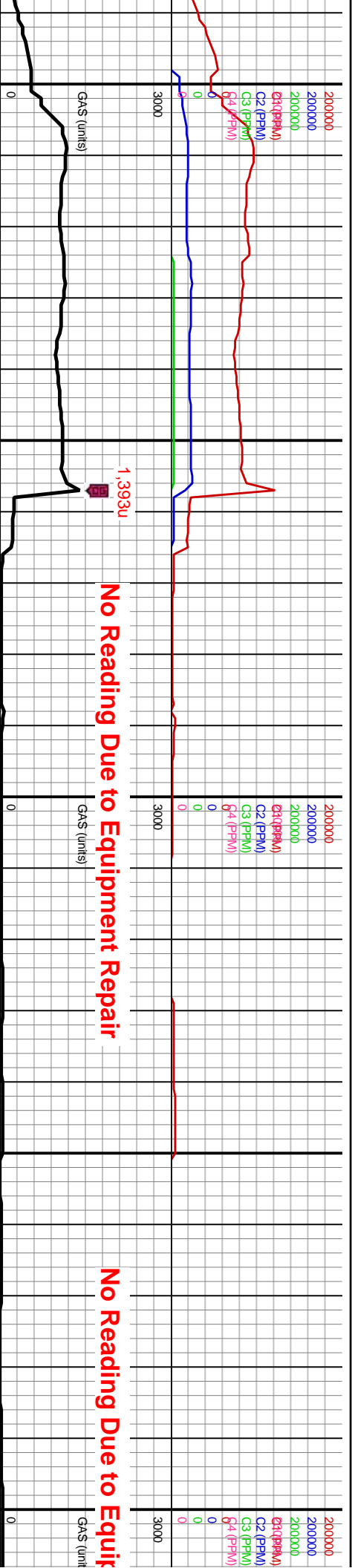
Lithology Descriptions

SLTST: GY - DK GY, PLTY - SB BLKY, MOD FRM - HRD, SLTY TXT, SL CALC. SH: DK GY - GY, MOD FRM - FRM, OCCLY BRIT, PREDY SB PLTY, F LAM. SD: LT GY, RR WH, PRED FRM, BRIT, VF - F GR, SB ANG - SB RND, P - MOD SRTD, ARG MTX, TR GLAU, SL CALC, TR FY DISSM PYR.

SLTST: GY - DK GY, PLTY - SB BLKY, MOD FRM - HRD, SLTY TXT, SL CALC. SH: DK GY - GY, MOD FRM - FRM, OCCLY BRIT, PREDY SB PLTY, F LAM. SD: LT GY, RR WH, PRED FRM, BRIT, VF - F GR, SB ANG - SB RND, P - MOD SRD, ARG MTX, TR GLAU, SL CALC, TR FY DISSM PYR.

SLTST:GY - DK
HRD, SLTY TXT
FRM - FRM, OC
BLKY, F LAM, A
BRIT, VF - F GR
ARG MTX, TR G





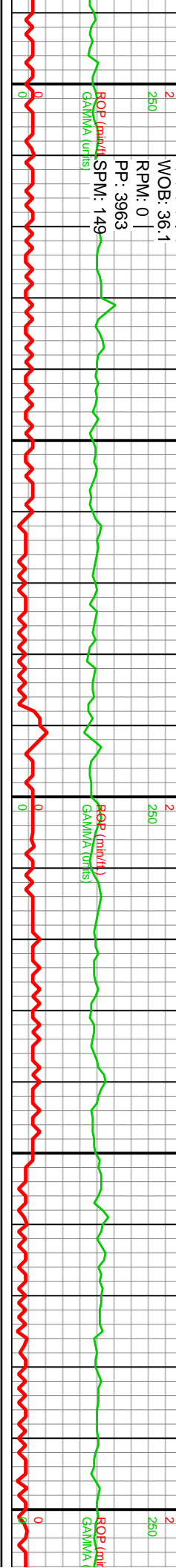
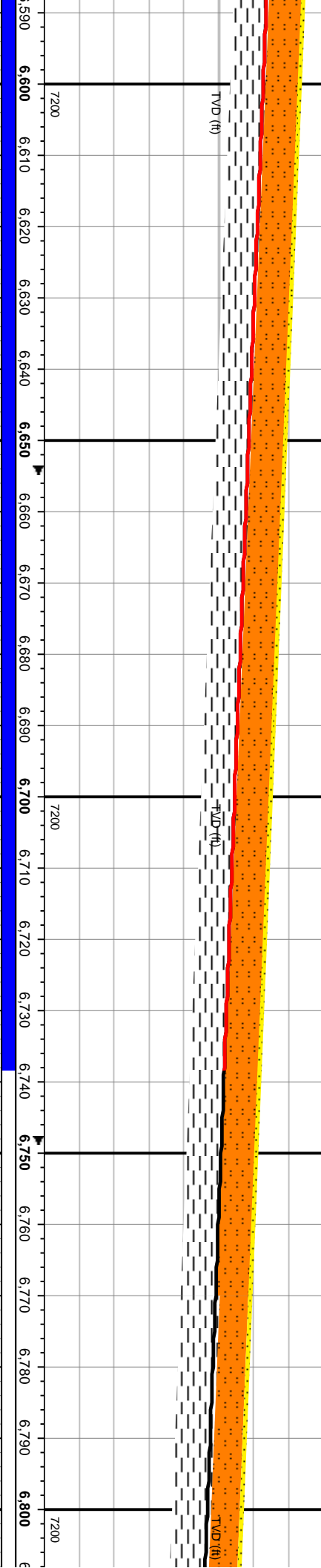
GY, PLTY - SB BLKY, MOD FRM - SLTST: GY - DK GY, PLTY - SB BLKY, MOD FRM - HRD, SLTY TXT, SL CALC. SH: DK GY - GY, MOD FRM - FRM, OCCLY BRIT, PREDY SB PLTY, SME SB BLKY, F LAM, ABNT SLT. SD: LT GY, PRED FRM, BRIT, VF - F GR, SB ANG - SB RND, P - MOD SRTD, ARG MTX, TR GLAU, SL CALC, TR FY DISSM PYR.

SLTST: GY - DK GY, PLTY - SB BLKY, MOD FRM - HRD, SLTY TXT, SL CALC. SH: DK GY - GY, MOD FRM - FRM, OCCLY BRIT, PREDY SB PLTY, SME SB PLTY, SME SB BLKY, F LAM, ABNT SLT. RR SD: LT GY, PRED FRM, BRIT, VF - F GR, SB ANG - SB RND, P - MOD SRTD, ARG MTX, TR GLAU, SL CALC, TR FY DISSM PYR.

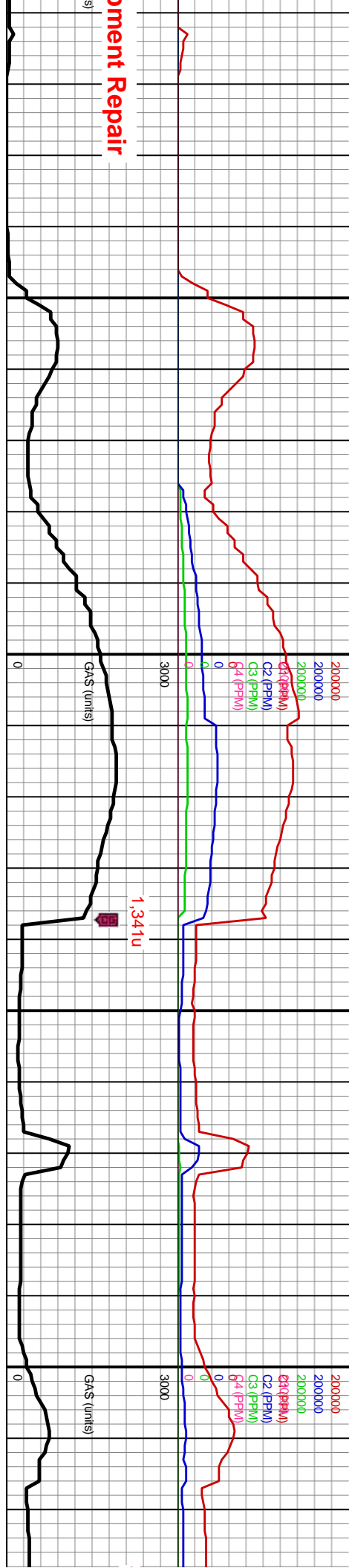


MD: 6.684' Inclination: 38.7° Azimuth: 292.6° TVD: 6,640.9'

MD: 6.776' Inclination: 39.3° Azimuth: 274.2° TVD: 6,714.1'



Document Repair



SLTST: GY - DK GY, PLTY - SB BLKY, MOD FRM - HRD, SLTY TXT, WK CALC. SH: DK GY - GY, MOD FRM - FRM, OCCLY BRIT, PREDY PLTY - SB PLTY, MOD FISS, F LAM, ABNT SLT. SD: LT GY, PRED FRM, BRIT, VF - F GR, SB ANG - SB RND, P - MOD SRD, ARG MTX, TR GLAU, SL CALC. TR FY DISSM PYR.

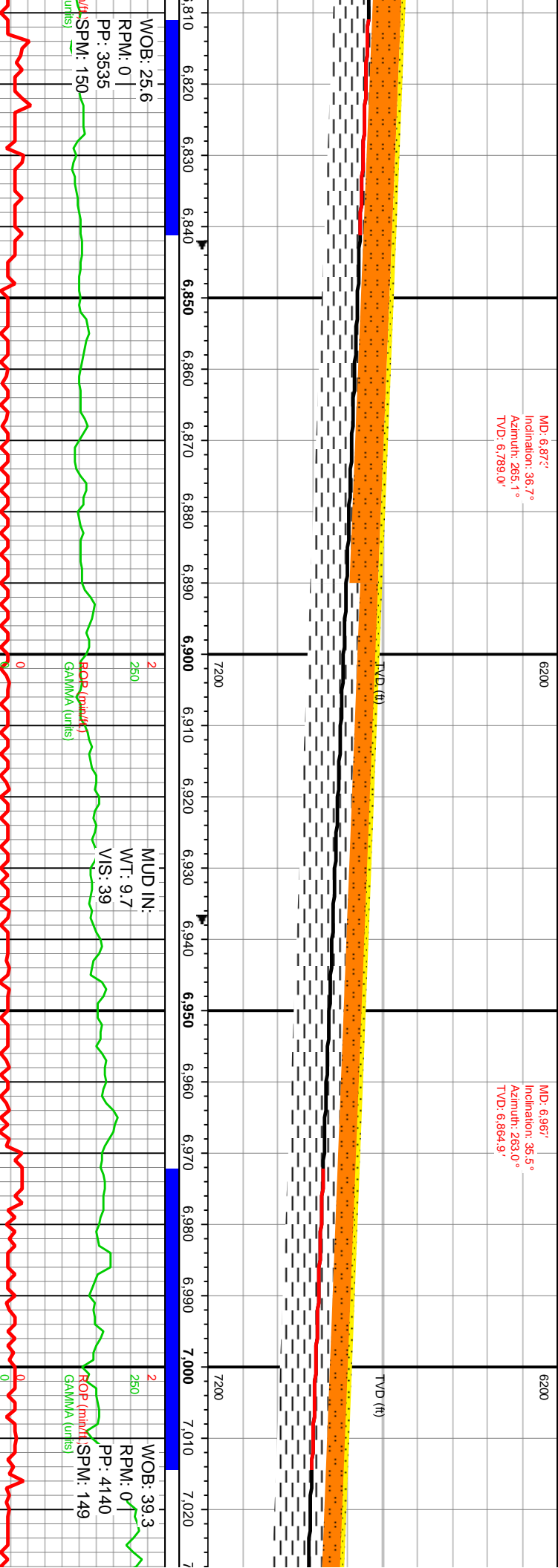
SLTST: DK GY - GY, PLTY - SB BLKY, MOD FRM - HRD, SLTY TXT. SH: DK GY - DK BRN GY, MOD FRM - FRM, OCCLY BRIT, PREDY PLTY - SB PLTY, MOD FISS, F LAM, ABNT SLT. RR SD: LT GY, PRED FRM, BRIT, VF - F GR, SB ANG - SB RND, P - MOD SRD, ARG MTX, TR GLAU. TR FY DISSM PYR.

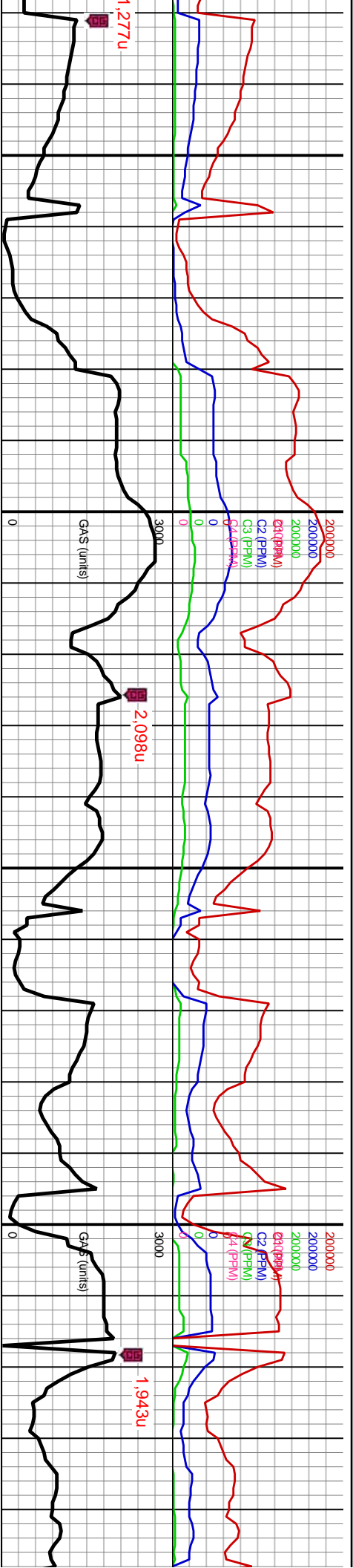
SLTST: DK GY - GY, PLTY - SB BLKY, MOD FRM - HRD, SLTY TXT. SH: DK GY - DK BRN GY, MOD FRM - FRM, OCCLY BRIT, PREDY PLTY - SB PLTY, MOD FISS, F LAM, ABNT SLT. RR SD: LT GY, PRED FRM, BRIT, VF - F GR, SB ANG - SB RND, P - MOD SRD, ARG MTX, TR GLAU. TR FY DISSM PYR.



MD: 6.872'
Inclination: 36.7°
Azimuth: 265.1°
TVD: 6.799.0'

MD: 6.967'
Inclination: 35.5°
Azimuth: 263.0°
TVD: 6.864.9'





CHK: LT GY - GY, SB BLKY - SB PLTY, SFT - FRM, F LAM, MICROXLN, STRONGLY CALC. SLTST: GY - DK GY, SB PLTY, MOD FRM, SLTY TXT. SH: DK GY - DK BRN GY, MOD FRM, OCCLY BRIT, PREDY PLTY - SB PLTY, F LAM. RR SD: LT GY, PRED FRM, BRIT, VF - F GR, SB ANG - SB RND, P - MOD SRTD, TR GLAU. TR FY DISSM PYR.

MARL: MED-DK GY, OCCLY BRN-GY, MOD FRM - SL HRD, OCCLY BRIT, SB PLTY, SME SB BLKY, FY LAM, RAPID HCL RXN. CHK: GY BRN-DK GY, MOD FRM-FRM, PLTY - SB BLKY, RAPID HCL RXN. SH: MED - DK GY, MOD FRM, PLTY - SB PLTY, SL CALC. RR SLTST: GY, SB BLKY, FRM - SL HRD, VF GR. TR DISS VF PYR.

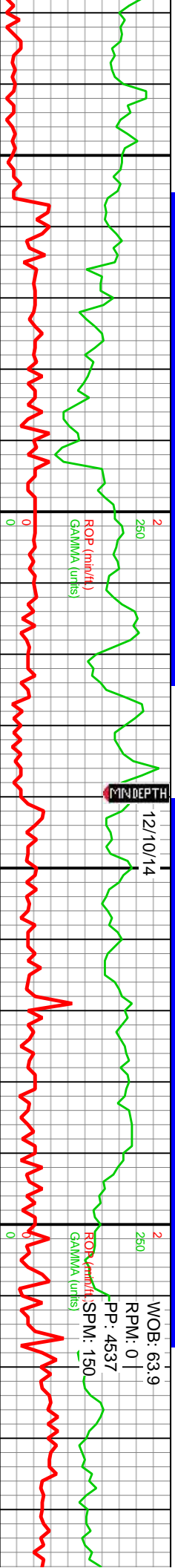
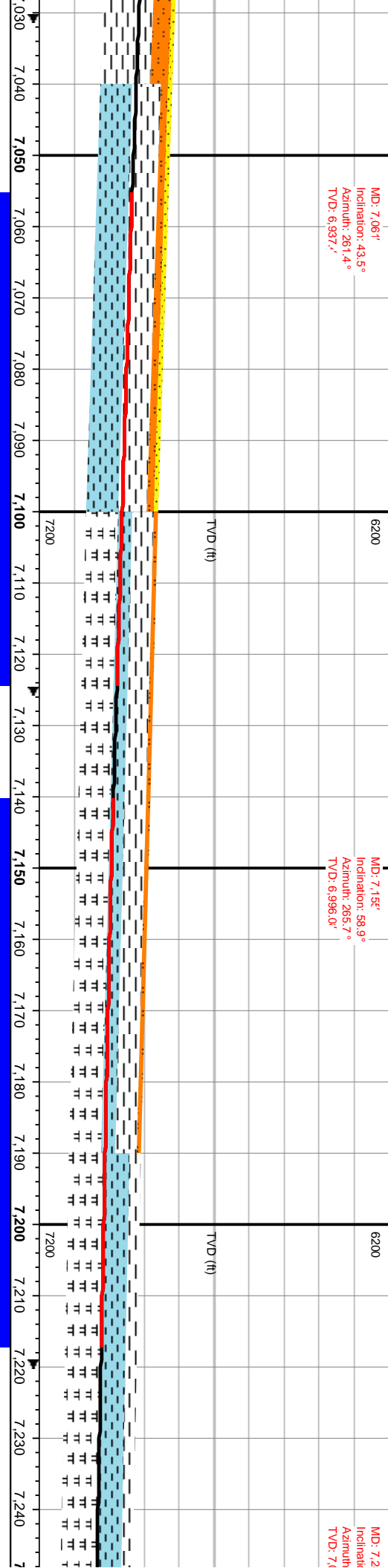
MARL: MED - DK GY, OCCLY BRN-GY, MC FRM - SL HRD, OCCLY BRIT, SB PLTY, SN SB BLKY, FY LAM, RAPID HCL RXN. CHK: BRN-DK GY, MOD SFT - FRM, SB BLKY, R HCL RXN. SH: MED - DK GY, MOD FRM, F SB PLTY, SL CALC. TR DISS VF PYR.

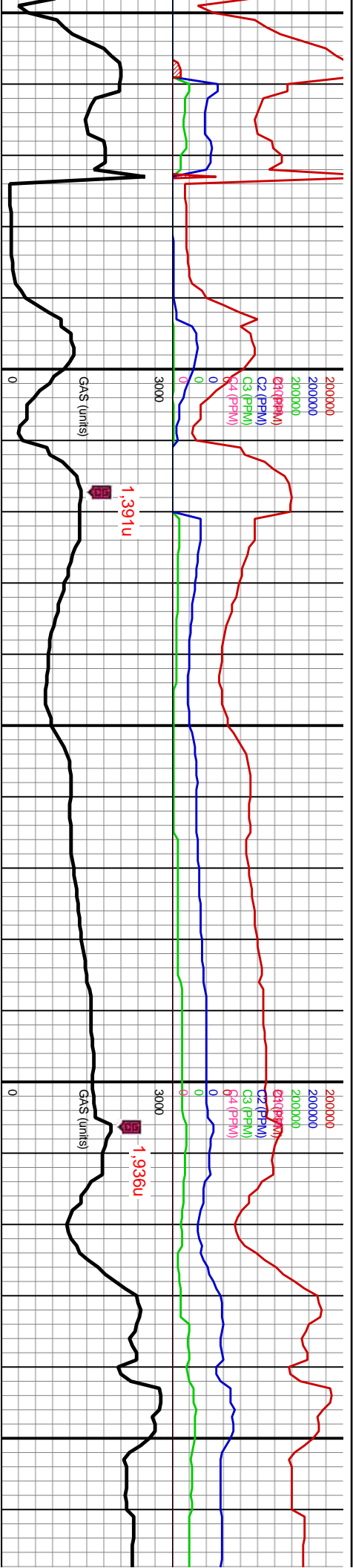


MD: 7.061'
Inclination: 43.5°
Azimuth: 261.4°
TVD: 6.937.7'

MD: 7.152'
Inclination: 58.9°
Azimuth: 265.7°
TVD: 6.996.0'

MD: 7.2
Inclination:
Azimuth:
TVD: 7.4





MARL: MED - DK GY, OCCLY BRN-GY, MOD FRM - SL HRD, OCCLY BRIT, SB PLTY - SB BLKY, FY LAM, RAPID HCL RXN. CHK: GY BRN-DK GY, MOD SFT - FRM, SB BLKY, WH ELG STRGS OF CHK, SLTY, RAPID HCL RXN. SH: MED - DK GY, MOD FRM, PLTY - SB PLTY, SL CALC. TR DISS VF PYR.

MARL: MED - DK GY, OCCLY BRN-GY, MOD FRM - SL HRD, OCCLY BRIT, SB PLTY - SB BLKY, FY LAM, RAPID HCL RXN. CHK: GY BRN-DK GY, MOD SFT - SL HRD, PREDY SB BLKY, WH ELG STRGS OF CHK, SLTY, RAPID HCL RXN. TR SH: MED - DK GY, MOD FRM, PLTY - SB PLTY, SL CALC. TR DISS VF PYR.

MARL: MED - DK GY, OCCLY BRN-GY, MOD FRM - SL HRD, OCCLY BRIT, SB PLTY - SB BLKY, RAPID HCL RXN FY LAM. CHK: GY BRN-DK GY, MOD SFT - SL HRD, PREDY SB BLKY, WH ELG STRGS OF CHK, SLTY, RAPID HCL RXN. TR SD: LT GY - GY, MOD FRM, SB BLKY, MOD SRTD, SB ANG, SL CALC. ARG MTX, TR GLAU. TR DISS VF PYR.

MARL: MED - DK GY, OCCLY BRN-GY, MOD FRM - SL HRD, OCCLY BRIT, SB PLTY - SB BLKY, RAPID HCL RXN FY LAM. CHK: GY BRN-DK GY, MOD SFT - SL HRD, PREDY SB BLKY, WH ELG STRGS OF CHK, SLTY, RAPID HCL RXN. TR SD: LT GY - GY, MOD FRM, SB BLKY, MOD SRTD, SB ANG, SL CALC. ARG MTX, TR GLAU. TR DISS VF PYR.



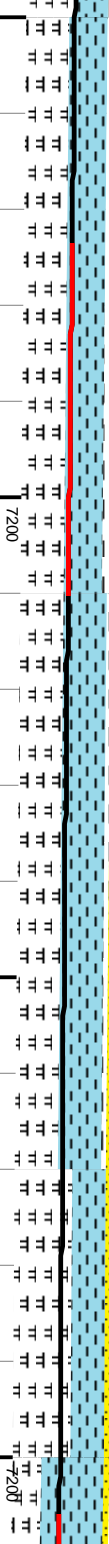
on: 72.5°
Azimuth: 289.1°
TVD: 7.346'

MD: 7.346'
Inclination: 79.3°
Azimuth: 270.9°
TVD: 7.0574'

MD: 7.411'
Inclination: 81.5°
Azimuth: 270.5°
TVD: 7.0686'

TVD (ft)

TVD (ft)



250

2

MUD IN:
WT: 10.1
VIS: 34

WOB: 88.4
RPM: 0
PP: 4466

MUD CHECK IN/OU
WT: 10.4/10.3
VIS: 33/33

ROP (in/hr)
GAMMA (units)

SPM: 150
GAMMA (units)

