



RESERVOIR GROUP

Scale: 5" / 100'

Measured Depth Log

Well Name BEF West 19

Location Section 2, Township 1S, Range 66W

State Colorado

County Adams

Country USA

Rig Number True 33

API Number 05-001-10209

AFE # 10209

Geographic Region Rockies

Field Wattenberg

Spud Date 12/23/2018

Drilling Completed 2/6/2019

Surface Coordinates 2008' FNL & 321' FEL, Sec. 2, T1S, R66W

Latitude: 39.99481, Longitude: -104.7347

Bottom Hole Coordinates 1065' FNL & 460' FWL, Sec. 2, T1S, R66W

Ground Elevation 5,049'

K.B. Elevation 5,076'

Logged Interval 7,350' To 12,244'

Total Depth 12,244'

Formation Niobrara B

Type of Drilling Fluid Water Based Mud

Operator

Company Petro Operating Company, LLC

Address 9033 East Easter Place, Suite 112
Centennial, CO 80112-2105

Petro  **operatin**
Company, LLC

Geologist

Name Michael Domenick

Company Petro Operating Company, LLC

Address 9033 East Easter Place, Suite 112
Centennial, CO 80112-2105

Petro  **operatin**
Company, LLC

Other

Loggers: Byron Pitulski/Greg Diefenbach

Services Provided: 2 Man Logging, Geosteering

Equipment: ML-585

Start Date 02/02/2019

Release Date: 02/06/2019

Job #: 1952RK1902

Zone Color Coding

Oil

Note

Error

Condensate

Core

Water

Gas

Pressure

Seal

Rock Types

UNKNOWN

ANHYDRITE

GYPSUM

SALT

SIDERITE or LIMONITE

LIMESTONE

DOLOMITE

CHERT

COAL

MARLSTONE

CHALK

SHALE

SHALE GRAY

SHALE COLORED

SILTSTONE

SANDSTONE

CONGLOMERATE

BRECCIA

TILL

BENTONITE

TUFF

IGNEOUS

METAMORPHIC

CEMENT

Acc

F FOSSIL

GASTROPOD

ALGAE

AMPHIPORA

BELEMNITE

BIOCLASTIC

BRACHIOPOD

BRYOZOA

CEPHALOPOD

CORAL

CRINOID

ECHINOID

FISH

FORAMINIFERA

ARGILLACEOUS

ARGILLITE GRAY

BENTONITE

BITUMENOUS

BRECCIA FRAG

CALCAREOUS

CARBONACEO

CHTDK

CHTLT

COAL - THIN BR

DOLOMITIC

FELDSPAR

FERRUGINOUS

FERRUGINOUS

Other

OIL SHOW

ORGANIC

PINPOINT

DEAD

EVEN

QUESTIONABLE

SPOTTED STAINING

ENGINEERING

CASING

CONNECTION (LEFT)

CONNECTION (RIGHT)

CONNECTION GAS

CORE - LOST

CORE - RECOVERED

DST INTERVAL

FAULT

OTHER

OV

NO

NC

PRND

G

WI

WI

WI

Accessories

S	GLAUCONITE	
AIN	GYPSIFEROUS	
	HEAVY MINERAL	ANHYDRITE STRINGER
	SUBSTANCE KAOLIN	BENTONITE STRINGER
MENTS	MARLSTONE	COAL STRINGER
	MINERAL CRYSTALS	DOLOMITE STRINGER
S FLAKES	NODULES	GYPSUM STRINGER
	PHOSPHATE PELLETS	LIMESTONE STRINGER
DS	PYRITE	MARLSTONE (CALC) STRG
	SALT CAST	MARLSTONE (DOL) STRG
	SANDY	SANDSTONE STRINGER
	SILICEOUS	SHALE STRINGER
PELLET	SILTY	SILTSTONE STRINGER
S	TUFFACEOUS	

Stringer

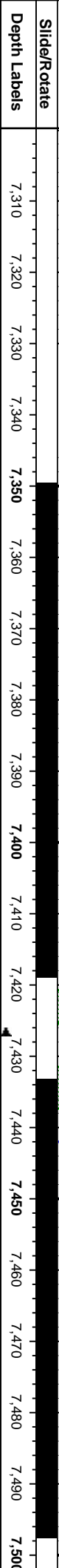
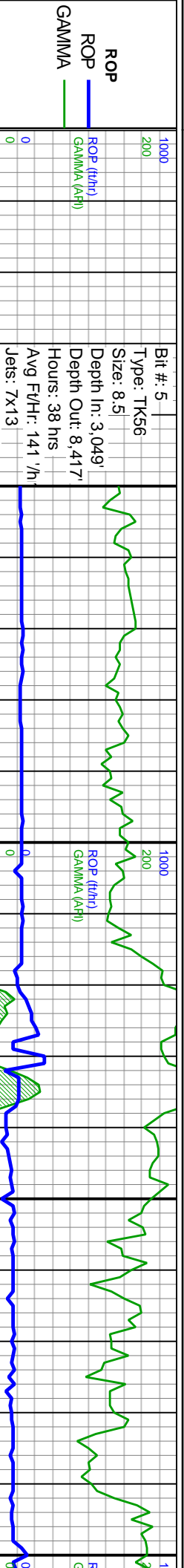
Symbols

FORMATION TOP		L LITHOGRAPHIC
AS SHOW		MX MICROXLN
DEPTH	MIN DEPTH	MS MUDSTONE
ORMAL FAULT	R ROUNDED	PS PACKSTONE
L SHOW	S SUBANG	WS WACKESTONE
VERTURNED STRATA	SUBRND	
VERSE FAULT		
DE WALL CORE (LEFT)		M MODERATE
DE WALL CORE (RIGHT)	B BOUNDSTONE	P POOR
DE	C CHALKY	W WELL
SURVEY	CX CRYPTOXLN	
RIP GAS	E EARTHY	
RELINE TESTED - LEFT	FX FINELYYXLN	
RELINE TESTED - RT	GS GRAINSTONE	

Rounding

Sorting

Textures



Notes

MD: 7,371' INC: 47.3° AZM: 268.9° TVD: 7,168.65' VS: -100.54'

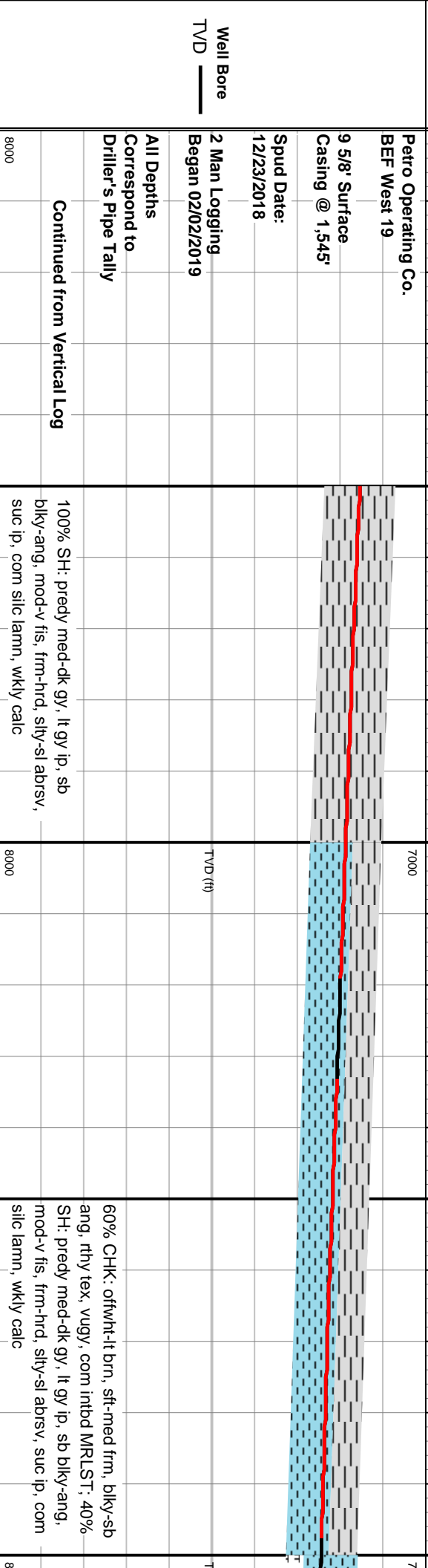
MW IN: 10 VIS IN: 35 MW OUT: 10.1 VIS OUT: .33

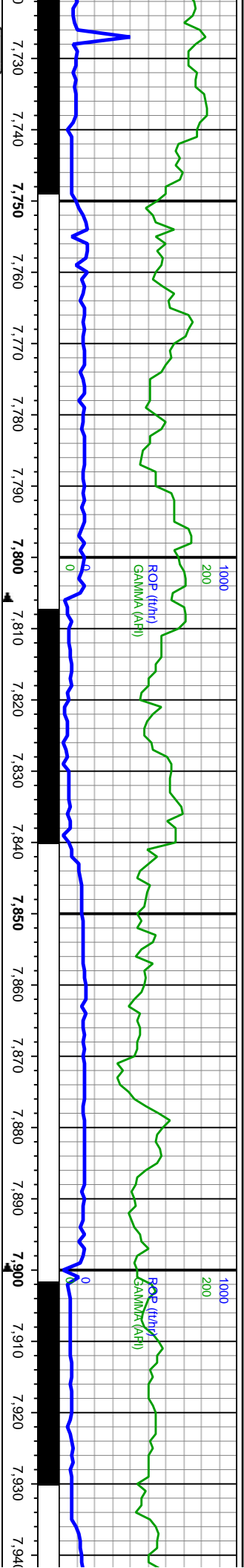
WOB: 20.1klbs RPM: 10 SPM: 169 SPP: 2,844psi

Niobrara A 7,437MD/7,210'TVD

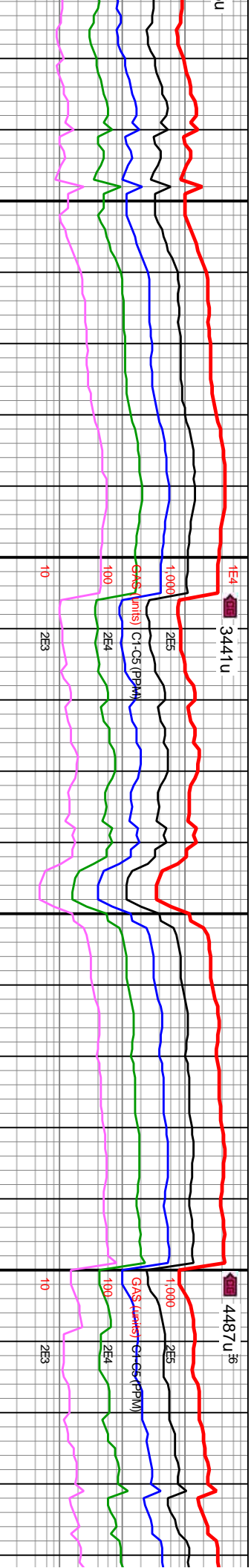
MD: 7,466' INC: 56° AZM: 268.8° TVD: 7,227.54' VS: -28.25'

MW IN: 10+ VIS IN: 35 MW OUT: 10.1 VIS OUT: .33

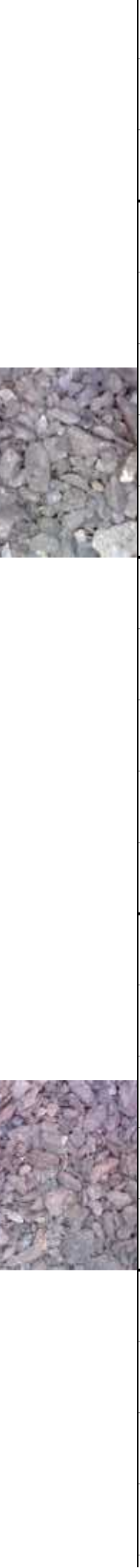


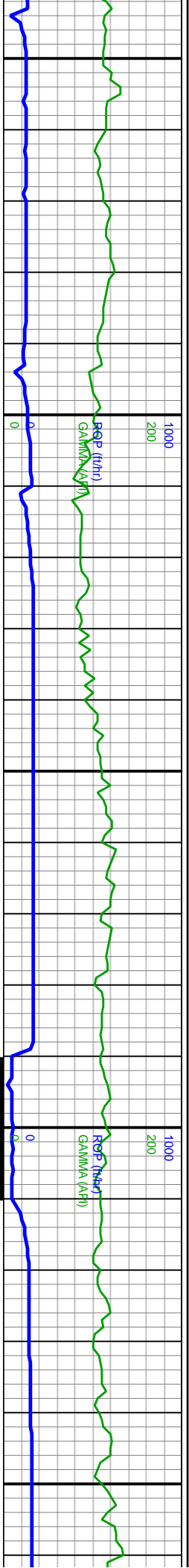


Niobrara B
30°MD/7,324°TVD
MD: 7,750' INC: 79.5° AZM: 270° TVD: 7,328.63' VS: 227.88'
WOB: 34.5kibs RPM: 30 SPM: 171 SPP: 3,326psi
MW IN: 10 VIS IN: 35 MW OUT: 10 VIS OUT: 34
MD: 7,844' INC: 84.3° AZM: 270.9° TVD: 7,341.87' VS: 318.83'
BP 7,930°MD/7,348°TVD
MW IN: 9.9 VIS IN: 33 MW OUT: 9.8 VIS OUT: 32



60% MRLST: dk gry-gy, frm-fri, amor, fy lam
chk incl, dissil, tr forams, v hi calc; 40%
CHK: ofwht-it brn, sft-med frm, blkysb ang,
rthy tex, vugy, com intbd MRLST
75% CHK: ofwht-it brn, sft-med frm, blkysb
ang, rthy tex, vugy, sme intbd MRLST; 25%
MRLST: predy dk gry-gy, frm-fri, amor, fy lam
chk incl, dissil, tr forams, v hi calc





D: 7,939' INC: 88.1° AZM: 268.4° S: 411.18'

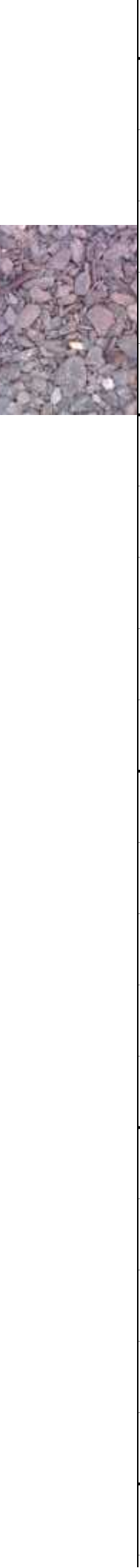
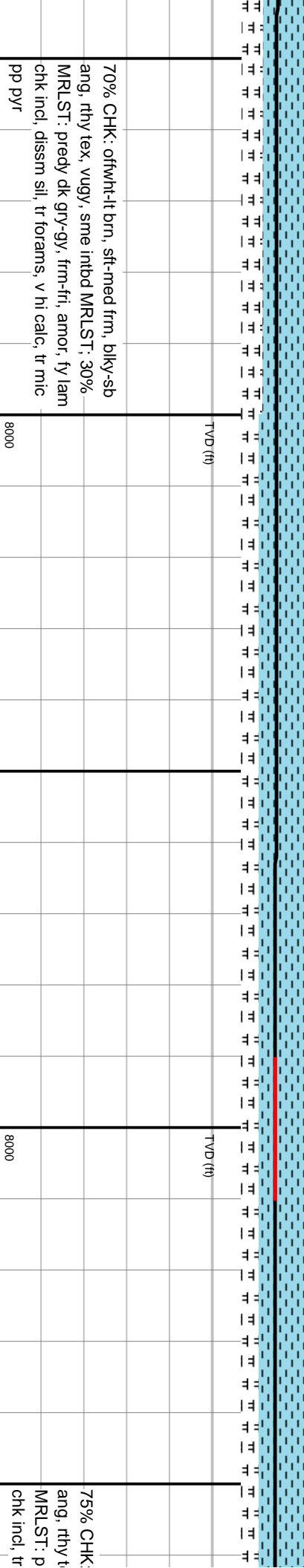
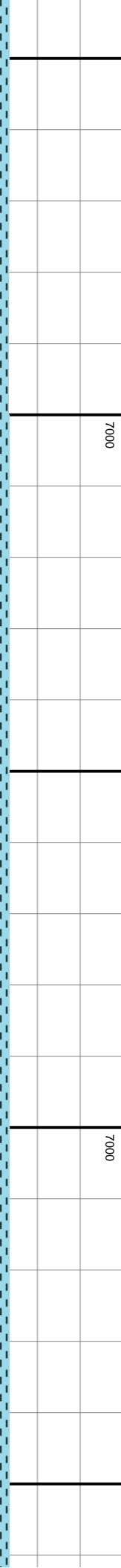
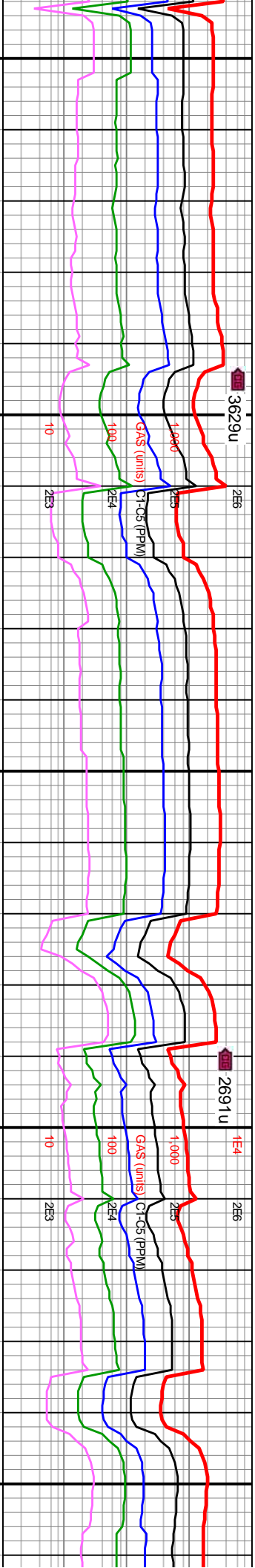
WOB: 24klbs RPM: 61 SPM: 172 SPP: 3.016psi

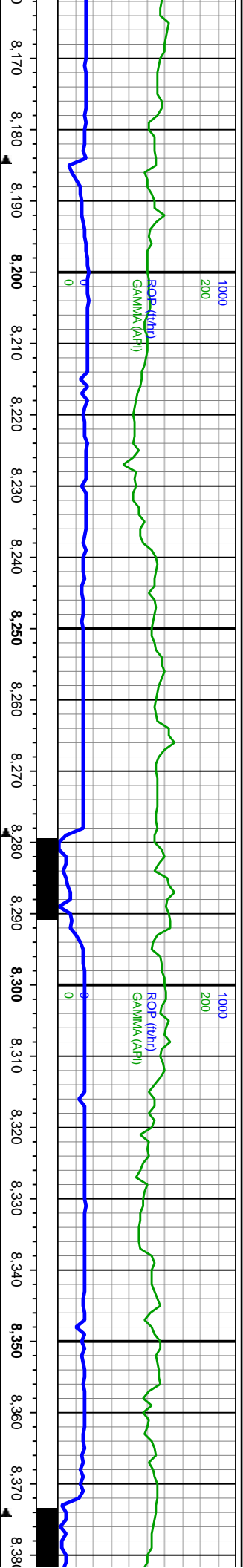
MD: 8.034' INC: 88.1° AZM: 267.9° TVD: 7.351.32' VS: 503.13'

MW IN: 10+ VIS IN: 35 MW OUT: 10.1 VIS OUT: 36

MW IN: 9.9 VIS IN: 38 MW OUT: 9.9+ VIS OUT: 35

MD: 8.128' INC: 90.5° AZM: 269.6° TVD: 7.352.46' VS: 594.38'





MW IN: 9.9+
VIS IN: 38
MW OUT: 10+
VIS OUT: 35

WOB: 29kbs
RPM: 60
SPM: 172
SP: 3,153psi

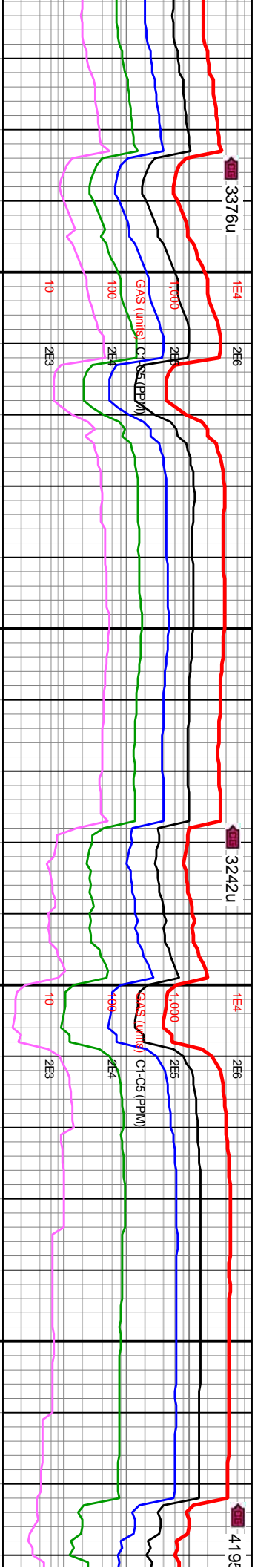
MD: 8,223'
INC: 91.4°
AZM: 269.6°
TVD: 7,350.89'
VS: 686.93'

MW IN: 9.9
VIS IN: 36
MW OUT: 9.9+
VIS OUT: 36

MD: 8,318'
INC: 91.4°
AZM: 270.9°
TVD: 7,348.57'
VS: 779.7'

MW IN: 10
VIS IN: 47
MW OUT: 10.1
VIS OUT: 37

WOB: 3
RPM: 6
SPM: 1
SP: 3,



TVD (ft)

TVD (ft)

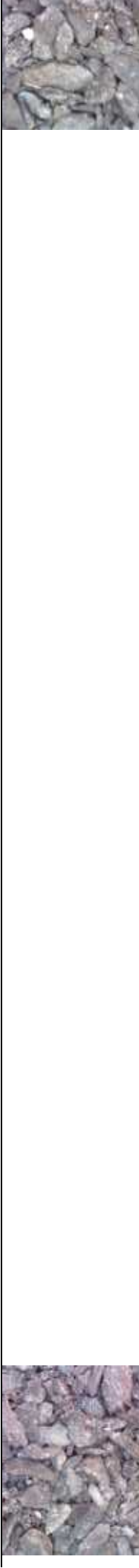
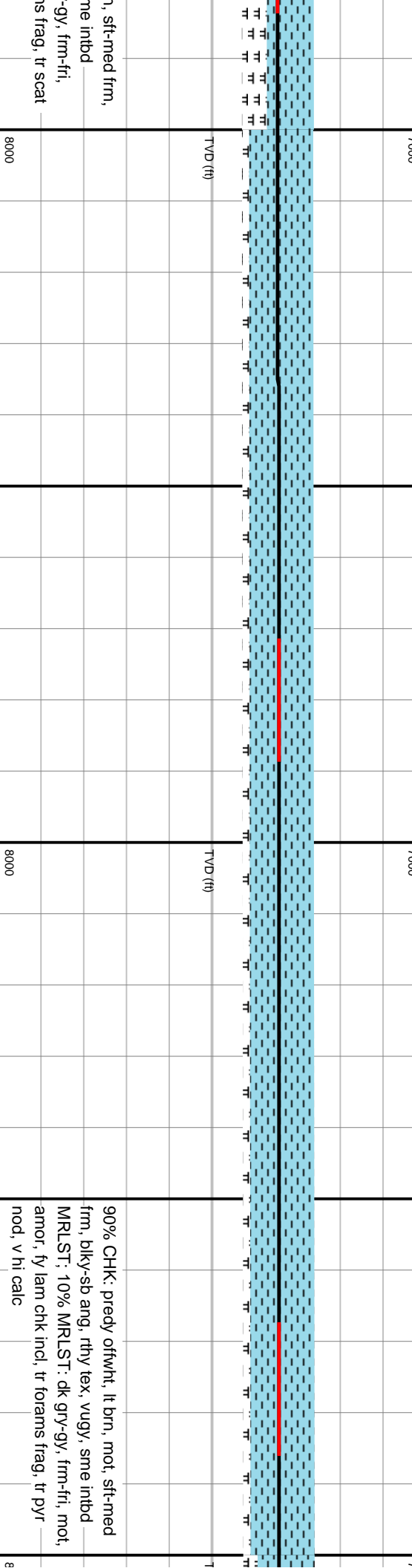
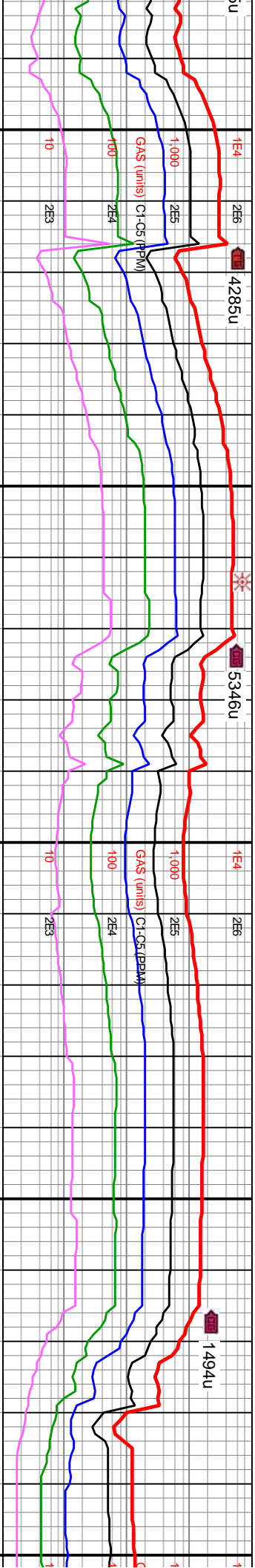
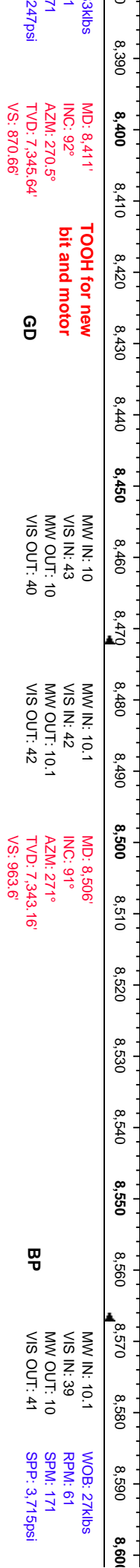
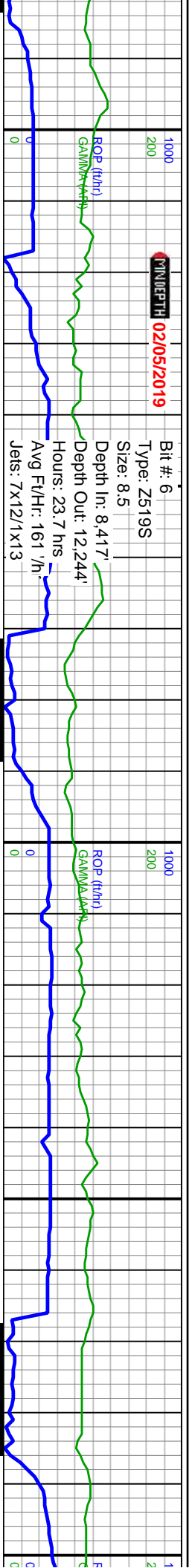
offwh-t brn, sft-med frm, blk-sb
ex, vugy, sme intbd MRLST; 25%
predy dk gry-gy, frm-fri, amor, fy lam
forams frag, hi calc

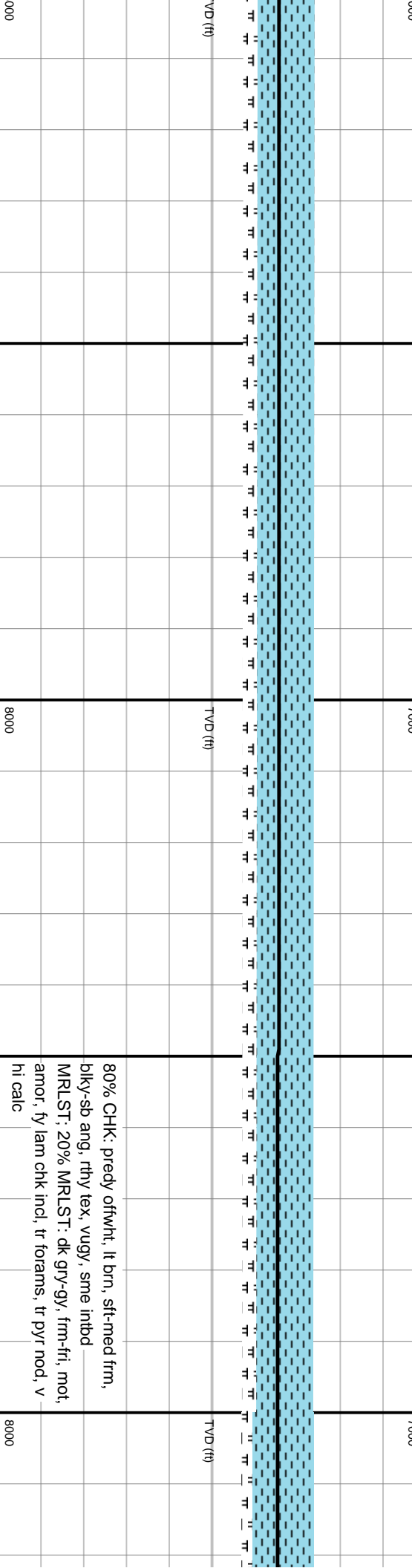
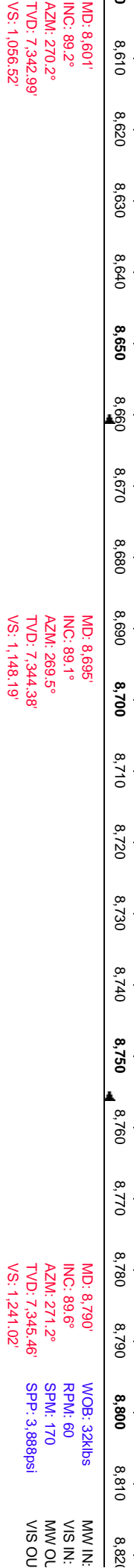
8000

8000

65% CHK: predy oftwht, lt br
blk-sb ang, rthy tex, vugy, s
MRLST; 35% MRLST: dk gry
amor, fy lam chk incl, tr foran
pyr nod, v hi calc

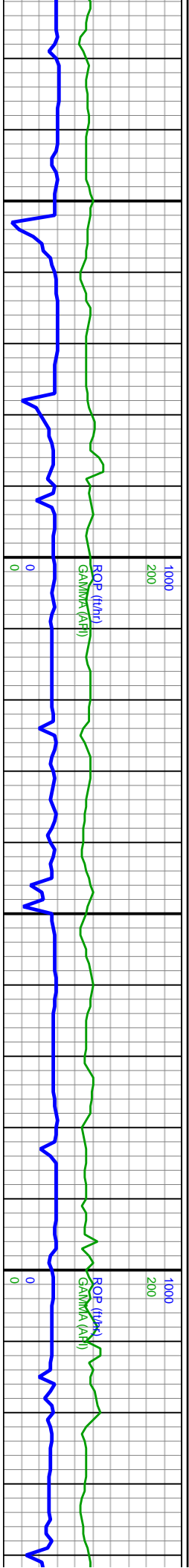






80% CHK: predy offtwnt, lt brn, sft-med frm, blyk-sb ang, rthy tex, vugy, sme inbtbd MRLST; 20% MRLST: dk gry-gy, frm-fri, mot, amor, fy lam chk incl, tr forams, tr pyr nod, v hi calc



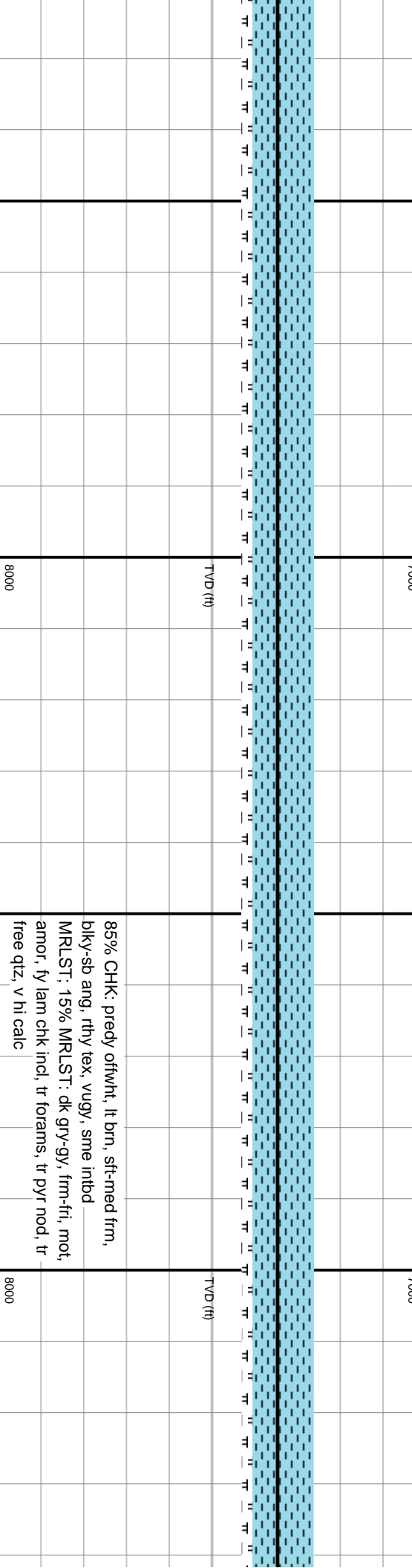
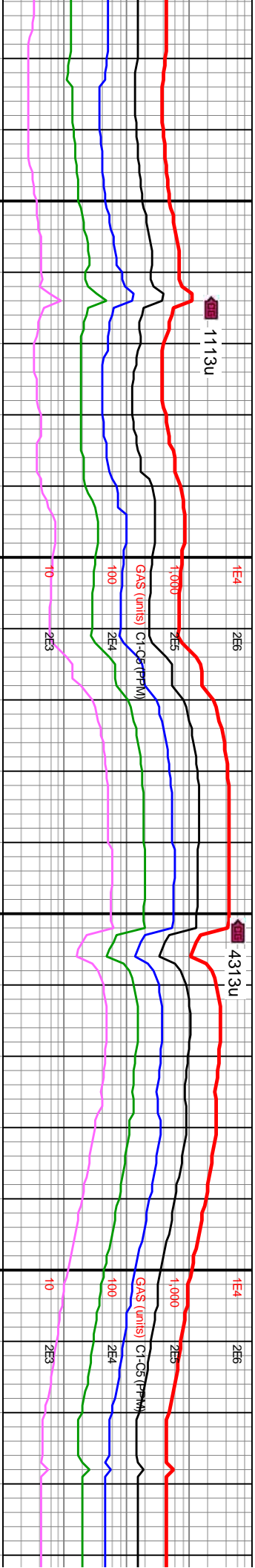


10.1+
41
T: 9.9
T: 40

MD: 8,884'
INC: 89.4°
AZM: 272.4°
TVD: 7,346.28'
VS: 1,333.35'

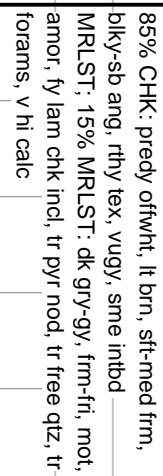
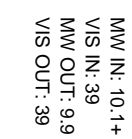
MD: 8,979'
INC: 89.2°
AZM: 274°
TVD: 7,347.44'
VS: 1,427.06'

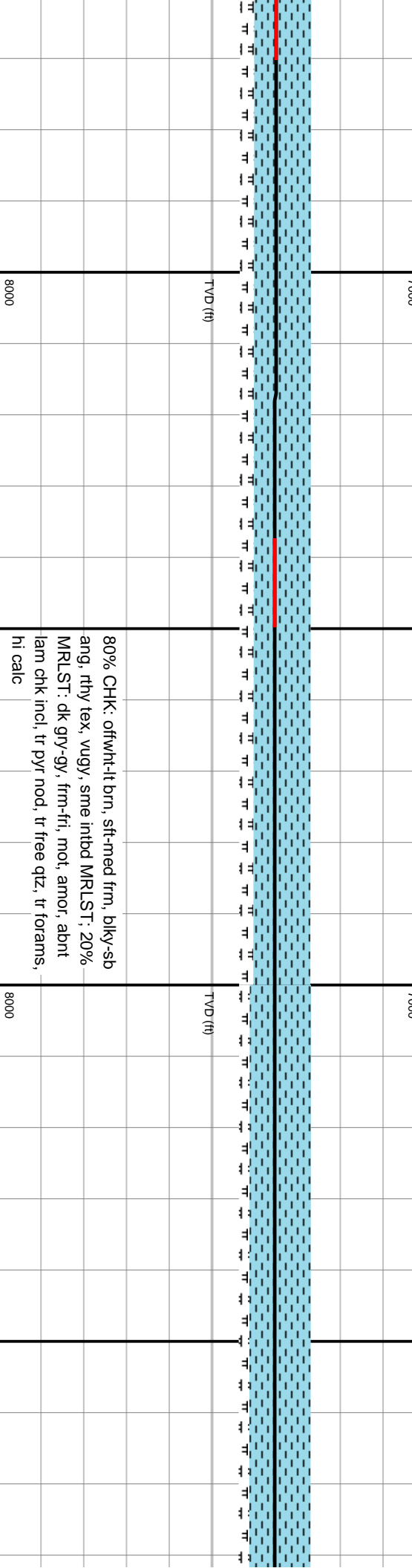
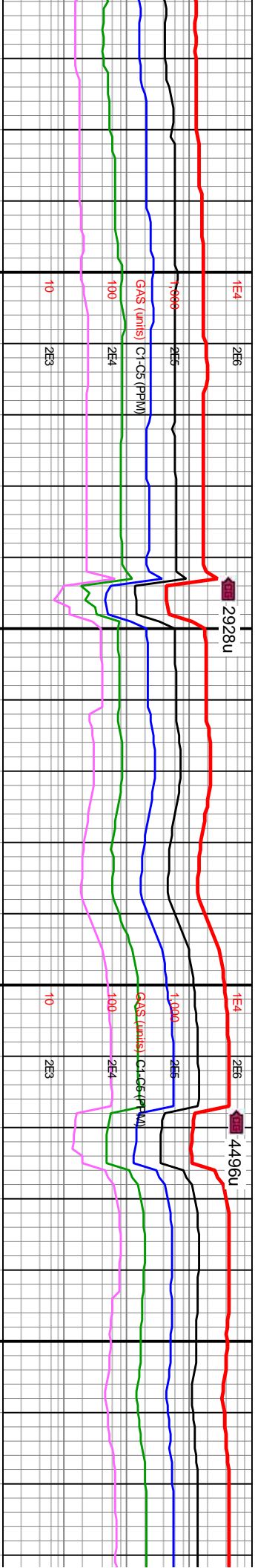
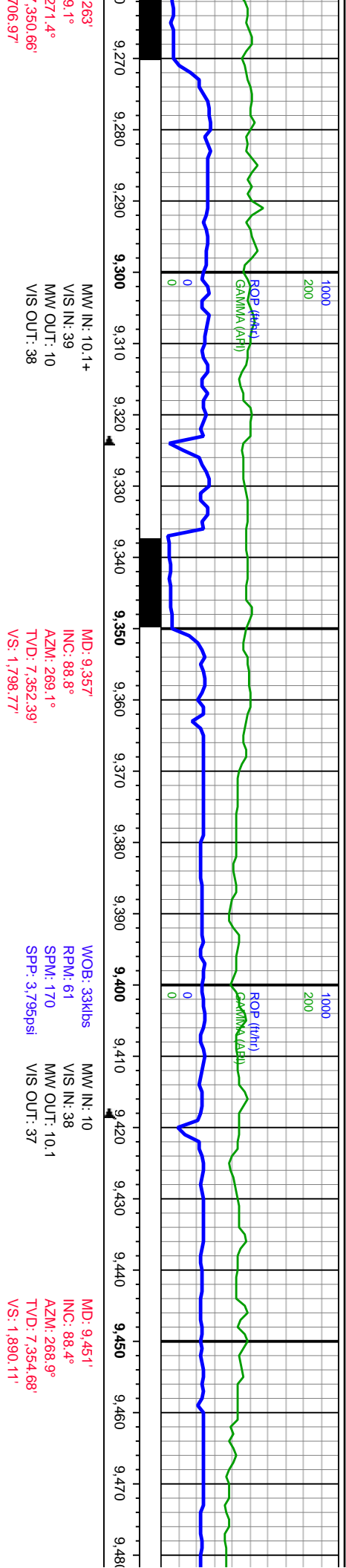
WOB: 31klbs
RPM: 61
SPM: 171
SPP: 3,844psi

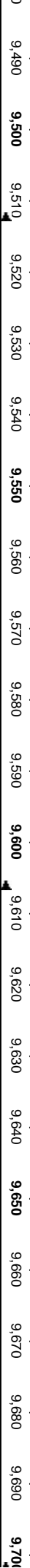
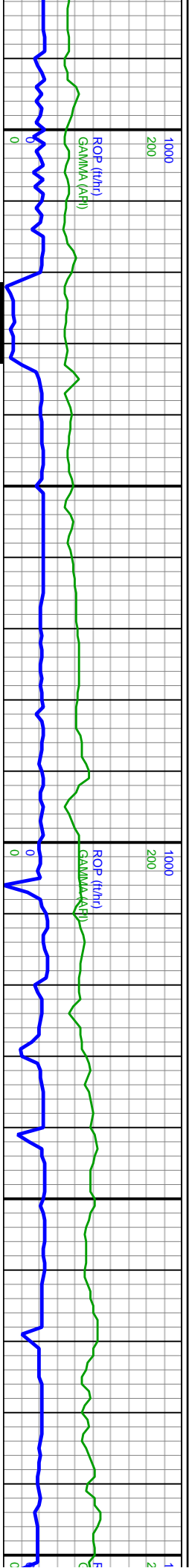


85% CHK: predy offtwht, lt brn, sft-med frm,
biky-sb ang, rthy tex, vugy, sme inthd
MRLST: 15% MRLST: dk gry-gy, frm-fri, mot,
amor, fy lam chk incl, tr forams, tr pyr nod, tr
free qtz, v hi calc





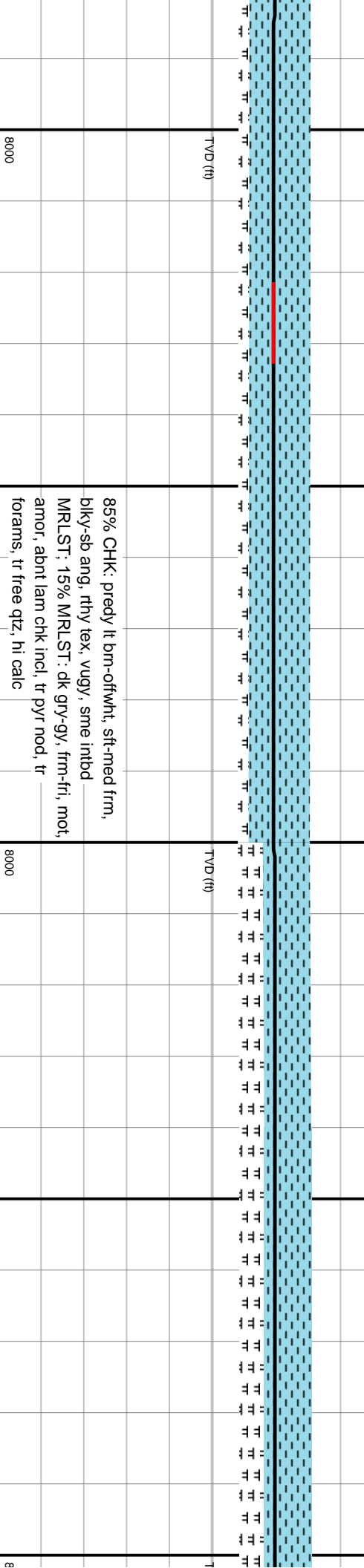
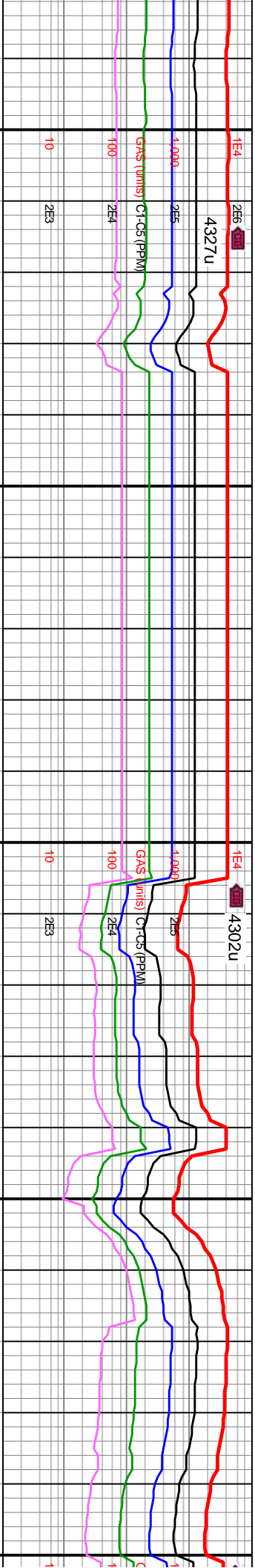




MD: 9,545'
INC: 90.5°
AZM: 269.5°
TVD: 7,365.59'
VS: 1,981.54'

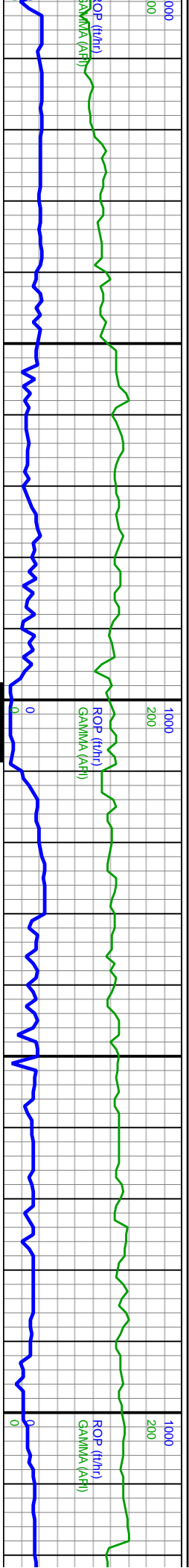
MD: 9,640'
INC: 90.7°
AZM: 269.5°
TVD: 7,364.59'
VS: 2,074.06'

MW IN: 10
VIS IN: 39
MW OUT:
VIS OUT:



85% CHK: predy lt bm-offwht, sft-med frm,
bkly-sb ang, rthy tex, vugy, sme intbd
MRLST: 15% MRLST: dk gry-gy, frm-fri, mot,
amor, abnt lam chk incl, tr pyr nod, tr
forams, tr free qtz, hi calc





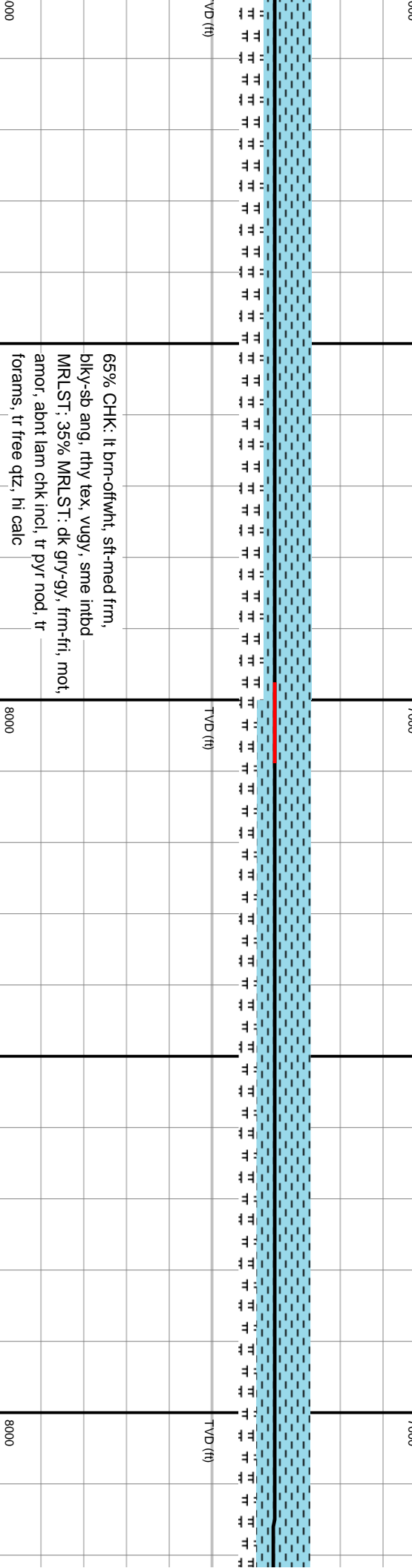
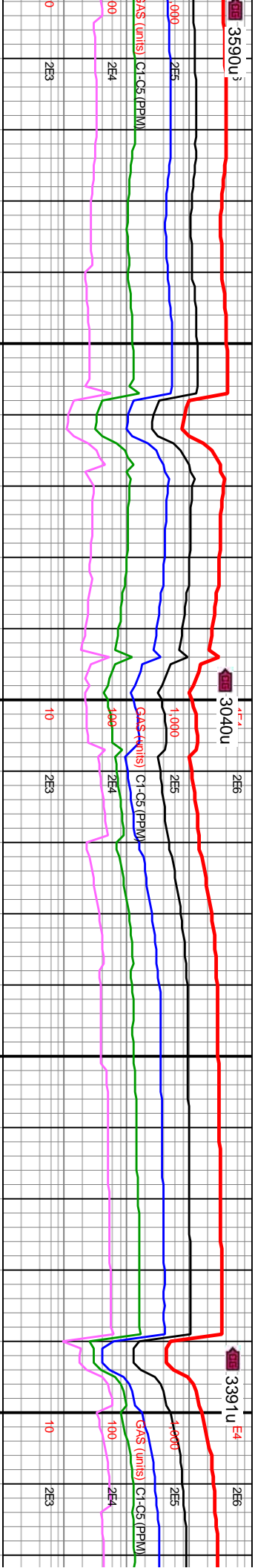
MD: 9,735'
INC: 90.7°
AZM: 268.8°
TVD: 7,363.43'
VS: 2,166.45'

WOB: 24.4kbs
RPM: 18
SPM: 170
SPP: 3,177psi

MD: 9,830'
INC: 89.2°
AZM: 269.8°
TVD: 7,363.51'
VS: 2,258.87'

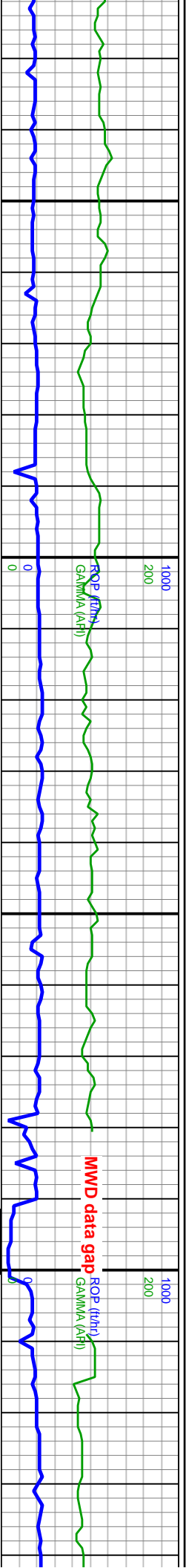
MW IN: 10.2+
VIS IN: 40
MW OUT: 10.1+
VIS OUT: 39

GD



65% CHK: lt brn-offwht, sft-med frm,
blky-sb ang, rthy tex, vugy, sme intbd
MRLST; 35% MRLST; dk gry-gy, frm-fri, mot,
amor, abnt lam chk incl, tr pyr nod, tr
forams, tr free qtz, hi calc





9,930 9,940 9,950 9,960 9,970 9,980 9,990 10,000 10,010 10,020 10,030 10,040 10,050 10,060 10,070 10,080 10,090 10,100 10,110 10,120 10,130 10,14

9,924' 269.5° 7,356.15' 350.47'

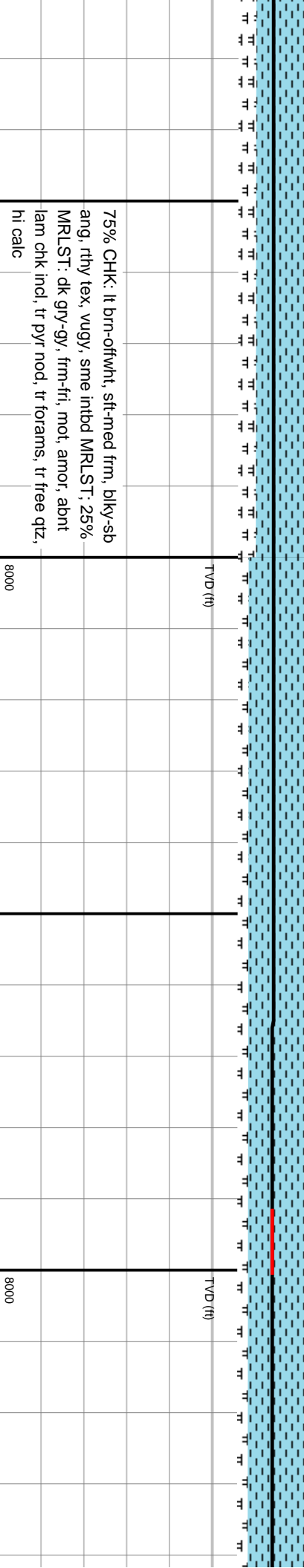
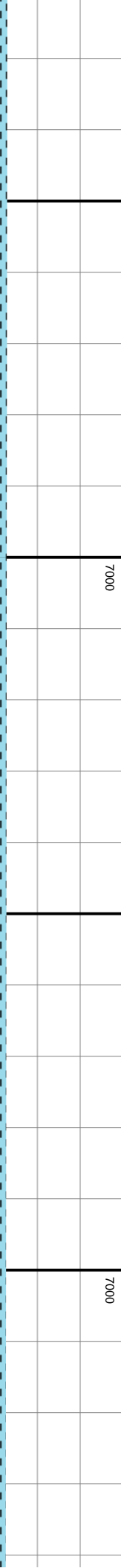
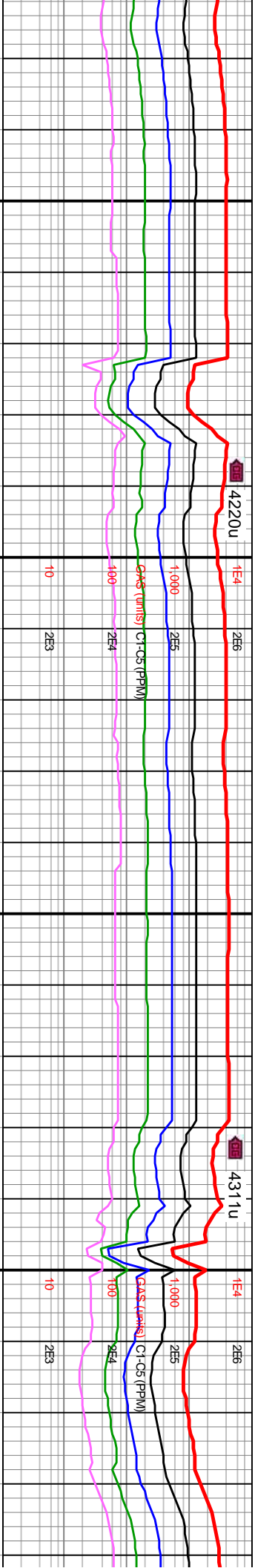
MW IN: 10.1+
VIS IN: 40
MW OUT: 10.2
VIS OUT: 40

WOB: 32.2kibs
RPM: 60
SPM: 169
SPP: 3,945psi

MD: 10.019'
INC: 88.4°
AZM: 269.3°
TVD: 7,357.47'
VS: 2,442.93'

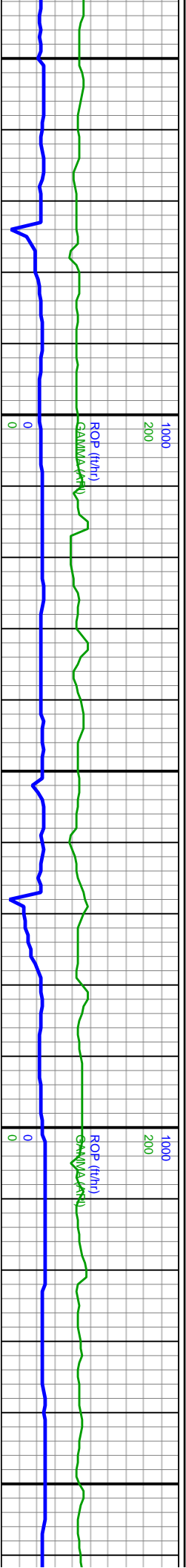
MW IN: 10.2
VIS IN: 40
MW OUT: 10.2+
VIS OUT: 41

MD: 10.113'
INC: 89.5°
AZM: 269.6°
TVD: 7,359.2'
VS: 2,534.45'



75% CHK: lt brn-offwht, sft-med frm, blk-y-sb
ang, rthy tex, vugy, sme intbd MRLST; 25%
MRLST: dk gry-gy, frm-fri, mot, amor, abnt
lam chk incl, tr pyr nod, tr forams, tr free qtz,
hi calc





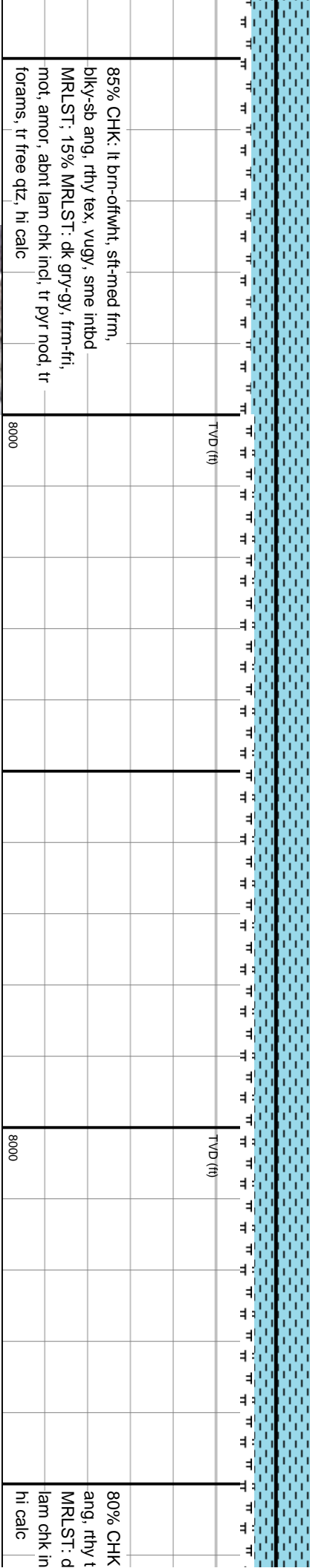
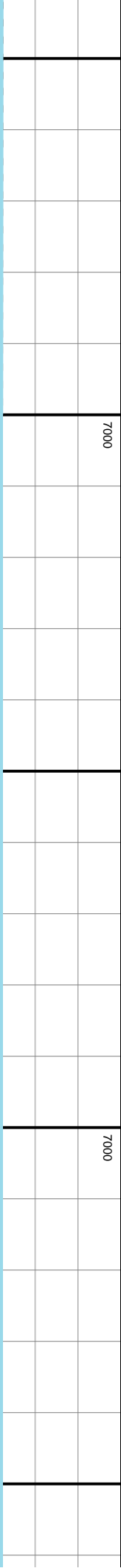
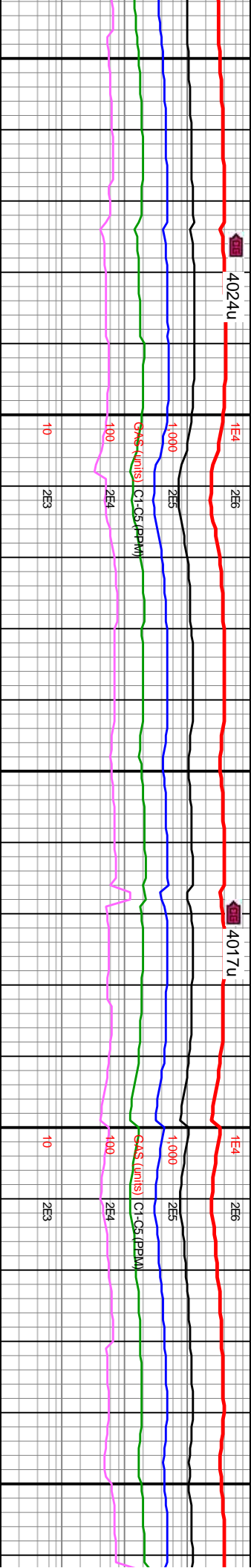
WOB: 31.6kibs
RPM: 60
SPM: 168
SPP: 4,007psi

MD: 10,208'
INC: 89.6°
AZM: 270.2°
TVD: 7,359.94'
VS: 2,627.12'

MW IN: 10.2
VIS IN: 41
MW OUT: 10.2+
VIS OUT: 41

MD: 10,303'
INC: 89.6°
AZM: 270.3°
TVD: 7,360.61'
VS: 2,719.92'

MW IN: 10.2
VIS IN: 41
MW OUT: 10.2
VIS OUT: 41



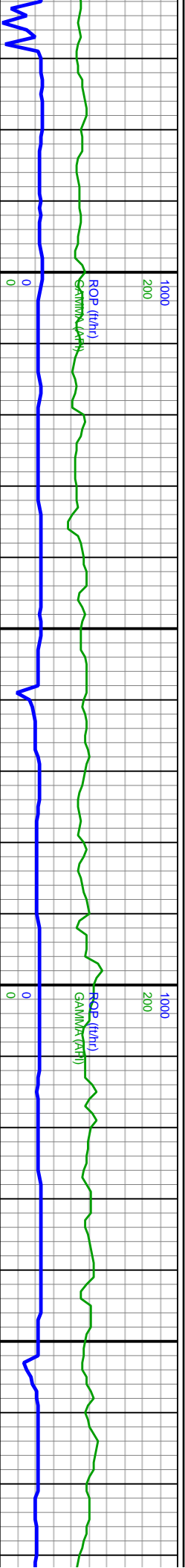
85% CHK: lt brn-offwht, sft-med frm, blk-y-sb ang, rthy tex, vugy, sme intbd MRLST: dk gry-gy, frm-fri, mot, amor, abnt lam chk incl, tr pyr nod, tr forams, tr free qtz, hi calc

8000

8000

80% CHK: ang, rthy t MRLST: d lam chk in hi calc





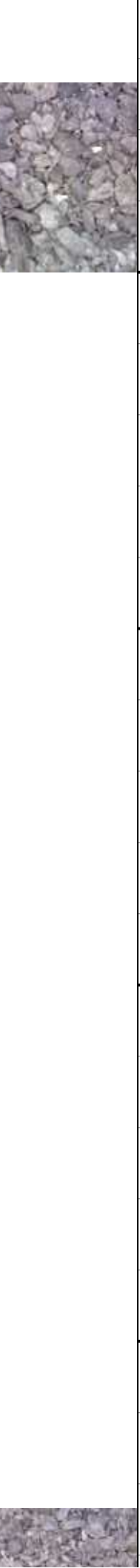
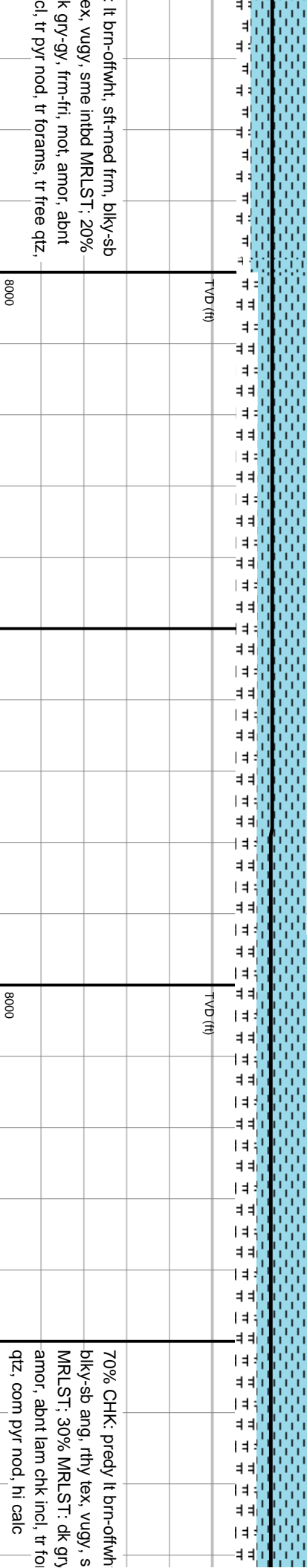
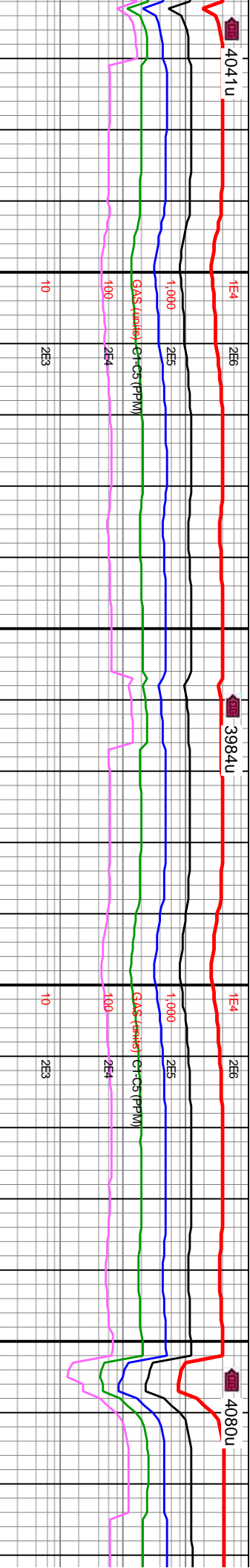
MD: 10,398'
INC: 89.8°
AZM: 270.9°
TVD: 7,361.1'
VS: 2,812.84'

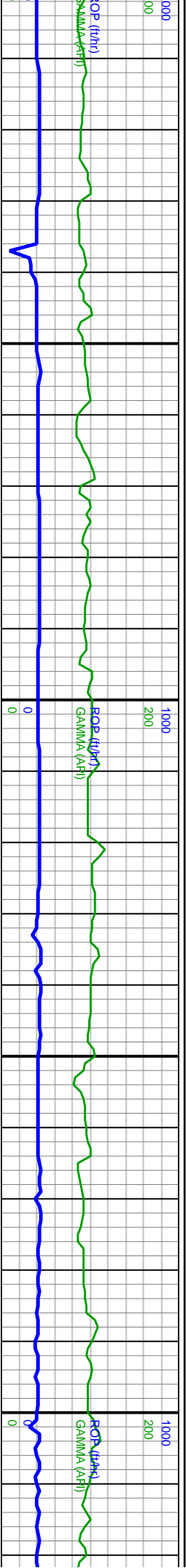
WOB: 29.9kbs
RPM: 60
SPM: 169
SPP: 3,923psi

MD: 10,493'
INC: 89.4°
AZM: 270.5°
TVD: 7,361.77'
VS: 2,905.8'

MW IN: 10.2
VIS IN: 42
MW OUT: 10.2+
VIS OUT: 42

MD: 10,550'
INC: 88.3°
AZM: 27°
TVD: 7,399'
VS: 2,99'





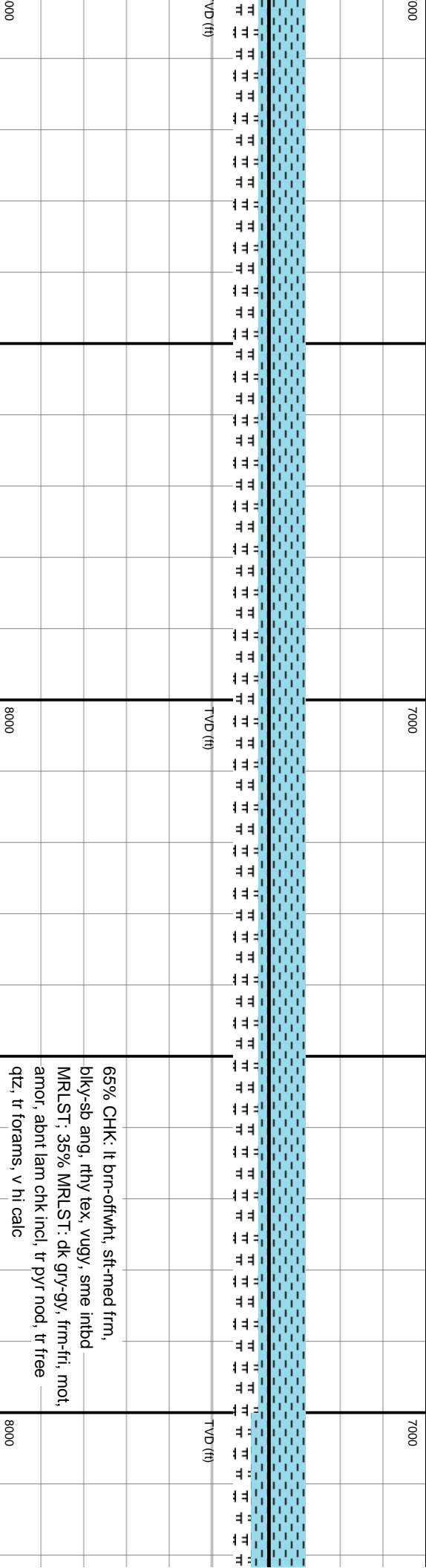
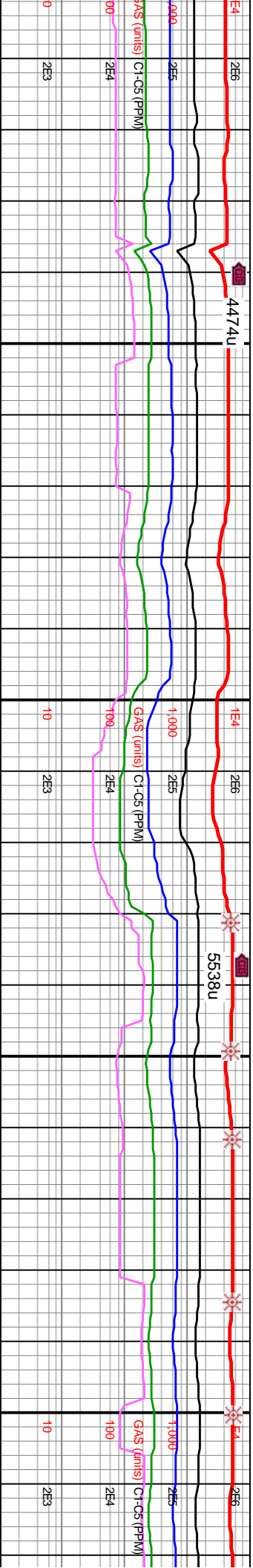
2kbs
MW IN: 10.2
VIS IN: 40
MW OUT: 10.2+
VIS OUT: 41

MD: 10,872'
INC: 90°
AZM: 269.5°
TVD: 7,366.56'
VS: 3,275.19'

MW IN: 10.2+
VIS IN: 40
MW OUT: 10.2+
VIS OUT: 41

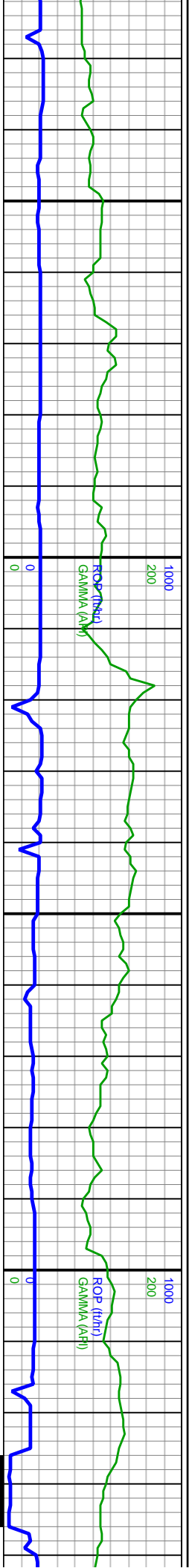
MD: 10,966'
INC: 90.3°
AZM: 269.8°
TVD: 7,366.31'
VS: 3,366.8'

WOB: 33.7kbs
RPM: 60
SPM: 170
SPP: 3,992psi



65% CHK: lt brn-offwht, sft-med frm,
blky-sb ang, rthy tex, vugy, sme intbd
MRLST; 35% MRLST: dk gry-gy, frm-fri, mot,
amor, abnt lam chk incl, tr pyr nod, tr free
qtz, tr forams, v hi calc





11,030 11,040 11,050 11,060 11,070 11,080 11,090 11,100 11,110 11,120 11,130 11,140 11,150 11,160 11,170 11,180 11,190 11,200 11,210 11,220 11,230 11,24

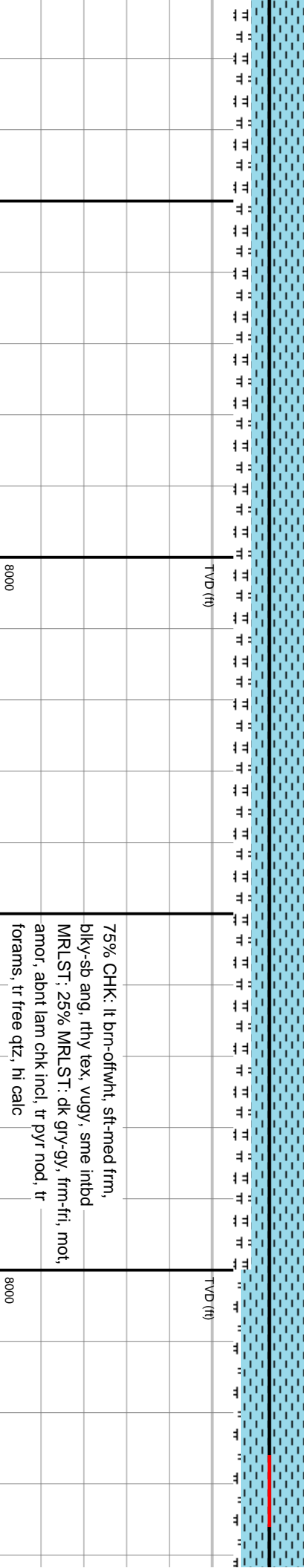
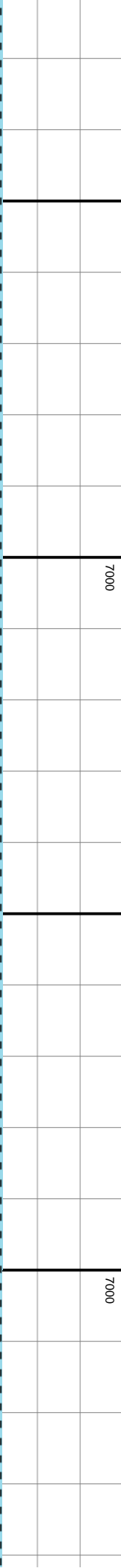
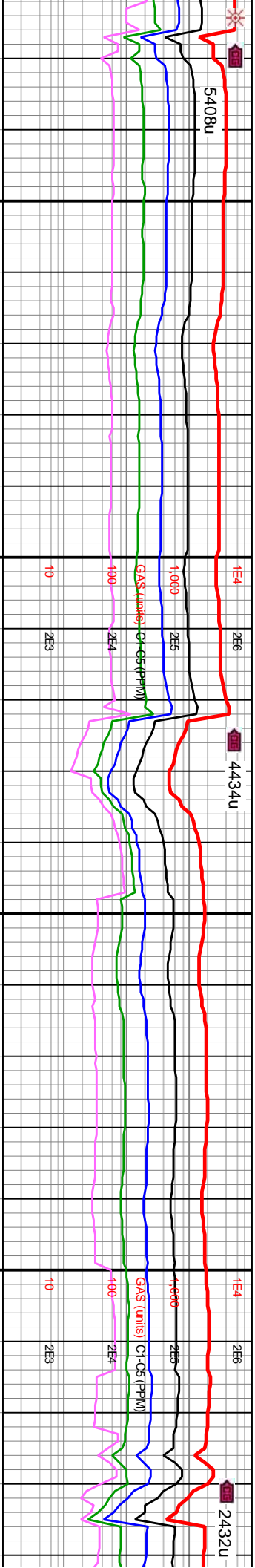
MD: 11,061'
INC: 89.3°
AZM: 269.6°
TVD: 7,366.15'
VS: 3,459.4'

MW IN: 10.2+
VIS IN: 40
MW OUT: 10.3
VIS OUT: 41

MD: 11,156'
INC: 89.3°
AZM: 269.6°
TVD: 7,366.81'
VS: 3,551.96'

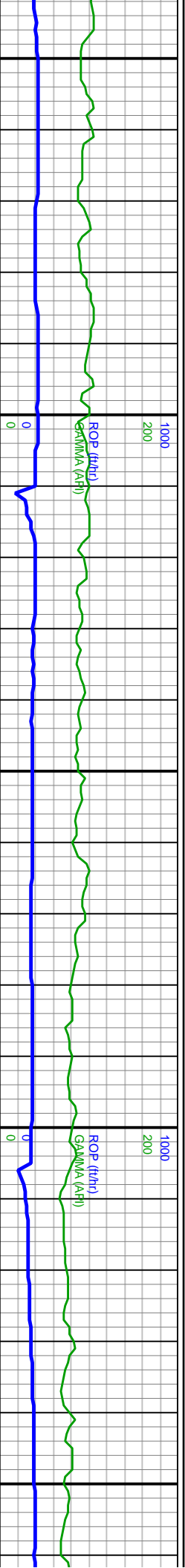
WOB: 25.7klbs
RPM: 60
SPM: 170
SPP: 3,869psi

MW IN: 10.2+
VIS IN: 38
MW OUT: 10.3
VIS OUT: 40



75% CHK: lt brn-offwht, sft-med frm, blkly-sb ang, rthy tex, vugy, sme intbd MRLST; 25% MRLST: dk gry-gy, frm-fri, mot, amor, abnt lam chk incl, tr pyr nod, tr forams, tr free qtz, hi calc





MD: 11,250'
INC: 90.1°
AZM: 268.9°
TVD: 7,367.3'
VS: 3,643.42'

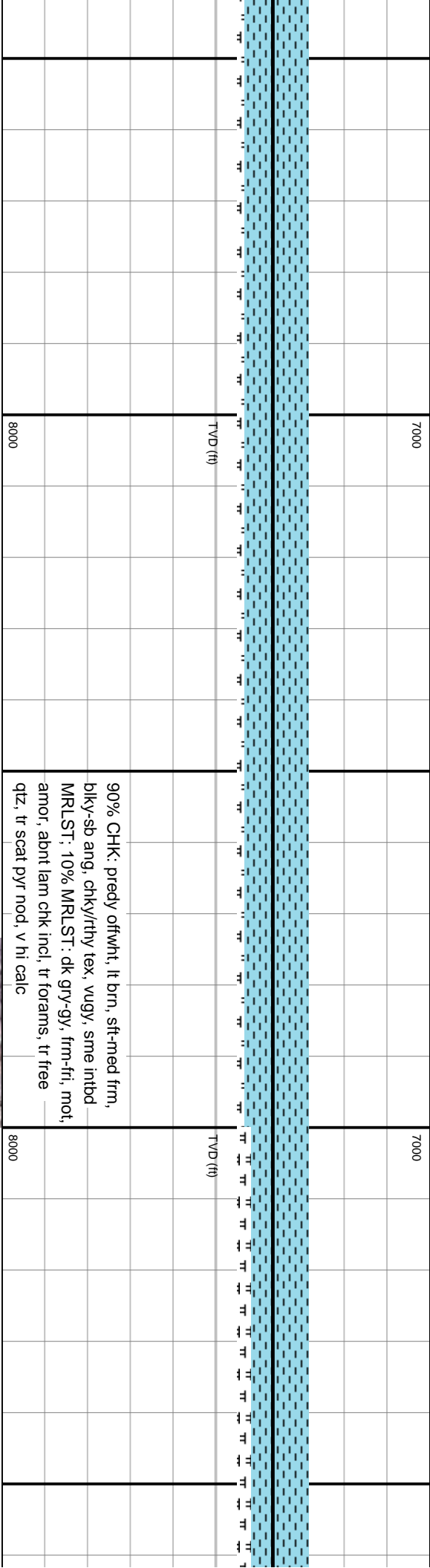
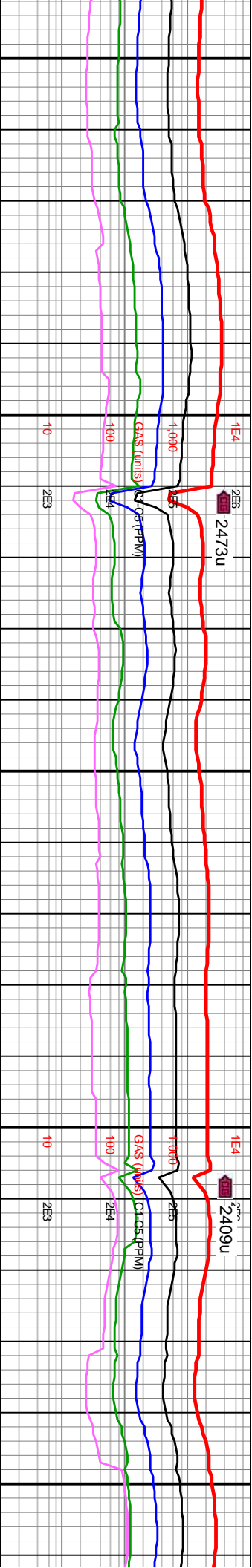
BP

MD: 11,345'
INC: 89.8°
AZM: 268.6°
TVD: 7,367.39'
VS: 3,735.66'

WOB: 30klbs
RPM: 60
SPM: 170
SPP: 3,900psi

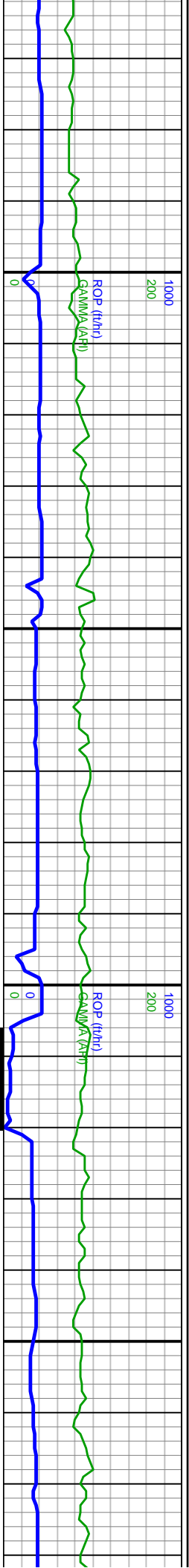
MW IN: 10.2
VIS IN: 38
MW OUT: 10.2
VIS OUT: 38

MD: 11,440'
INC: 90.4°
AZM: 268.9°
TVD: 7,367.22'
VS: 3,827.9'



90% CHK: predy oftwnt, lt brn, sft-med frm, blk-y-sb ang, chky/rthy tex, vuggy, sme intbd MRLST: 10% MRLST: dk gry-gy, frm-fri, mot, amor, abnt lam chk incl, tr forams, tr free qtz, tr scat pyr nod, v hi calc

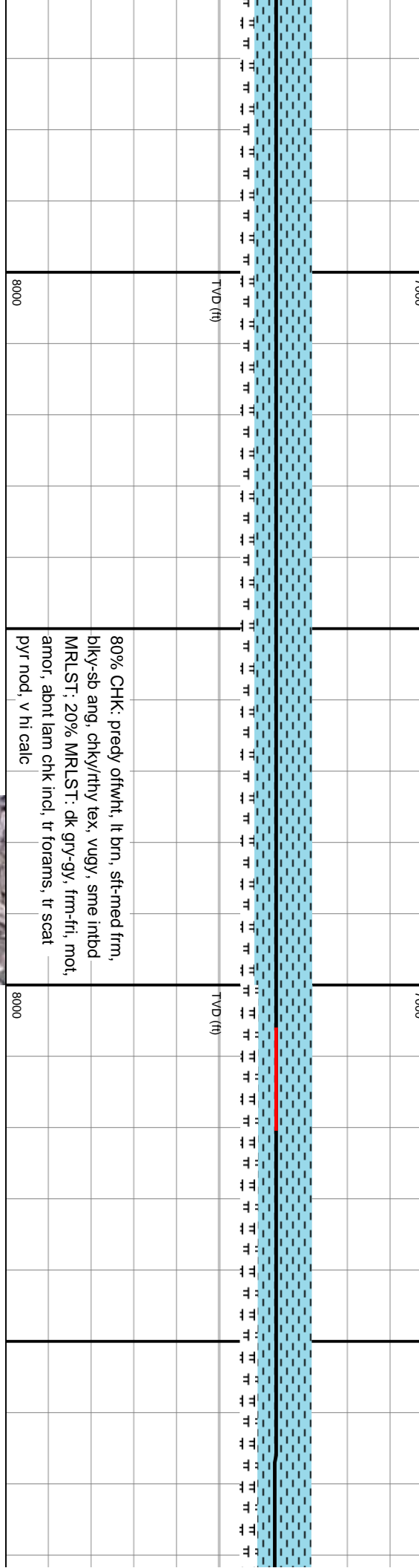
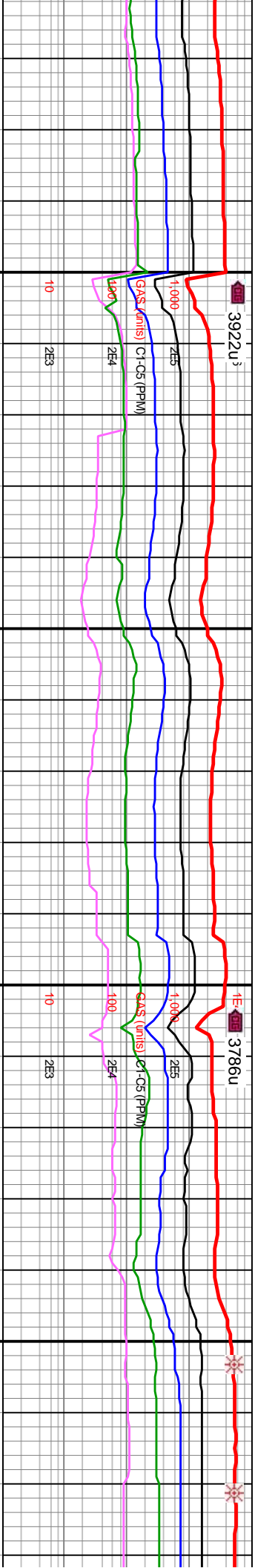




MD: 11,535'
INC: 90.5°
AZM: 268.9°
TVD: 7,366.48'
VS: 3,920.19'

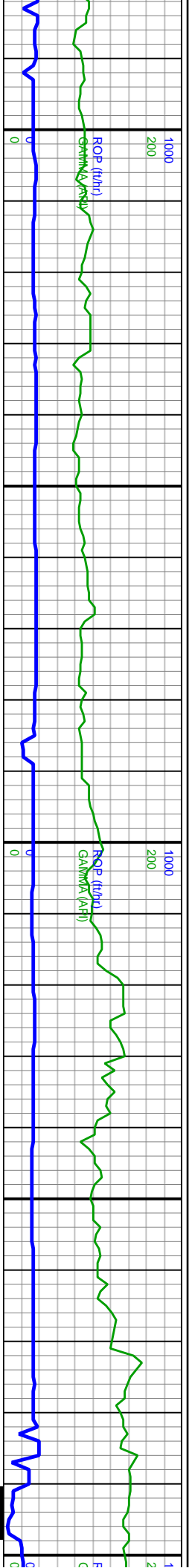
MW IN: 10.2
VIS IN: 38
MW OUT: 10.2
VIS OUT: 38
WOB: 34klbs
RPM: 25
SPM: 174
SPP: 3,345psi

MD: 11,630'
INC: 88.5°
AZM: 269.6°
TVD: 7,367.3'
VS: 4,012.61'



80% CHK: predy oftwht, lt brn, sft-med frm, blk-y-sb ang, chky/rthy tex, vugy, sme intbd
MRLST: 20% MRLST: dk gry-gy, frm-fri, mot, amor, abnt lam chk incl, tr forams, tr scat
pyr nod, v hi calc



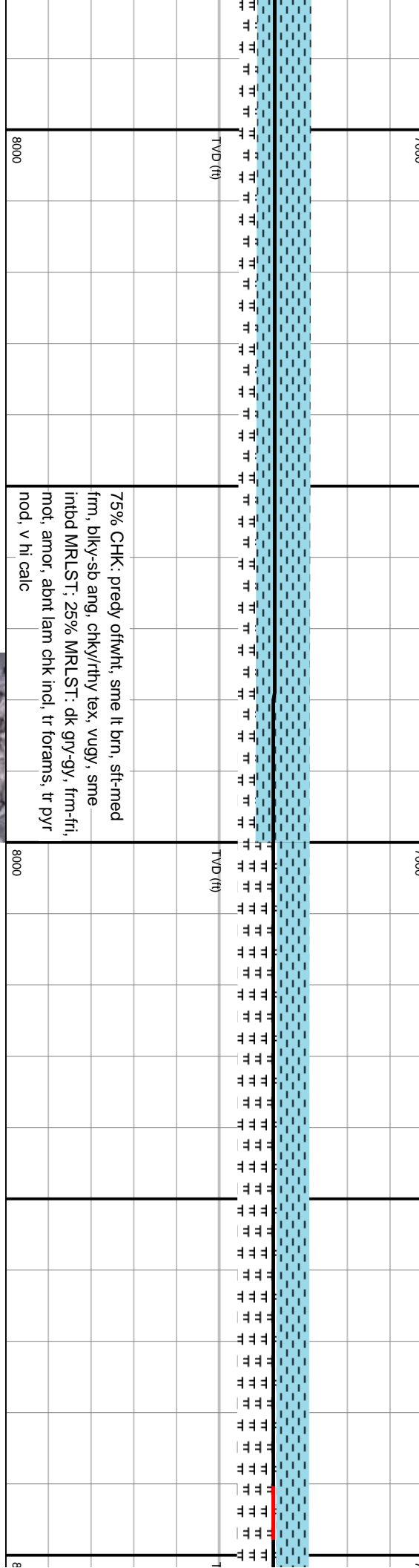
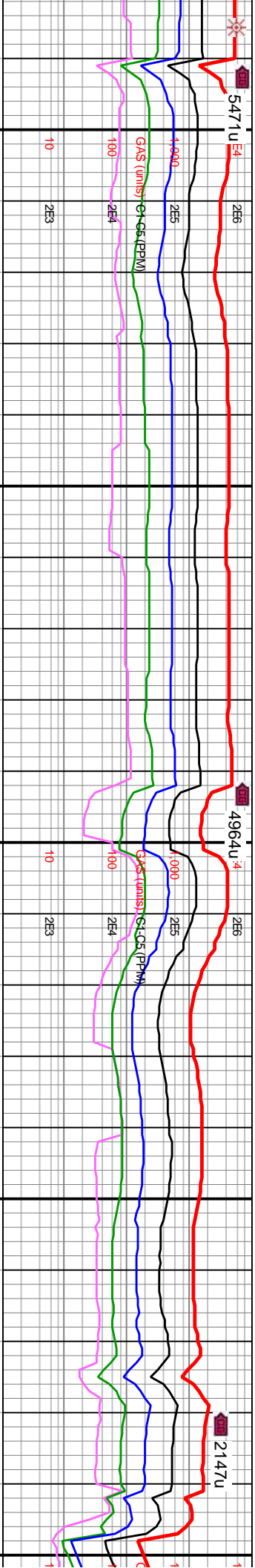


MD: 11,724'
INC: 88.3°
AZM: 269.3°
TVD: 7,369.93'
VS: 4,104.11'

MW IN: 10.2
VIS IN: 38
MW OUT: 10.2
VIS OUT: 38
WOB: 23klbs
RPM: 61
SPM: 174
SPP: 3,966psi

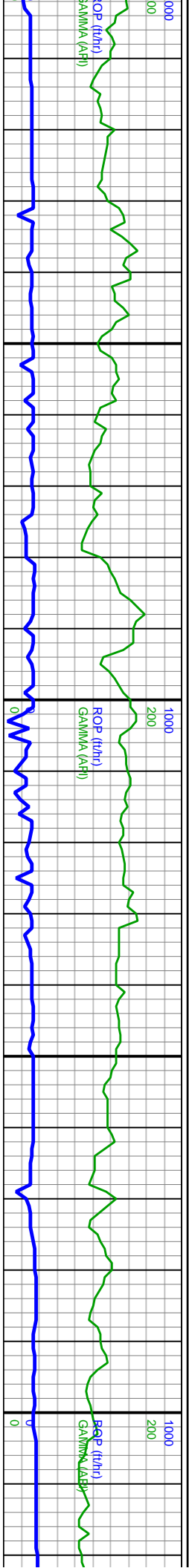
MD: 11,819'
INC: 88.1°
AZM: 268.9°
TVD: 7,372.91'
VS: 4,196.44'

MW IN: 10.2
VIS IN: 38
MW OUT: 10.2
VIS OUT: 38



75% CHK: predy ofwht, sme lt brn, sft-med
frm, biky-sb ang, chky/rthy tex, vugy, sme
intbd MRLST; 25% MRLST: dk gy-gy, frm-fri,
mot, amor, abnt lam chk incl, tr forams, tr pyr
nod, v hi calc





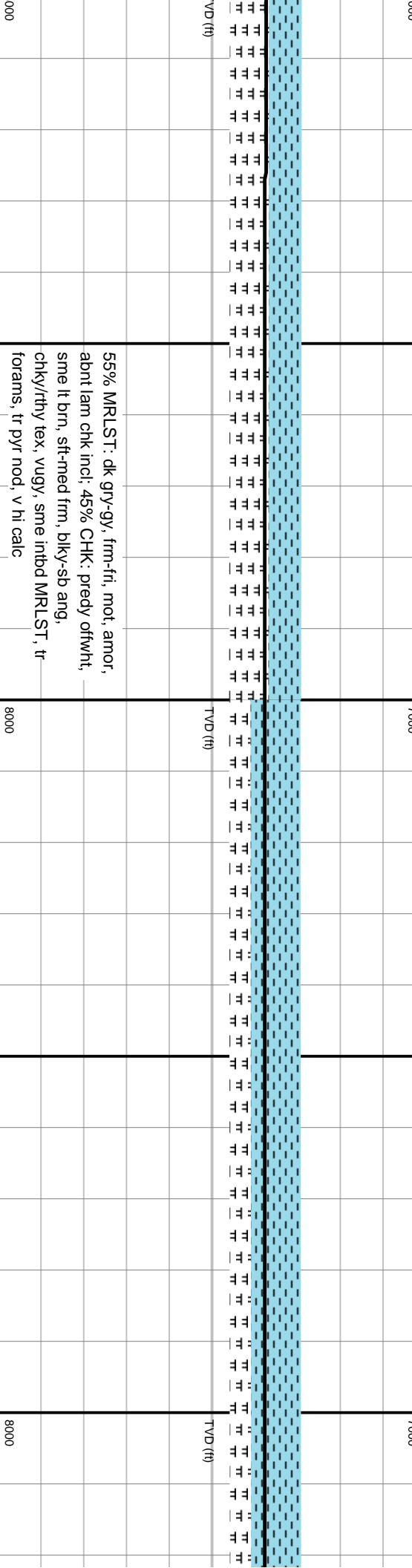
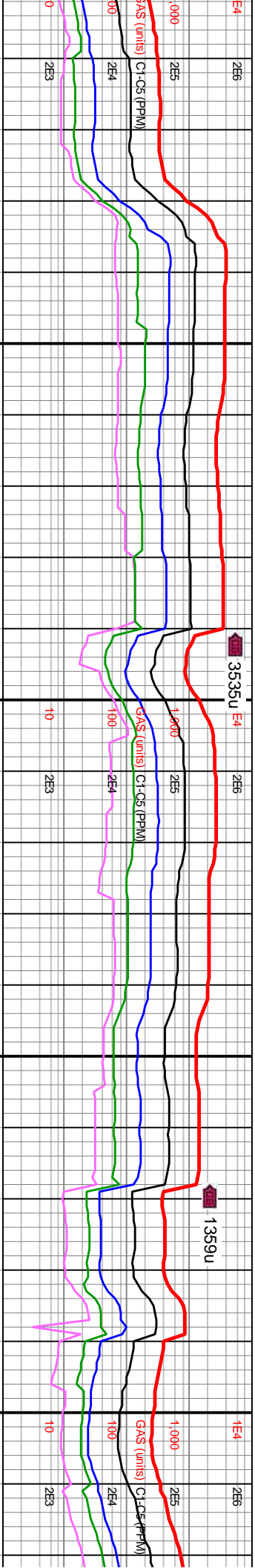
MD: 11,914'
INC: 89.5°
AZM: 269.1°
TVD: 7,374.9'
VS: 4,288.76'

WOB: 31klbs
RPM: 0
SPM: 174
SPP: 4,332psi

MD: 12,009'
INC: 89.6°
AZM: 269.1°
TVD: 7,375.65'
VS: 4,381.13'

MW IN: 10.2
VIS IN: 39
MW OUT: 10.3
VIS OUT: 39

MD: 12,104'
INC: 90.2°
AZM: 268.9°
TVD: 7,375.82'
VS: 4,473.47'



55% MRLST: dk gry-gy, frm-fri, mot, amor,
abt lam chk incl; 45% CHK: predy offwht,
sme lt brn, sft-med frm, blk-y-sb ang,
chky/rthy tex, vugy, sme intbd MRLST, tr
forams, tr pyr nod, v hi calc



