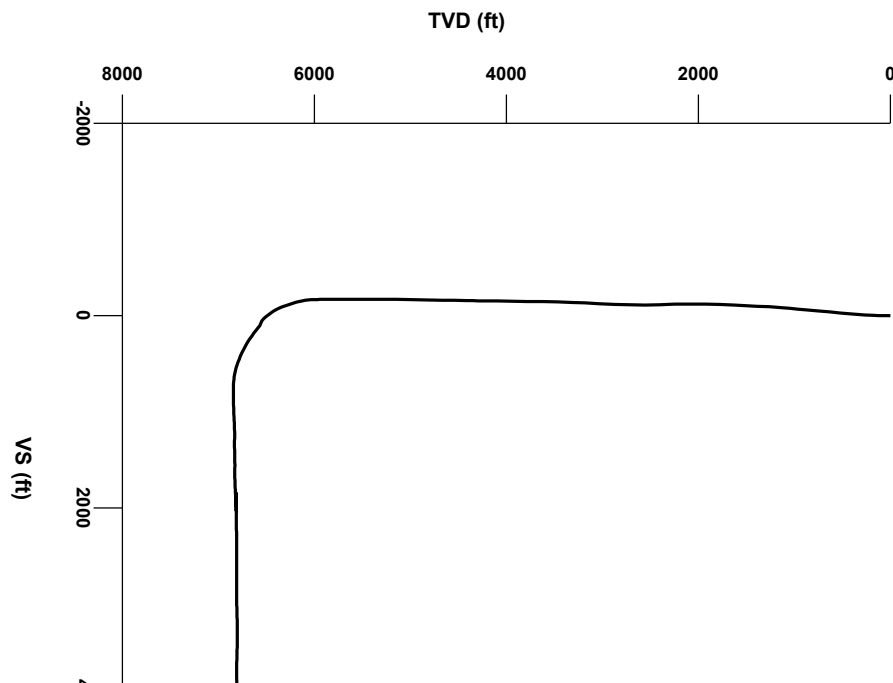


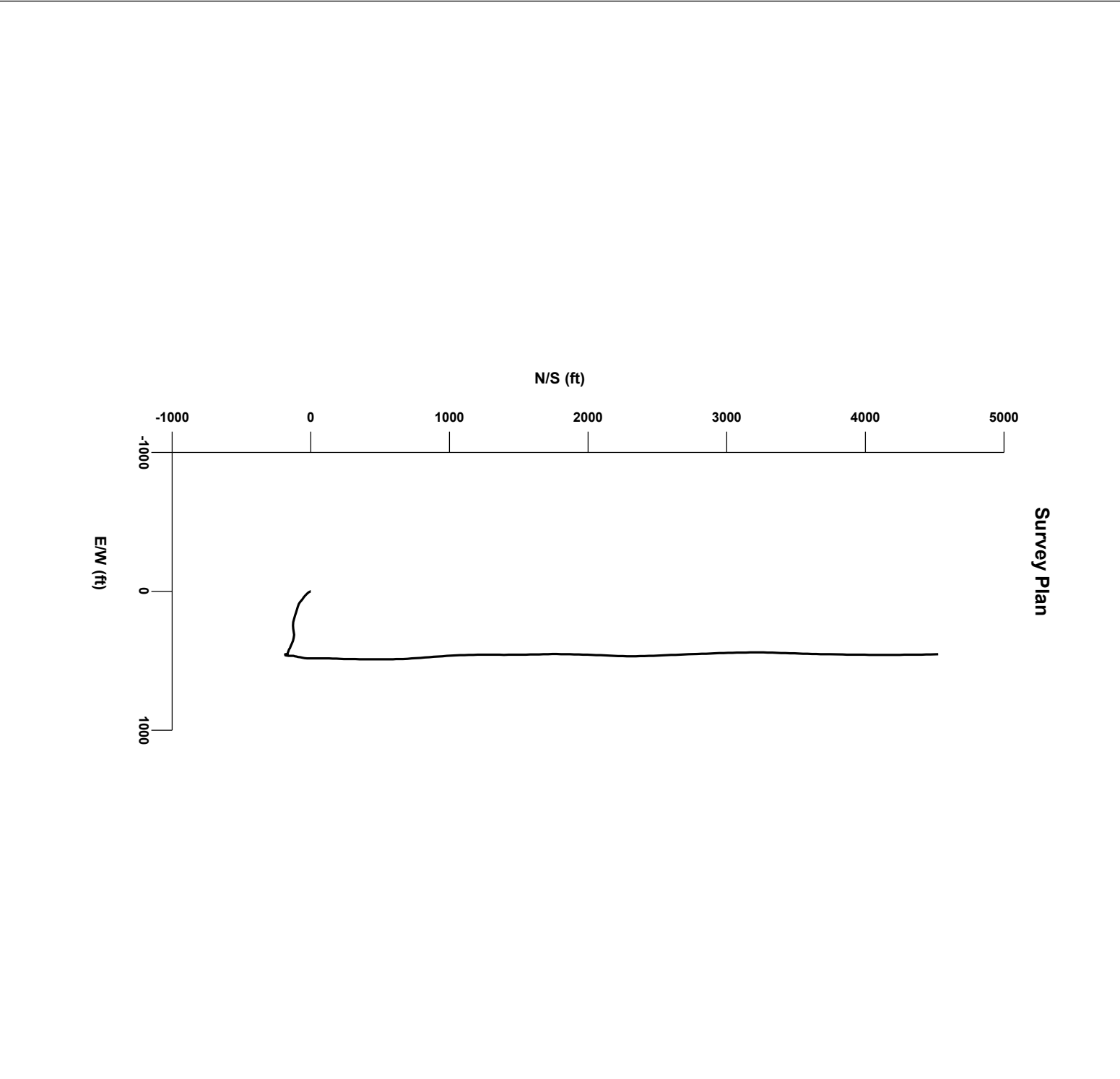
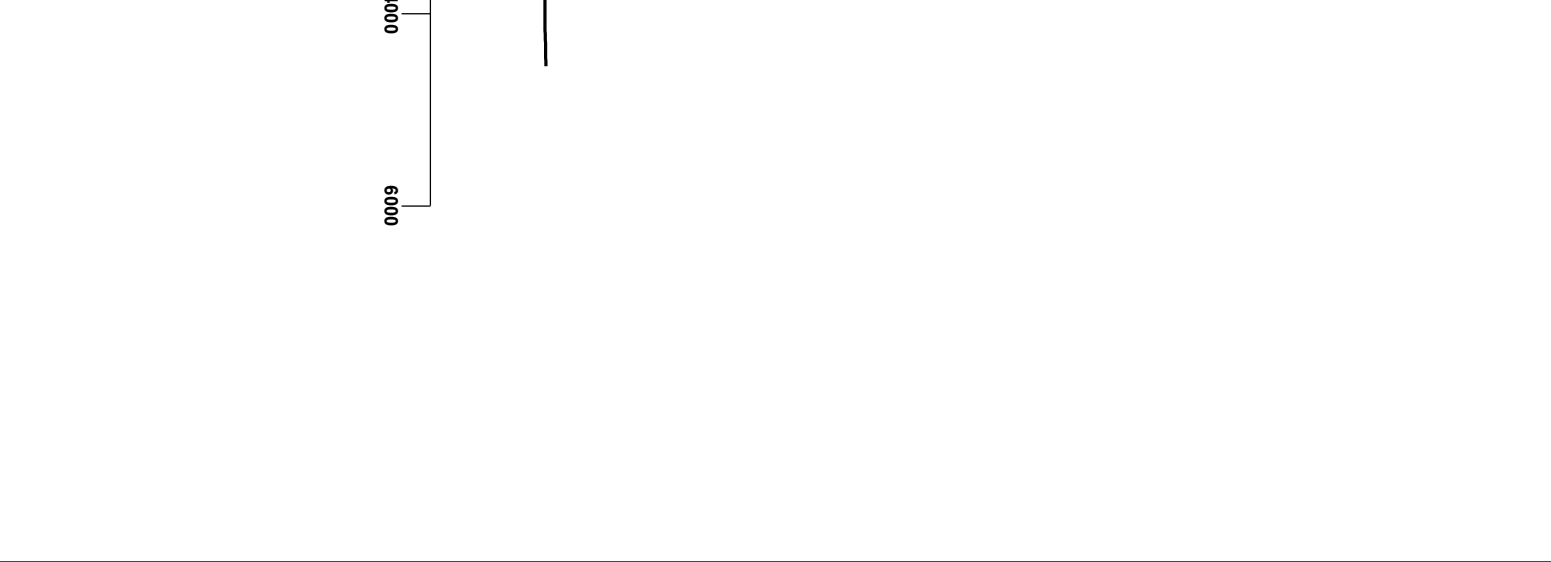


LOG created using LPLOT VH Version 3.0, July 04, 2013, Copyright (C) 1999-2009 Pason Systems Corp.

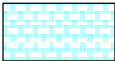
**OPERATOR:** PDC ENERGY, INC.  
**WELL:** WASTE MANAGEMENT 2L-201  
**LOCATION:** SWSW SEC 2, 2N, 64W, 6TH  
**COUNTY:** WELD  
**STATE:** COLORADO  
**SPOT:** 230' FSL & 710' FWL  
**ELEVATION:** GL 4,939' KB 4,954'  
**FIELD:** WATTENBURG  
**SPUD DATE:** 6/27/2013  
**TD DATE:** 7/4/2013  
**DATES LOGGED:** 6/30/2013 - 7/4/2013  
**DEPTHS LOGGED:** 6800' - 11213'  
**LOGGERS:** SCOTT HAMPTON, ANDREW SIMMONS  
**DRILLING FLUID:** LSND  
**DRILLING RIG:** ENSIGN 14  
**API:** 05-123-36956  
**LOG TYPE:** BUILD & LATERAL (NIOBRARA)  
**SCALE:** 1:240 (5 inches per 100 feet)  
**REMARKS:** WELLSITE GEOLOGICAL SERVICES PROVIDED BY COLUMBINE LOGGING, INC.



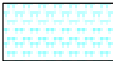
Survey Elevation



LITHOLOGIES



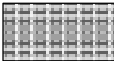
Chalk



Marl



Shaly Siltstone



Silty Shale

ENGINEERING SYMBOLS



Bit Change



Casing



Casing



Connection



Connection Gas



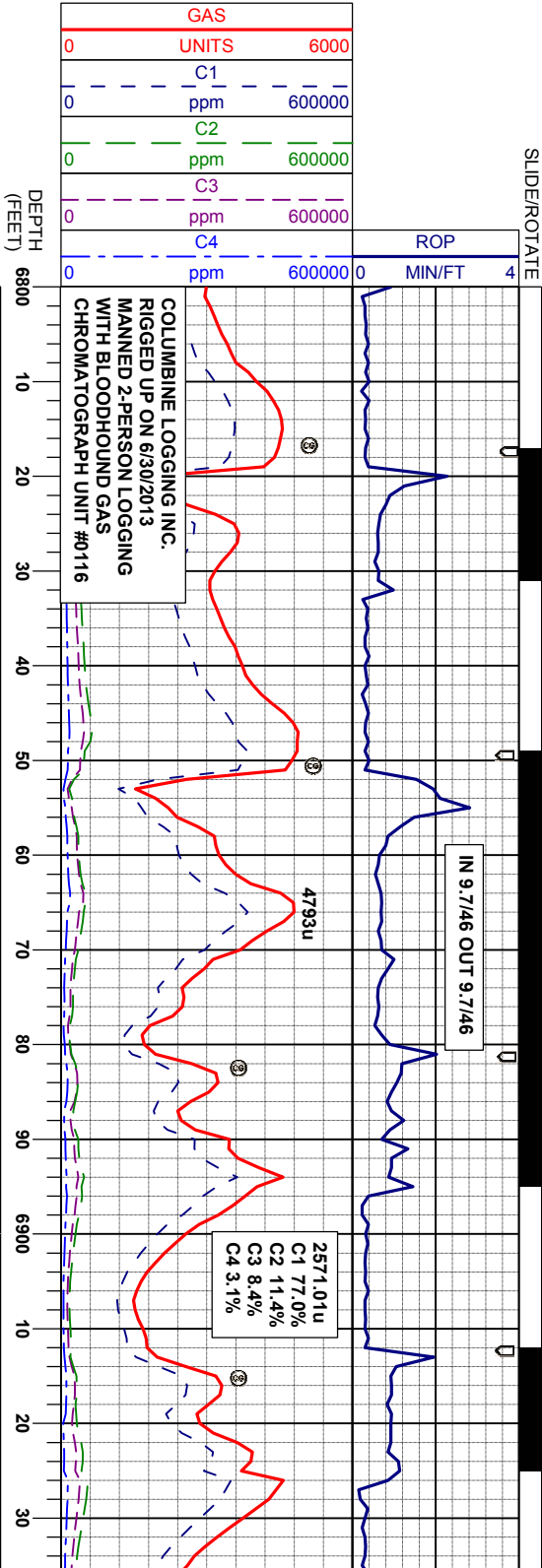
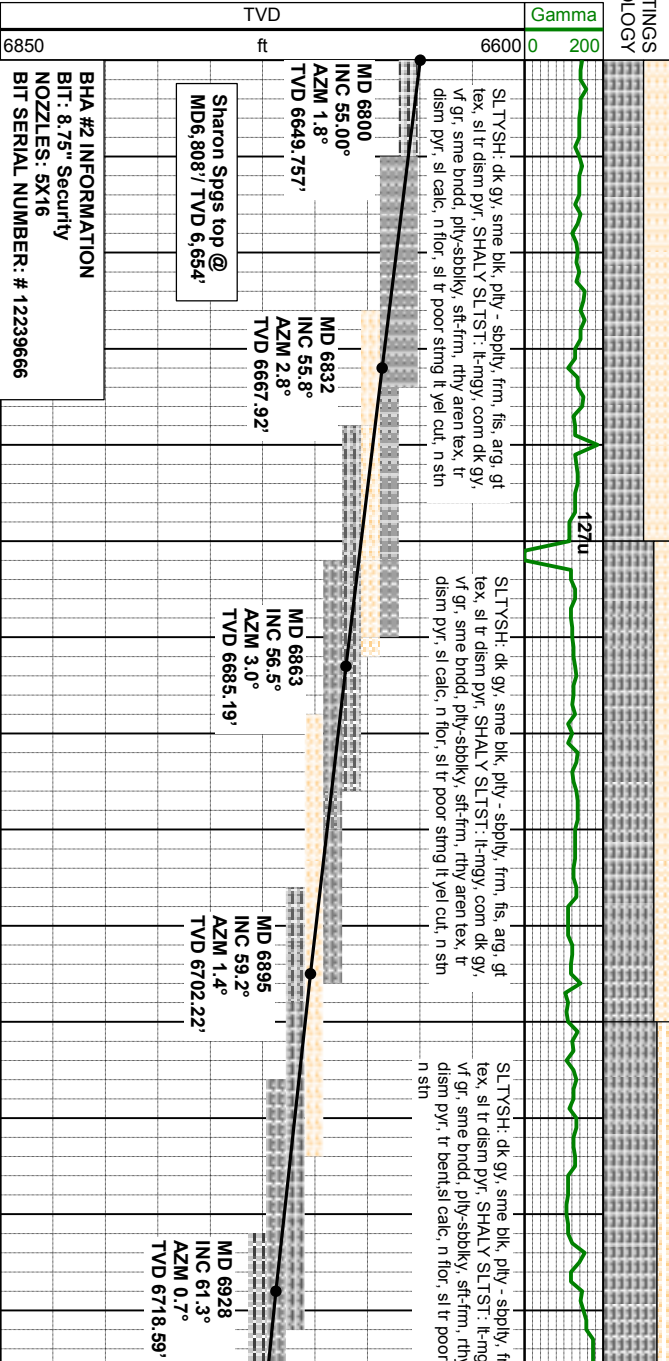
Midnight Depth

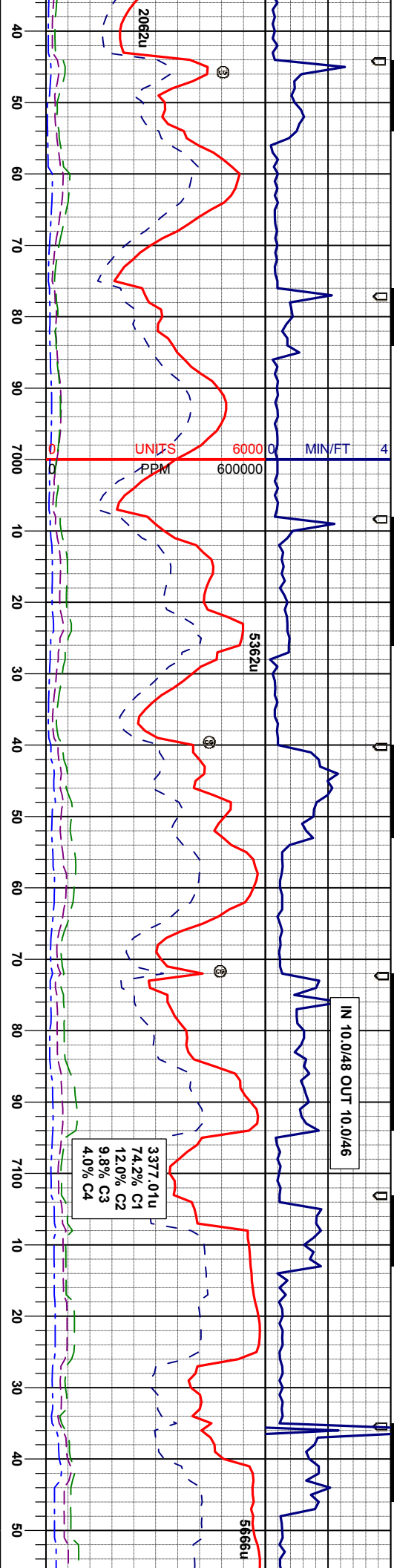
SAMPLE PHOTOS



OIL SHOW

T F G





150u

SLTYSH: dk gy, sme blk, pily - stpily, frm, fis, arg, gt  
tex, sl tr dism pyr, tr bent MCL: m-dk gy, stf, sb bily,  
rthy lstr, mot tex v calc w/ org mat n flor, sting bri yel  
cut, lt yel sin.

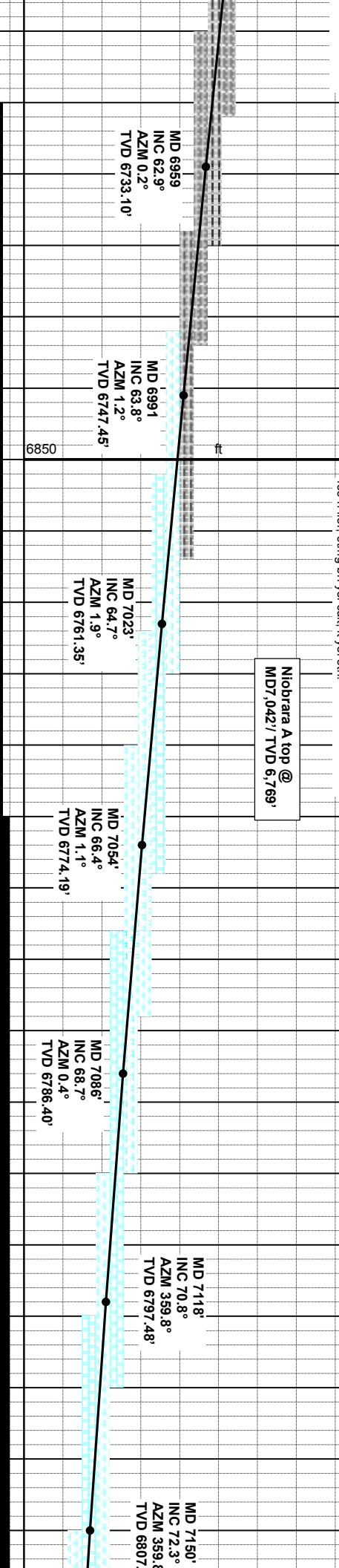
282u

SLTYSH: dk gy, sme blk, pily - stpily, frm, fis, arg, gt  
tex, sl tr dism pyr, tr bent MCL: m-dk gy, stf, sb bily,  
rthy lstr, mot tex v calc w/ org mat CHK: lt-m gy, stf, sb  
pily & bily, rthy-sb wxy lstr, mot & lam tex, v calc, rr  
fos n flor, sting bri yel cut, lt yel sin.

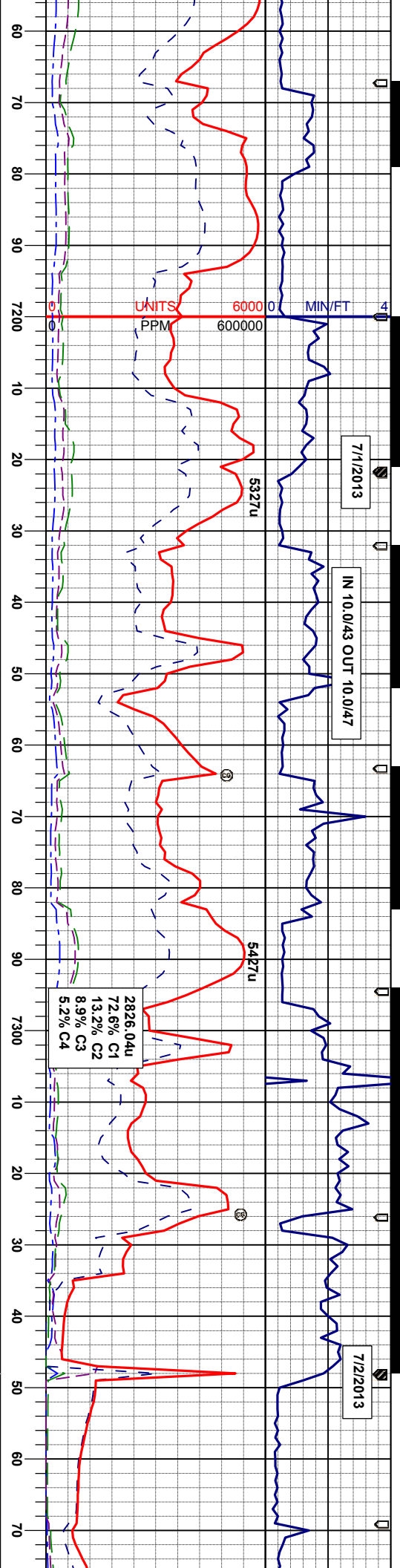
11

CHK: lt-m gy, lt brn ip, stf, sb pily & bily, rthy-sb wxy  
lstr, mot & lam tex, v calc, rr fosMRL: m-dk gy, stf, sb  
bily, rthy lstr, mot tex v calc w/ org mat, n flor, sting bri  
yel cut, lt yel sin.

CHK: lt-m gy, lt brn ip, stf, sb pily & bily, rthy-sb wxy  
lstr, mot & lam tex, v calc, rr fosMRL: m-dk gy, stf, sb  
bily, rthy lstr, mot tex v calc w/ org mat, n flor, sting bri  
yel cut, lt yel sin.







Itm gy, lt brn ip, sft, sb ply & blk, rthy-sb wxy  
mot & lam tex, v calc, r fssMRL: m-dk gy, sft, sb  
blk, rthy lstr, mot tex v calc w/ org mat, n flor, sting bri  
cut, lt yel sin.

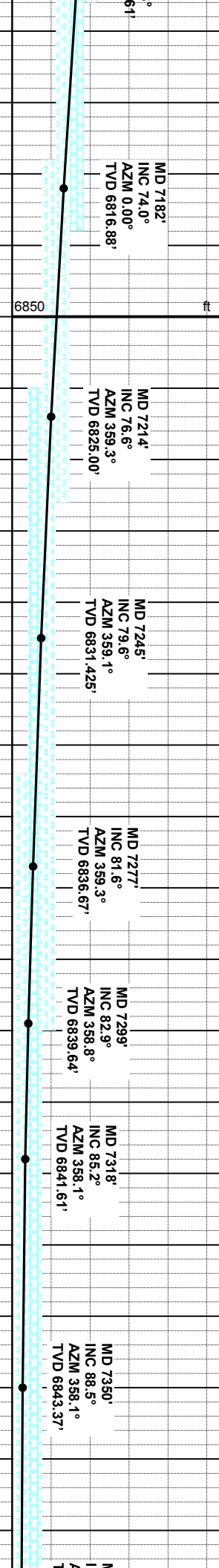
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lstr, mot & lam tex, v calc, r fssMRL: m-dk gy, sft, sb  
blk, rthy lstr, mot tex v calc w/ org mat, n flor, sting bri  
yel cut, lt yel sin.

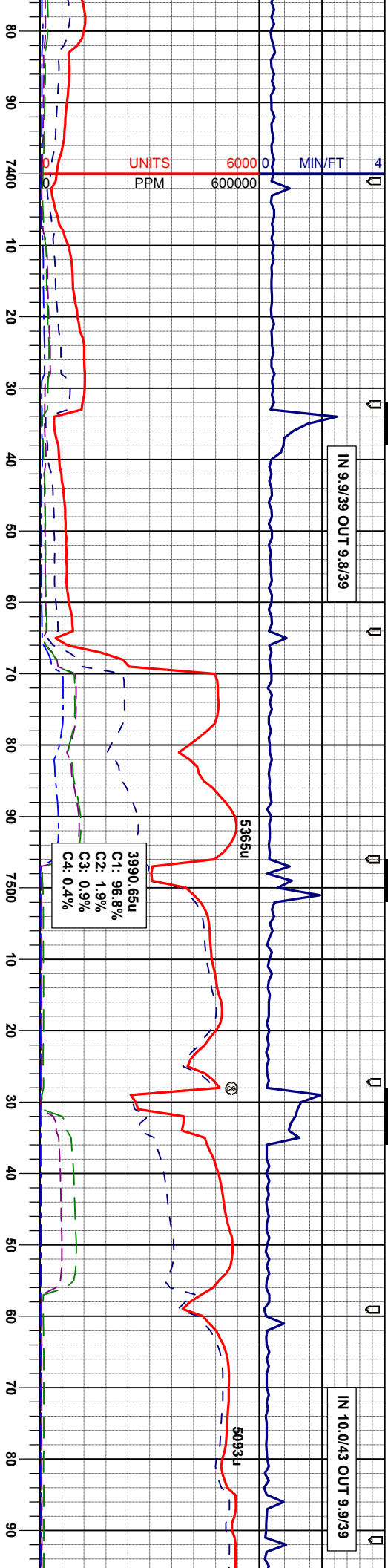
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lstr, mot & lam tex, v calc, r fssMRL: m-dk gy, sft, sb  
blk, rthy lstr, mot tex v calc w/ org mat, n flor, sting bri  
yel cut, lt yel sin.

MRL: m-dk gy, sft, sb blk, rthy lstr, mot tex v calc w/  
org mat,CHK: Itm gy, lt brn ip, sft, sb ply & blk, rthy-  
sb wxy lstr, mot & lam tex, v calc, r fss n flor, sting bri  
yel cut, lt yel sin.

MRL: m-dk gy, sft, sb blk, rthy lstr, mot tex v calc w/  
org mat,CHK: Itm gy, lt brn ip, sft, sb ply & blk, rthy-  
sb wxy lstr, mot & lam tex, v calc, r fss n flor, sting bri  
yel cut, lt yel sin.

**BHA #3 INFORMATION**  
BIT: 6 1/8" SMITH  
NOZZLES: 5X16  
BIT SERIAL NUMBER: # JG9428





131u

6750

MRL: m-dk gy, sft, sb blk, rthy lsfr, mot tex v calc w/  
org mat CHK: lt-m gy, lt brn lp, sft, sb ply & blk, rthy-  
sb wxy lsfr, mot & lam tex, v calc, tr fos n flr, sting bri  
yel cut, lt yel sn.

120

MRL: m-dk gy, sft, sb blk, rthy lsfr, mot tex v calc w/  
org mat CHK: lt-m gy, lt brn lp, sft, sb ply & blk, rthy-  
sb wxy lsfr, mot & lam tex, v calc, tr fos n flr, sting bri  
yel cut, lt yel sn.

129

MRL: m-dk gy, sft, sb blk, rthy lsfr, mot tex v calc w/  
org mat CHK: lt-m gy, lt brn lp, sft, sb ply & blk, rthy-  
sb wxy lsfr, mot & lam tex, v calc, tr fos n flr, sting bri  
yel cut, lt yel sn.

TVD SCALE CHANGE  
6750-6850

MD 7413'  
INC 89.3°  
AZM 356.1°  
TVD 6844.52'

MD 7445'  
INC 89.9°  
AZM 356.00°  
TVD 6844.74'

MD 7476'  
INC 90.1°  
AZM 356.0°  
TVD 6844.74'

MD 7508'  
INC 90.3°  
AZM 355.6°  
TVD 6844.63'

MD 7540'  
INC 91.2°  
AZM 355.6°  
TVD 6844.21'

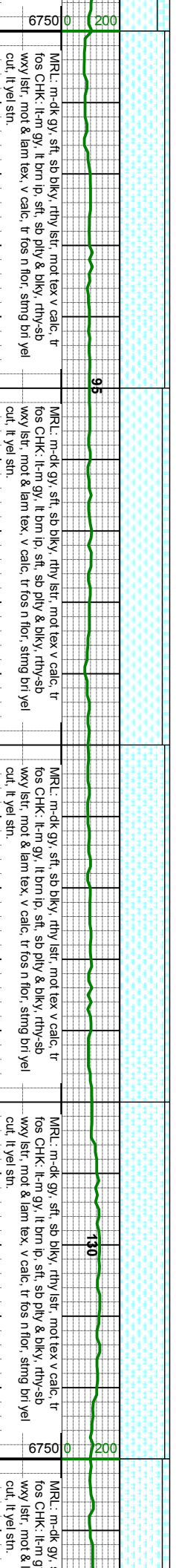
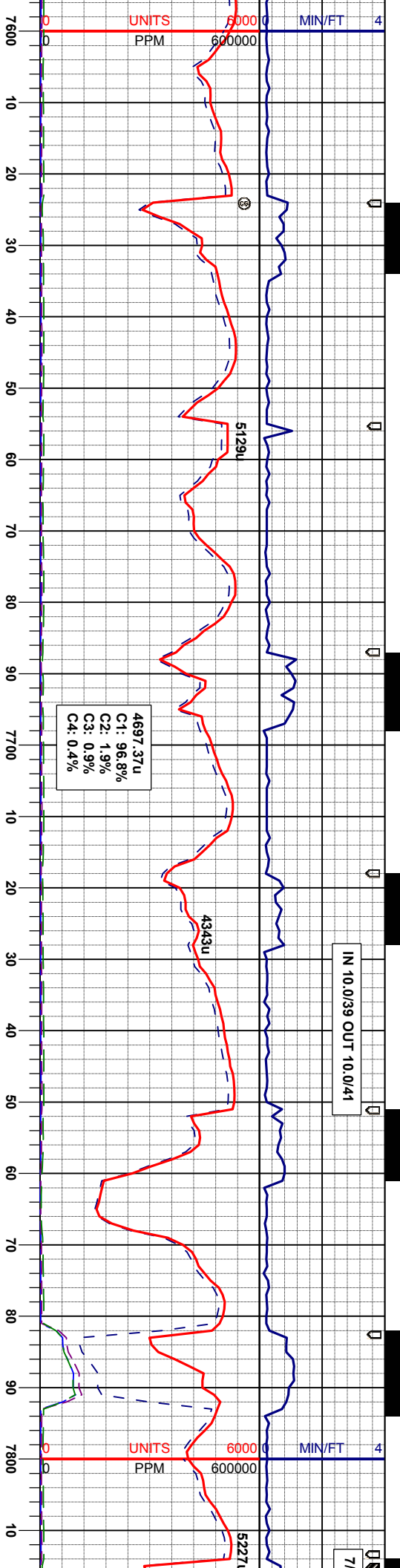
MD 7572'  
INC 91.8°  
AZM 355.4°  
TVD 6843.37'

ID 7381'  
INC 89.0°  
AZM 356.7°  
TVD 6844.04'

6850







MRL: m-dk gy, sft, sb blk, rthy lstr, mot tex v calc, tr fos CHK: lt-m gy, lt brn lp, sft, sb ply & blk, rthy-sb wxy lstr, mot & lam tex, v calc, tr fos n flr, sting br yel cut, lt yel sn.

MRL: m-dk gy, sft, sb blk, rthy lstr, mot tex v calc, tr fos CHK: lt-m gy, lt brn lp, sft, sb ply & blk, rthy-sb wxy lstr, mot & lam tex, v calc, tr fos n flr, sting br yel cut, lt yel sn.

MRL: m-dk gy, sft, sb blk, rthy lstr, mot tex v calc, tr fos CHK: lt-m gy, lt brn lp, sft, sb ply & blk, rthy-sb wxy lstr, mot & lam tex, v calc, tr fos n flr, sting br yel cut, lt yel sn.

MRL: m-dk gy, sft, sb blk, rthy lstr, mot tex v calc, tr fos CHK: lt-m gy, lt brn lp, sft, sb ply & blk, rthy-sb wxy lstr, mot & lam tex, v calc, tr fos n flr, sting br yel cut, lt yel sn.

MD 7603' INC 92.2° AZM 355.4° TVD 6842.29'

MD 7635' INC 92.0° AZM 356.1° TVD 6841.12'

MD 7667' INC 92.3° AZM 356.1° TVD 6839.92'

MD 7699' INC 92.6° AZM 356.7° TVD 6838.55'

MD 7731' INC 92.4° AZM 357.0° TVD 6837.160'

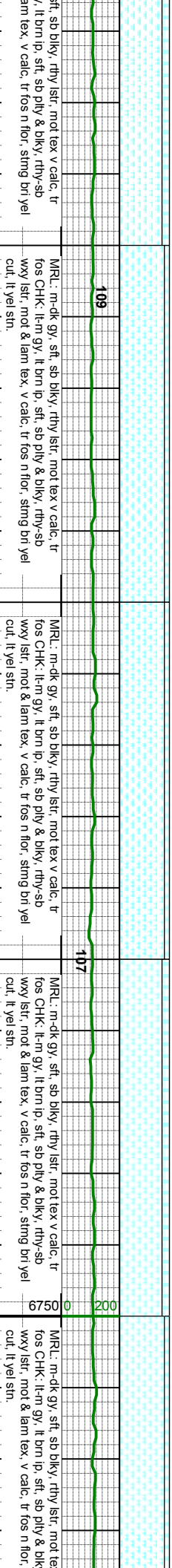
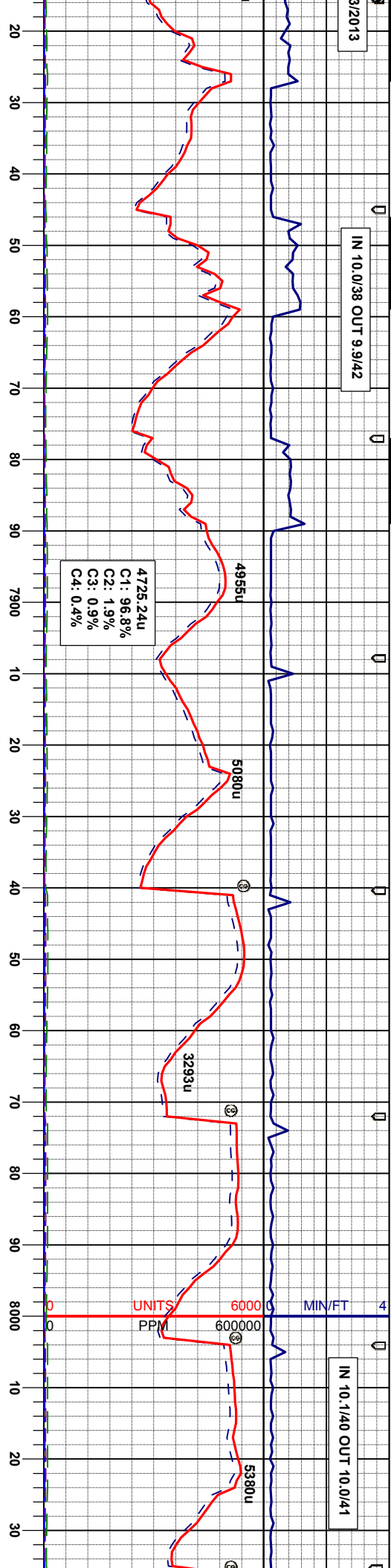
MD 7762' INC 92.3° AZM 357.9° TVD 6835.88'

MD 7794' INC 92.2° AZM 358.4° TVD 6834.63'



IN 10.0/38 OUT 9.9/42

IN 10.1/40 OUT 10.0/41



MD 7857'  
INC 90.7°  
AZM 358.1°  
TVD 6832.894'

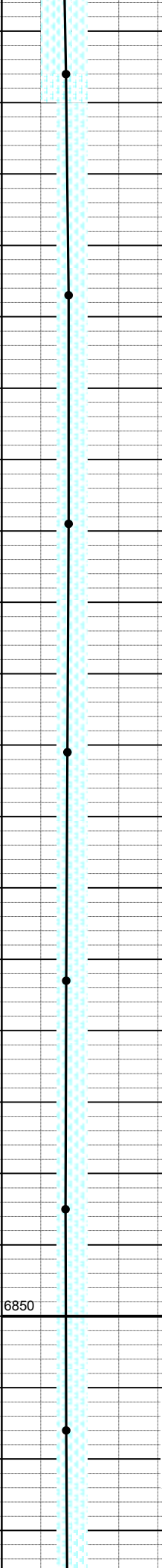
MD 7889'  
INC 89.4°  
AZM 0.40°  
TVD 6832.86'

MD 7921  
INC 89.4°  
AZM 0.40°  
TVD 6833.20'

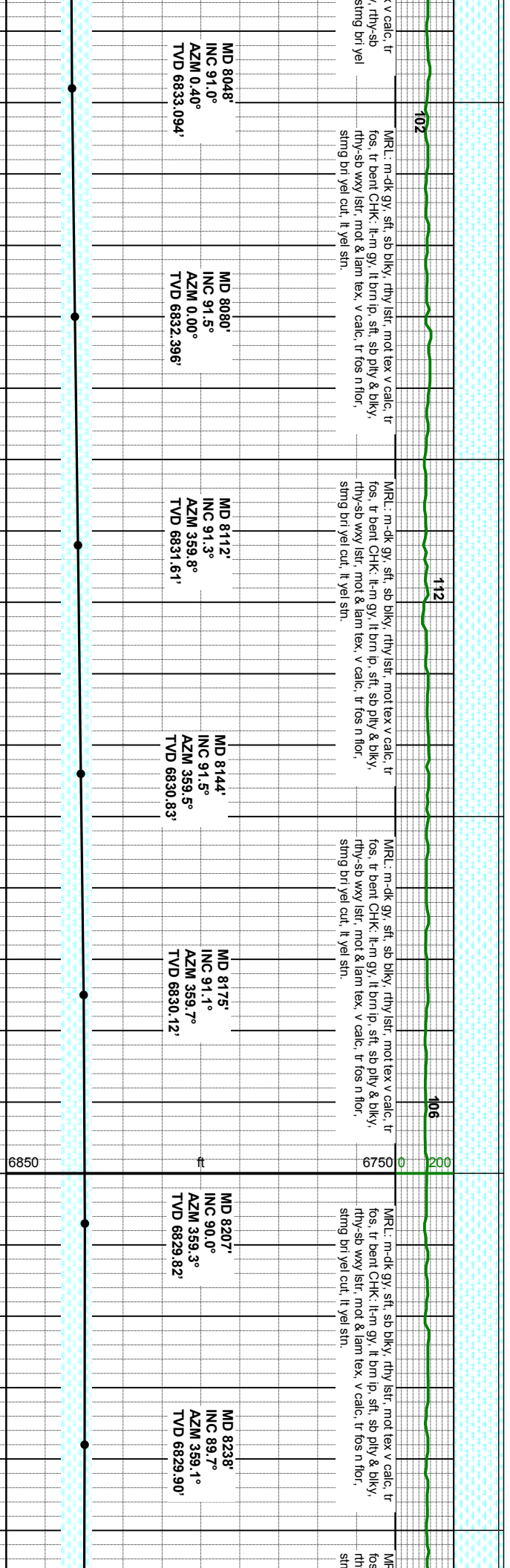
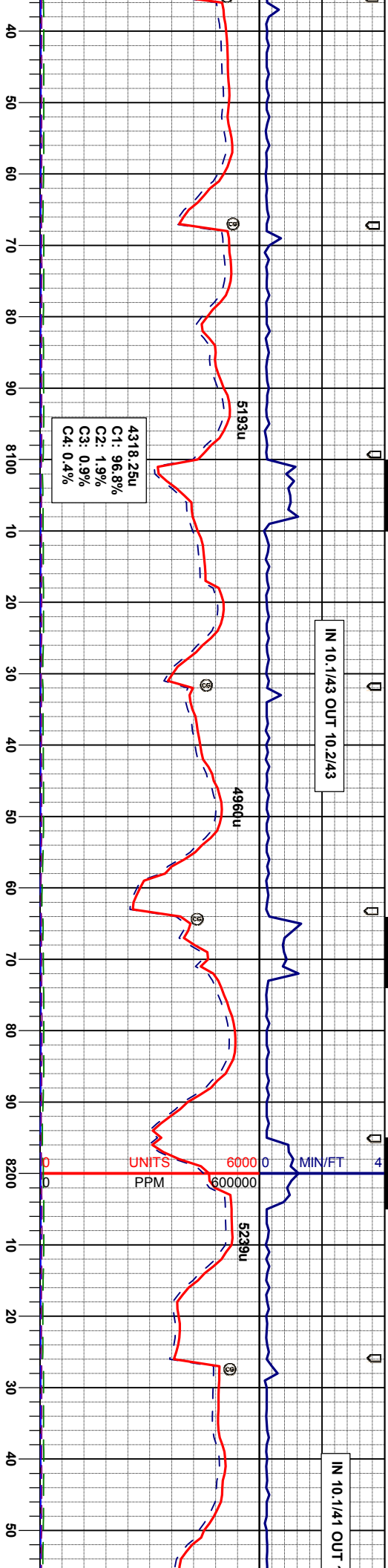
MD 7953'  
INC 89.5°  
AZM 359.8°  
TVD 6833.50'

MD 7985'  
INC 90.0°  
AZM 0.00°  
TVD 6833.64'

MD 8016'  
INC 90.5°  
AZM 359.8°  
TVD 6833.51'





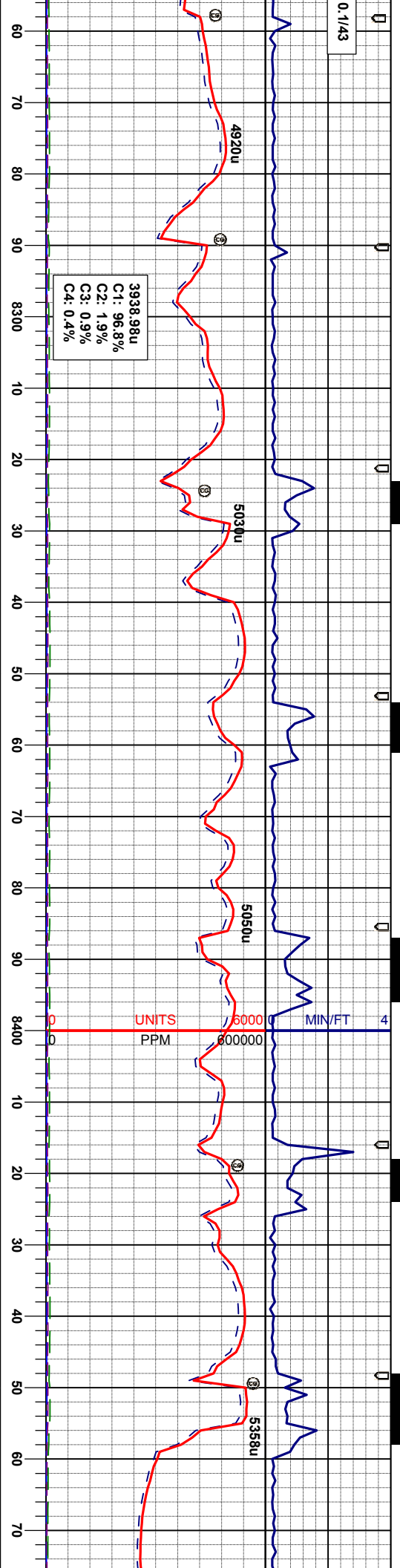


MD 8048' INC 91.0° AZM 0.40° TVD 6833.094'	MD 8080' INC 91.5° AZM 0.00° TVD 6832.396'	MD 8112' INC 91.3° AZM 359.8° TVD 6831.61'	MD 8144' INC 91.5° AZM 359.5° TVD 6830.83'	MD 8175' INC 91.1° AZM 359.7° TVD 6830.12'	MD 8207' INC 90.0° AZM 359.3° TVD 6829.82'	MD 8238' INC 89.7° AZM 359.1° TVD 6829.90'
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v. calc. tr r. rthy-sb string brl yel cut. lt. yel sn.	MRL: m-dk gy. sft. sb blkly. rthy lst. mot tex v calc. tr fos. tr bent CHK: lt-m gy. lt brn lp. sft. sb ply & blkly. rthy-sb wvy lst. mot & lam tex. v calc. tr fos n flor. string brl yel cut. lt. yel sn.	MRL: m-dk gy. sft. sb blkly. rthy lst. mot tex v calc. tr fos. tr bent CHK: lt-m gy. lt brn lp. sft. sb ply & blkly. rthy-sb wvy lst. mot & lam tex. v calc. tr fos n flor. string brl yel cut. lt. yel sn.	MRL: m-dk gy. sft. sb blkly. rthy lst. mot tex v calc. tr fos. tr bent CHK: lt-m gy. lt brn lp. sft. sb ply & blkly. rthy-sb wvy lst. mot & lam tex. v calc. tr fos n flor. string brl yel cut. lt. yel sn.	MRL: m-dk gy. sft. sb blkly. rthy lst. mot tex v calc. tr fos. tr bent CHK: lt-m gy. lt brn lp. sft. sb ply & blkly. rthy-sb wvy lst. mot & lam tex. v calc. tr fos n flor. string brl yel cut. lt. yel sn.	MRL: m-dk gy. sft. sb blkly. rthy lst. mot tex v calc. tr fos. tr bent CHK: lt-m gy. lt brn lp. sft. sb ply & blkly. rthy-sb wvy lst. mot & lam tex. v calc. tr fos n flor. string brl yel cut. lt. yel sn.	MRL: m-dk gy. sft. sb blkly. rthy lst. mot tex v calc. tr fos. tr bent CHK: lt-m gy. lt brn lp. sft. sb ply & blkly. rthy-sb wvy lst. mot & lam tex. v calc. tr fos n flor. string brl yel cut. lt. yel sn.
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0.1/43



117  
114  
113  
80

L.: m-dk gy. sft. sb bily. rthy lst. mot tex v calc. tr  
t bent CHK. il-m gy. il brn ip. sft. sb ply & bily.  
sb wxy lst. mot & lam tex. v calc. tr fos n flor.  
ig brn yel cut. il yel sn.

MRL: m-dk gy. sft. sb bily. rthy lst. mot tex v calc. tr  
fos. tr bent w/ dism pyr CHK. il-m gy. il brn ip. sft. sb  
ply & bily. rthy-sb wxy lst. mot & lam tex. v calc. tr  
fos. tr sec calcite. n flor. sting brn yel cut. il yel sn.

MRL: m-dk gy. sft. sb bily. rthy lst. mot tex v calc. tr  
fos. tr bent w/ dism pyr CHK. il-m gy. il brn ip. sft. sb  
ply & bily. rthy-sb wxy lst. mot & lam tex. v calc. tr  
fos. tr sec calcite. n flor. sting brn yel cut. il yel sn.

MRL: m-dk gy. sft. sb bily. rthy lst. mot tex v calc. tr  
fos. tr bent w/ dism pyr CHK. il-m gy. il brn ip. sft. sb  
ply & bily. rthy-sb wxy lst. mot & lam tex. v calc. tr  
fos. tr sec calcite. n flor. sting brn yel cut. il yel sn.

MD 8270'  
INC 89.7°  
AZM 359.8°  
TVD 6830.07'

MD 8302'  
INC 89.9°  
AZM 358.6°  
TVD 6830.18'

MD 8333'  
INC 90.4°  
AZM 358.9°  
TVD 6830.10'

MD 8364'  
INC 91.6°  
AZM 358.2°  
TVD 6829.54'

MD 8397'  
INC 92.3°  
AZM 358.8°  
TVD 6828.45'

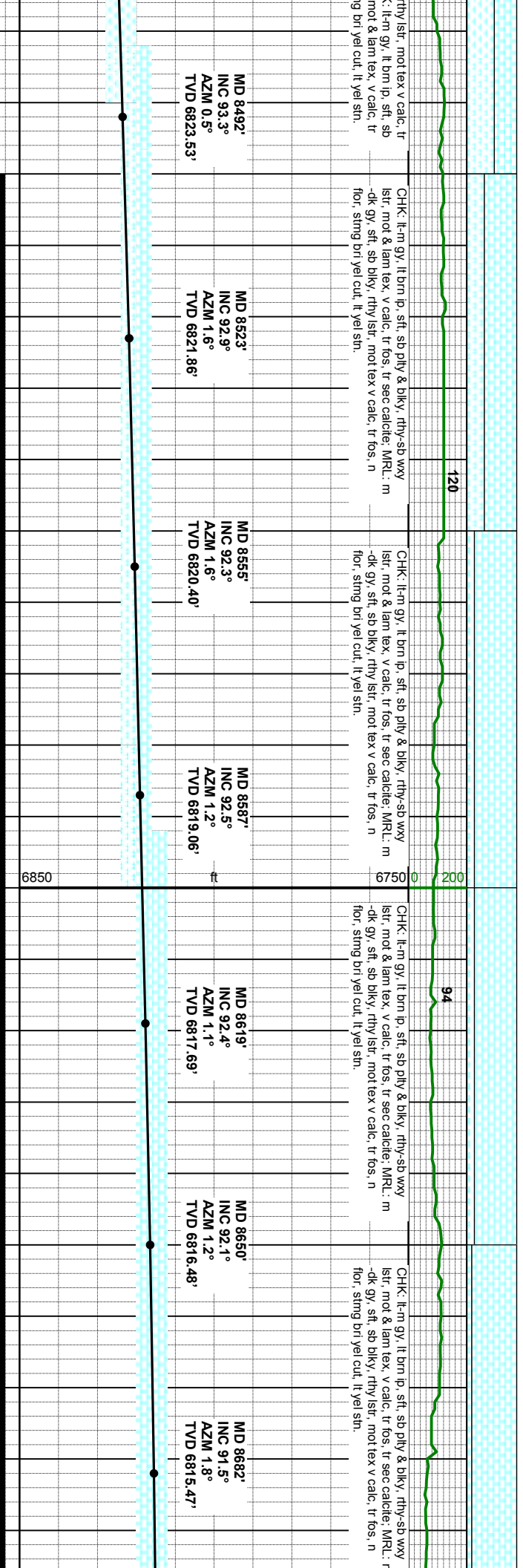
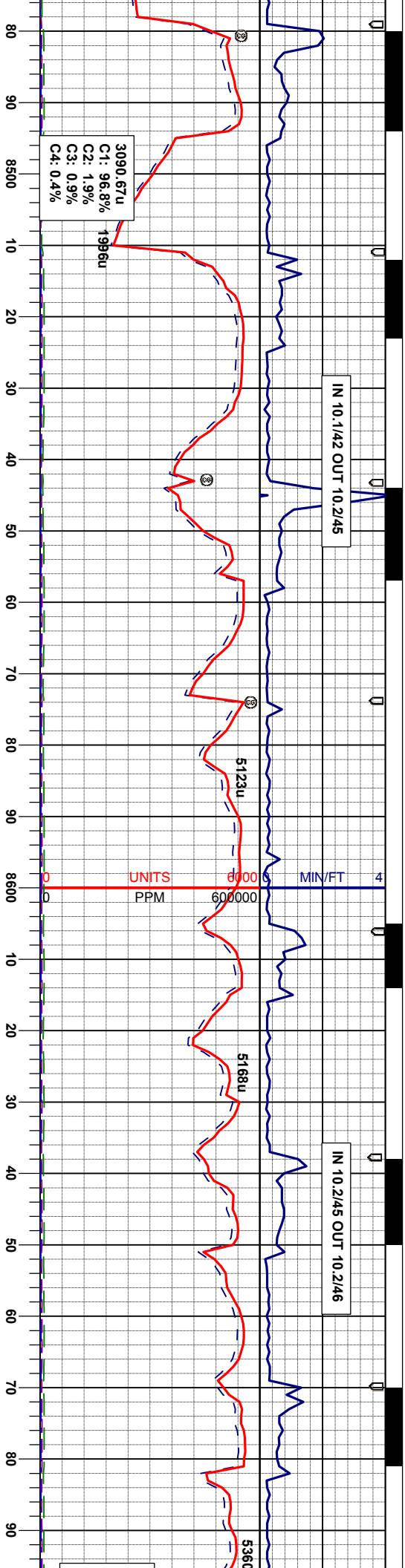
MD 8428'  
INC 93.0°  
AZM 359.5°  
TVD 6827.02'

MD 8460'  
INC 93.1°  
AZM 0.5°  
TVD 6825.32'

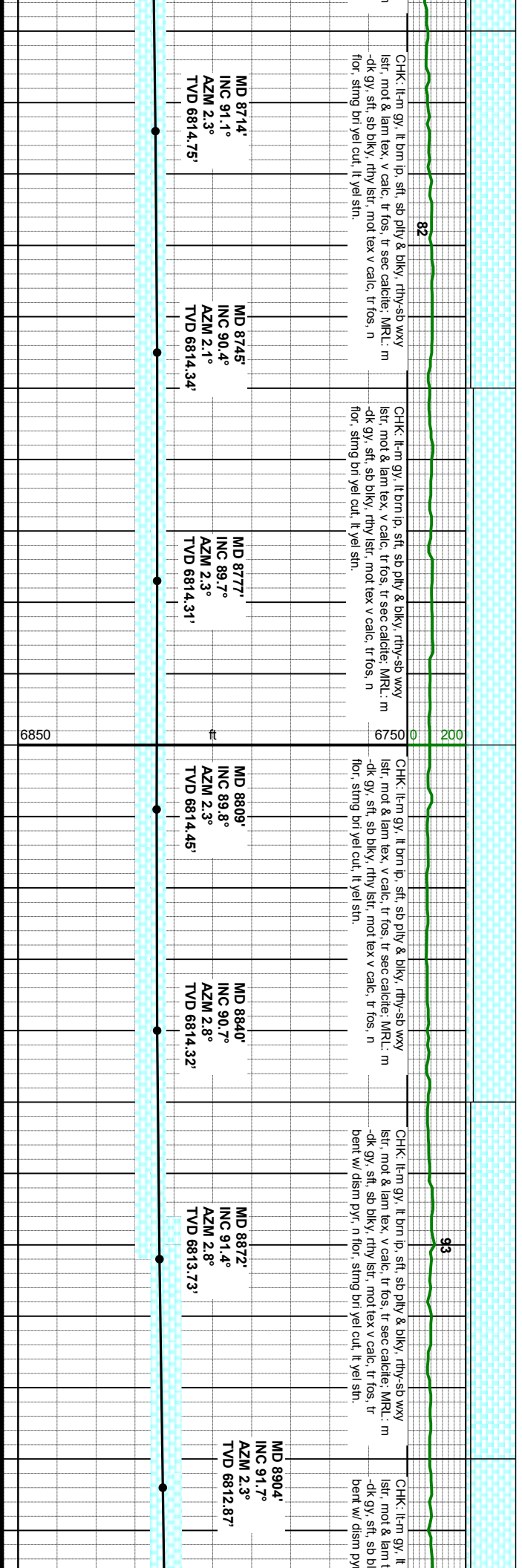
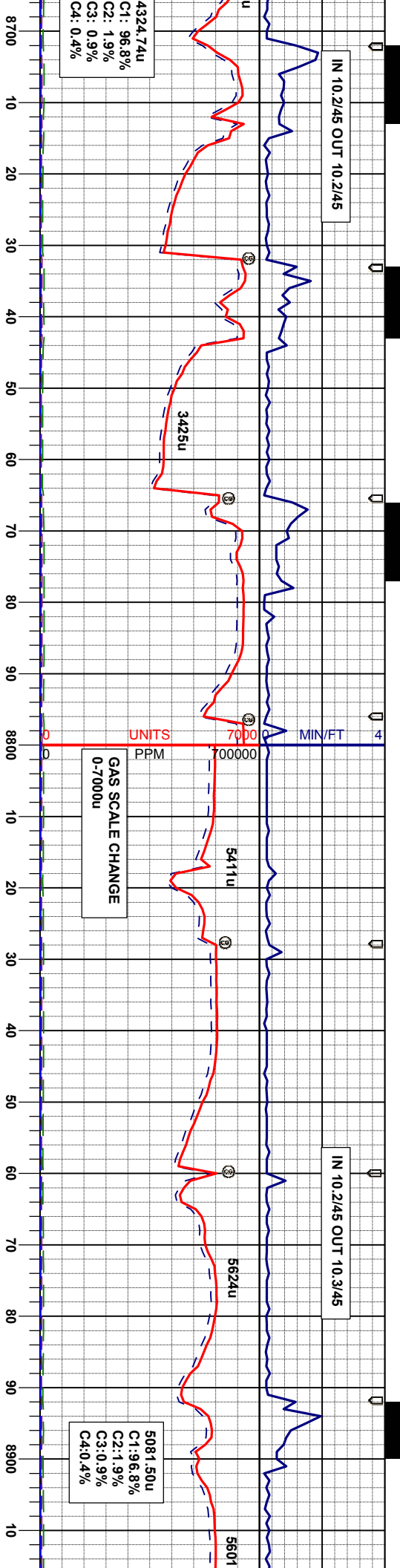
6850



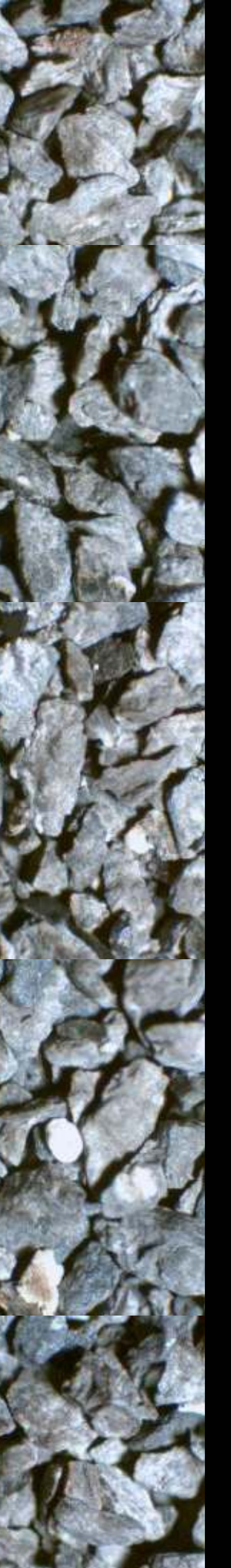
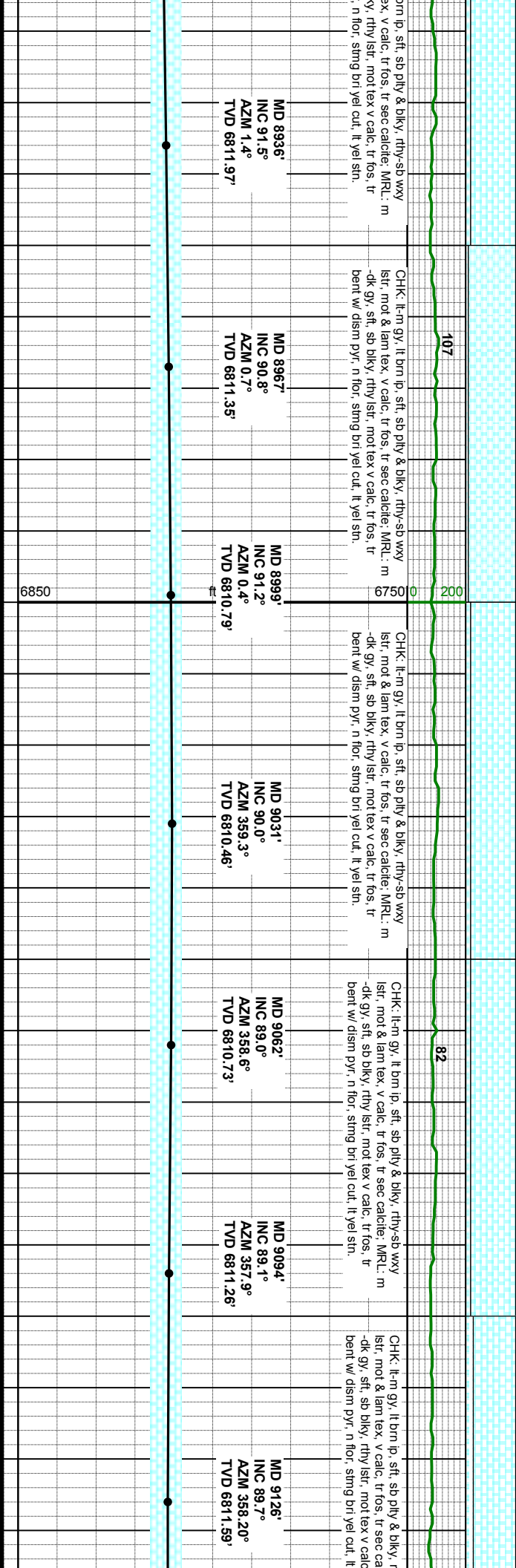
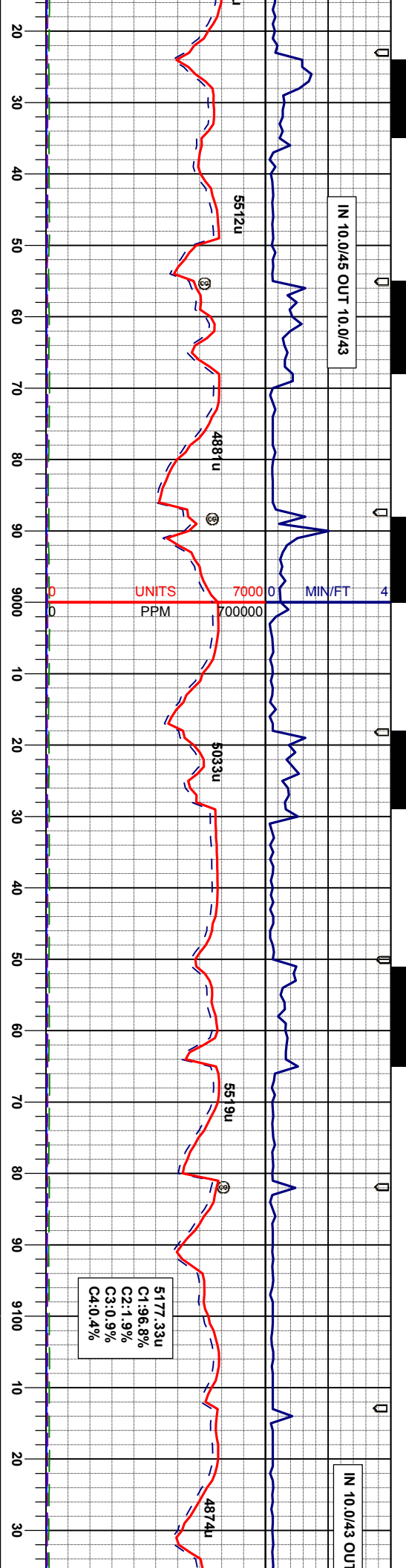


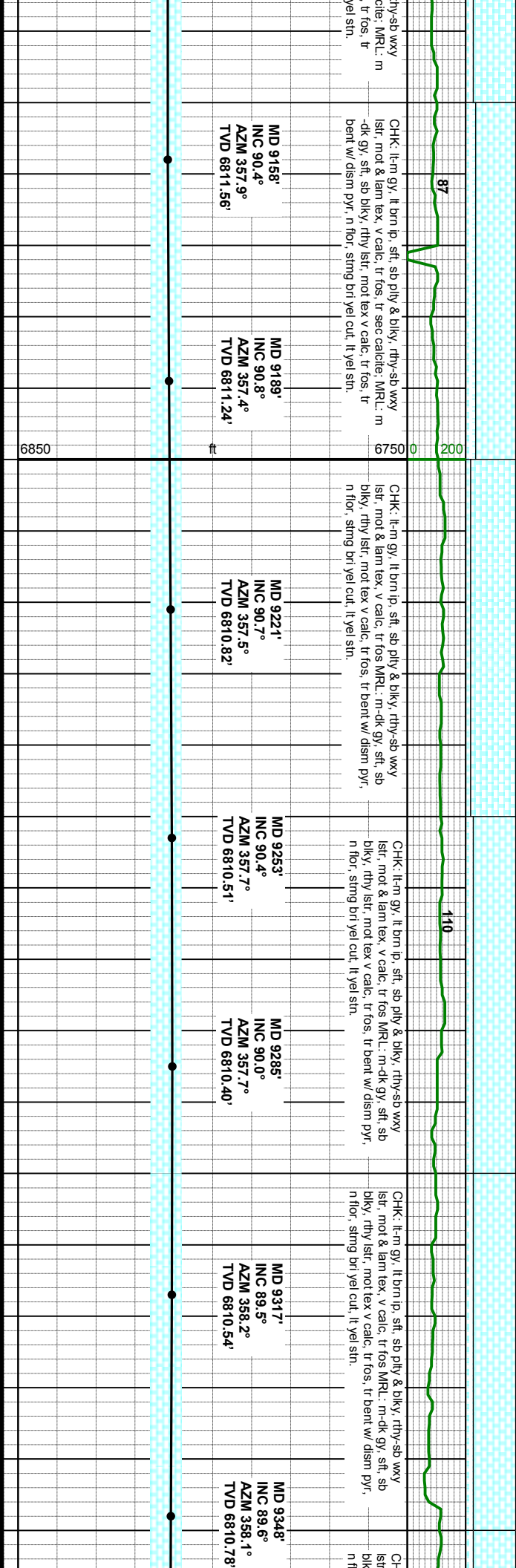
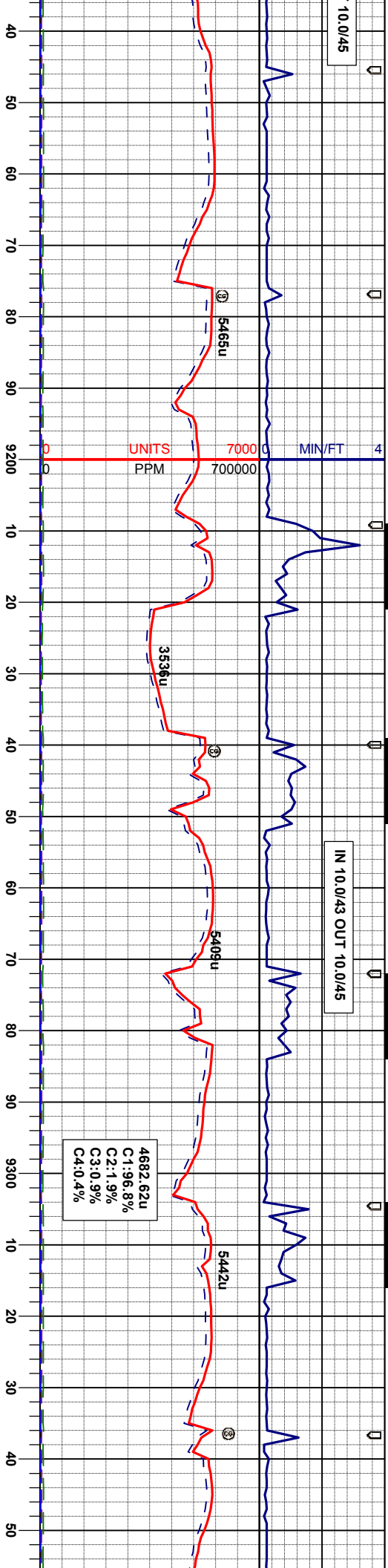




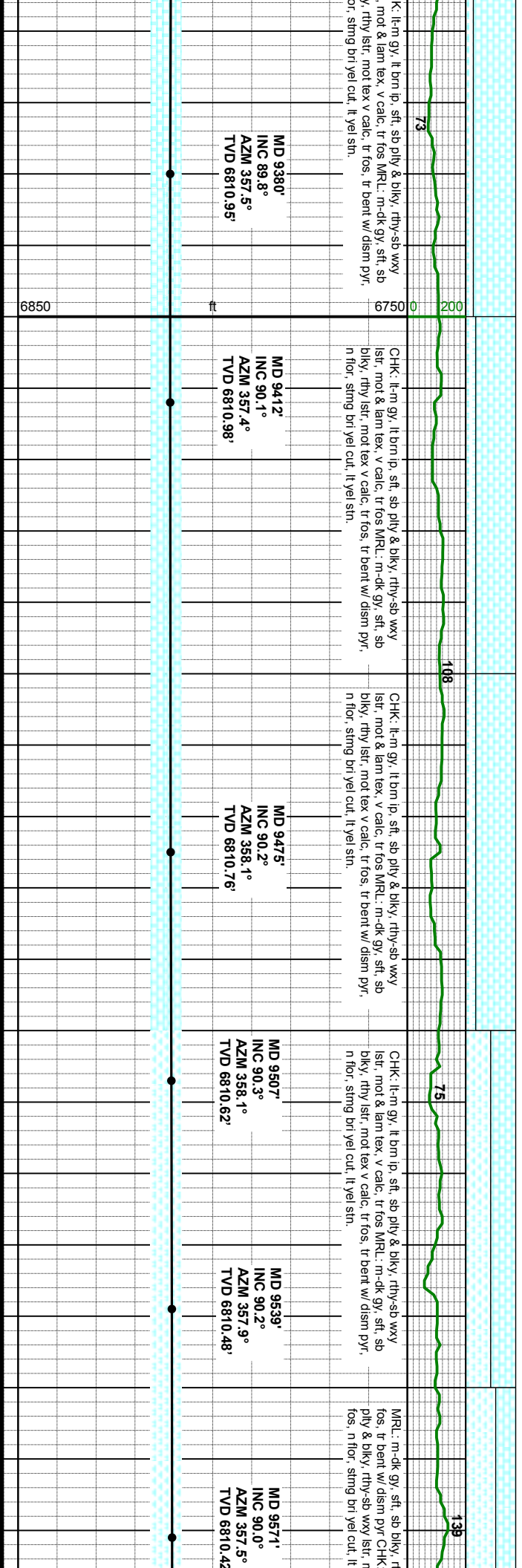
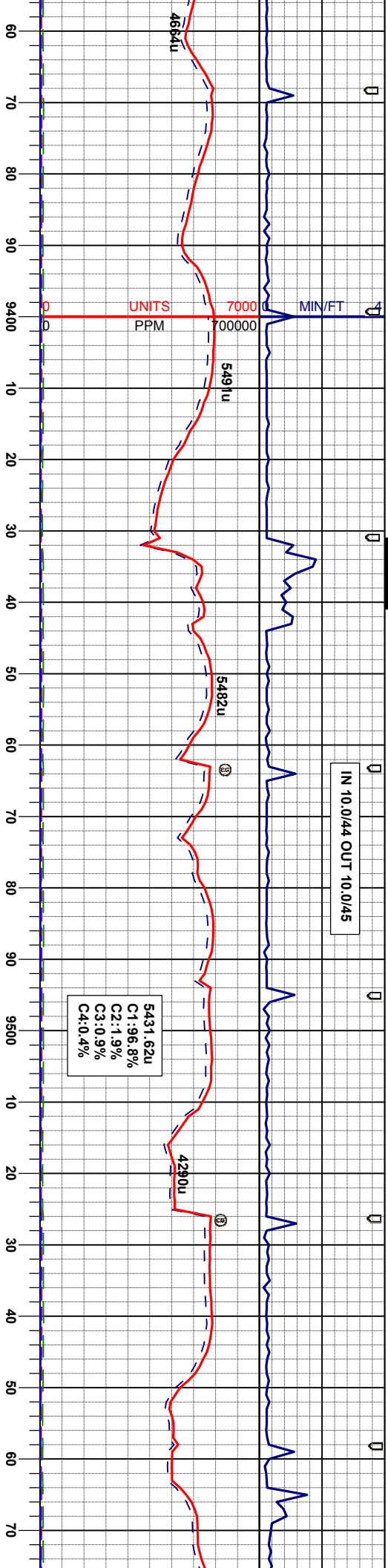




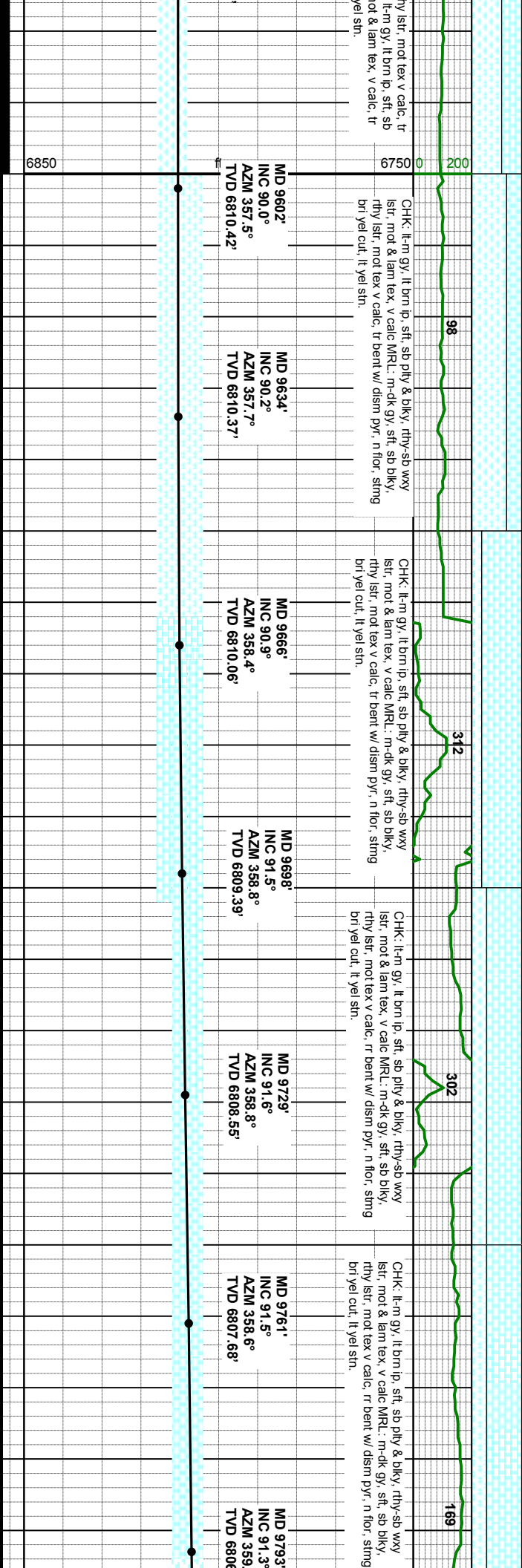
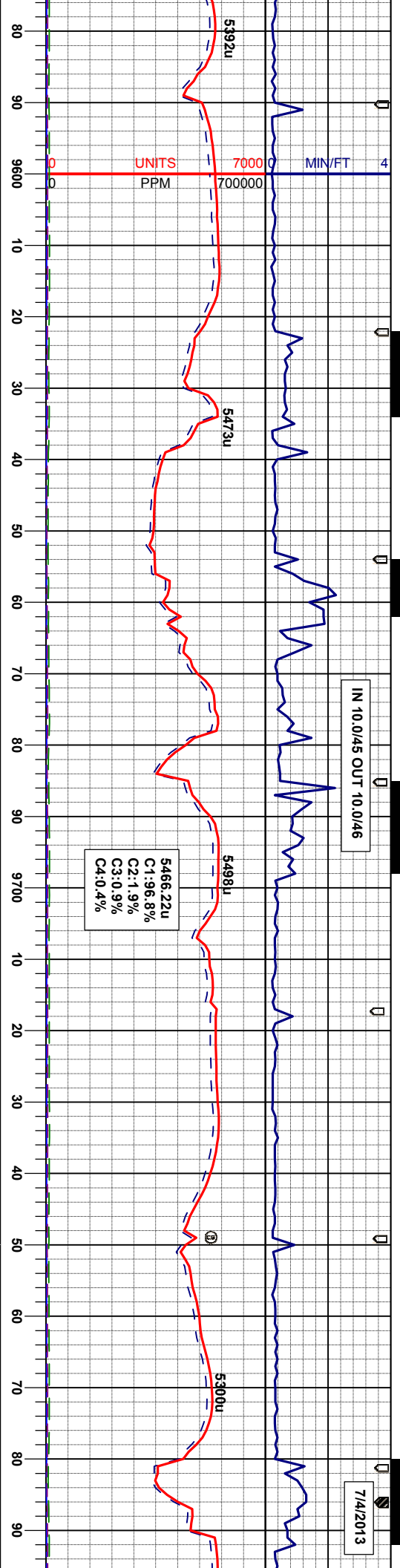




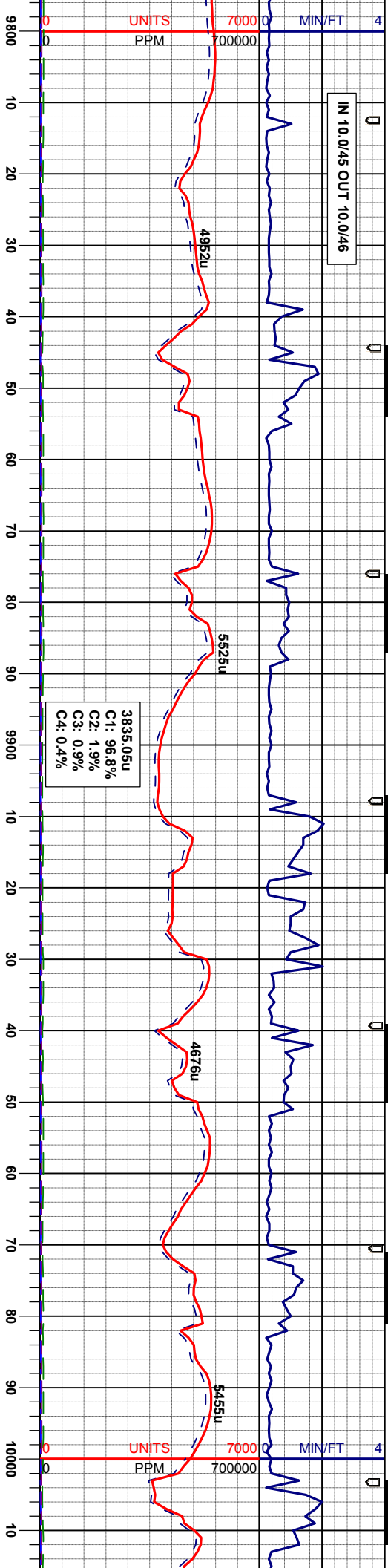




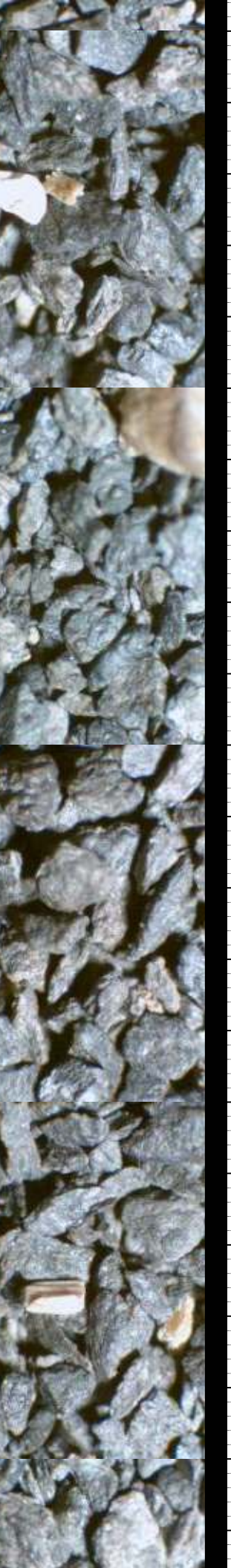






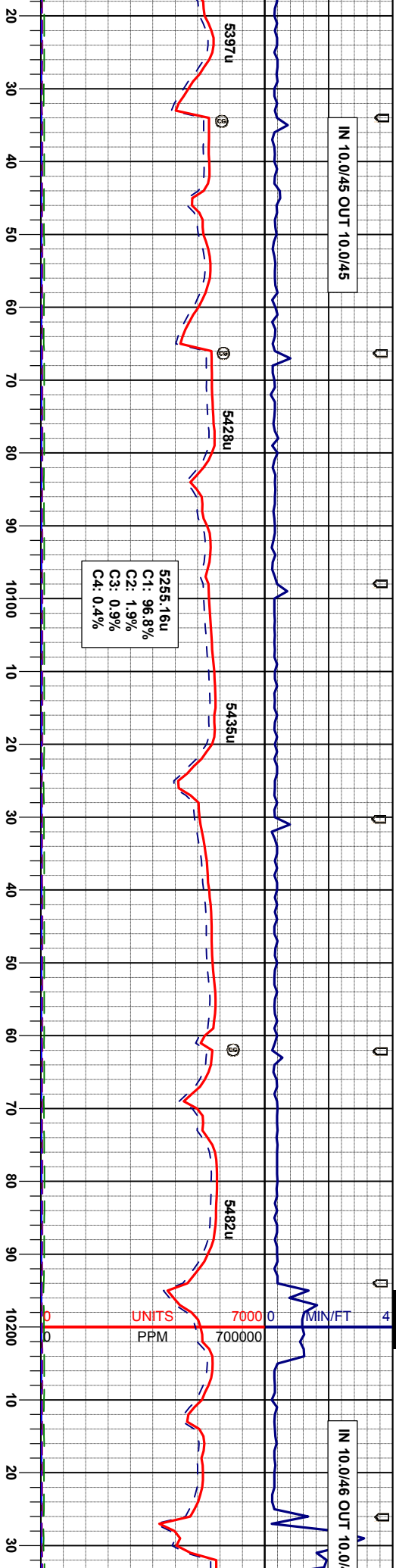


CHK: lt-m gy, lt brn ip, sft, sb pily & blkly, rthy-sb wxy lsfr, mot & lam tex, v calc MRL, m-dk gy, sft, sb blkly, rthy lsfr, mot tex v calc, rr bent w/ dism pyr, n flor, sting brl yel cut, lt yel sn.	MD 9825' INC 91.2° AZM 358.9° TVD 6806.20'
CHK: lt-m gy, lt brn ip, sft, sb pily & blkly, rthy-sb wxy lsfr, mot & lam tex, v calc MRL, m-dk gy, sft, sb blkly, rthy lsfr, mot tex v calc, rr bent w/ dism pyr, n flor, sting brl yel cut, lt yel sn.	MD 9856' INC 90.8° AZM 359.1° TVD 6805.66'
CHK: lt-m gy, lt brn ip, sft, sb pily & blkly, rthy-sb wxy lsfr, mot & lam tex, v calc MRL, m-dk gy, sft, sb blkly, rthy lsfr, mot tex v calc, rr bent w/ dism pyr, n flor, sting brl yel cut, lt yel sn.	MD 9888' INC 90.4° AZM 359.5° TVD 6805.36'
MRL: m-dk gy, sft, sb blkly, rthy lsfr, mot tex v calc, rr bent CHK: lt-m gy, lt brn ip, sft, sb pily & blkly, rthy-sb wxy lsfr, mot & lam tex, v calc n flor, sting brl yel cut, lt yel sn.	MD 9920' INC 90.2° AZM 0.00° TVD 6805.19'
MRL: m-dk gy, sft, sb blkly, rthy lsfr, mot tex v calc, rr bent, tr xl calcite CHK: lt-m gy, lt brn ip, sft, sb pily & blkly, rthy-sb wxy lsfr, mot & lam tex, v calc n flor, sting brl yel cut, lt yel sn.	MD 9952' INC 90.3° AZM 1.2° TVD 6805.05'
MRL: m-dk gy, bent, tr xl calcite CHK: lt-m gy, lt lsfr, mot & lam	MD 9983' INC 90.0° AZM 1.9° TVD 6804.97'
MRL: m-dk gy, bent, tr xl calcite CHK: lt-m gy, lt lsfr, mot & lam	MD 1000' INC 89.9° AZM 1.9° TVD 6804.97'





IN 10.0/45 OUT 10.0/45



128

113

119

0

MD 10047'  
INC 89.3°  
AZM 2.1°  
TVD 6805.45'

MD 10079'  
INC 89.1°  
AZM 1.9°  
TVD 6805.89'

MD 10111'  
INC 88.8°  
AZM 1.6°  
TVD 6806.48'

MD 10143'  
INC 88.5°  
AZM 1.8°  
TVD 6807.23'

MD 10175'  
INC 88.2°  
AZM 1.6°  
TVD 6808.16'

MD 10206'  
INC 88.5°  
AZM 1.8°  
TVD 6809.05'

MD  
INC  
AZM  
TVD

MRL: m-dk. gy, sft, sb blk, rthy istr, mot tex v calc, r bent, tr xl calcite  
CHK: lt-m gy, lt brn ip, sft, sb ply & blk, rthy-sb wxy istr, mot & lam tex, v calc n flor, sting brn yel cut, lt yel sftn.

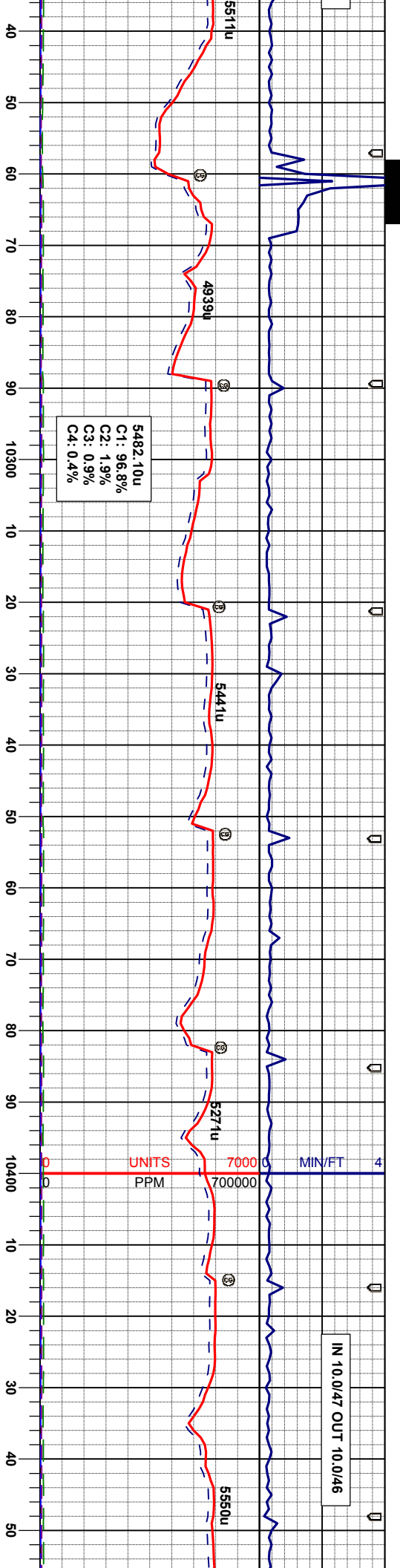
MRL: m-dk. gy, sft, sb blk, rthy istr, mot tex v calc, r bent, tr xl calcite  
CHK: lt-m gy, lt brn ip, sft, sb ply & blk, rthy-sb wxy istr, mot & lam tex, v calc n flor, sting brn yel cut, lt yel sftn.

CHK: lt-m gy, lt brn ip, sft, sb ply & blk, rthy-sb wxy istr, mot & lam tex, v calc, tr fos MRL: m-dk gy, sft, sb blk, rthy istr, mot tex v calc, tr fos, tr bent w/ dism pyr, n flor, sting brn yel cut, lt yel sftn.

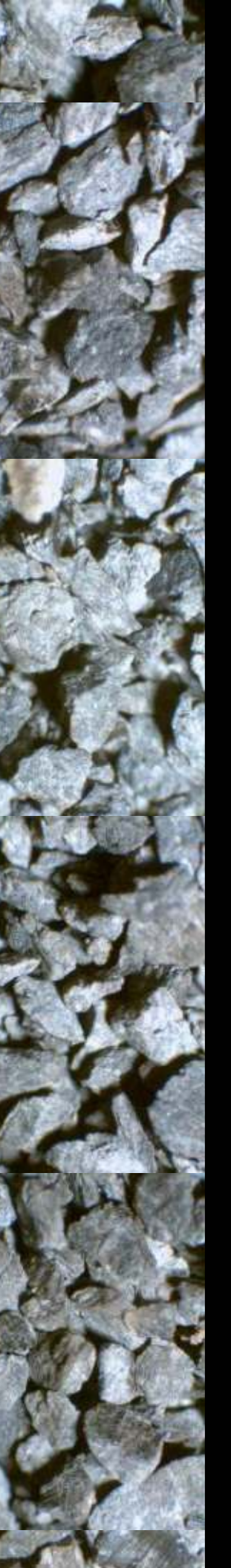
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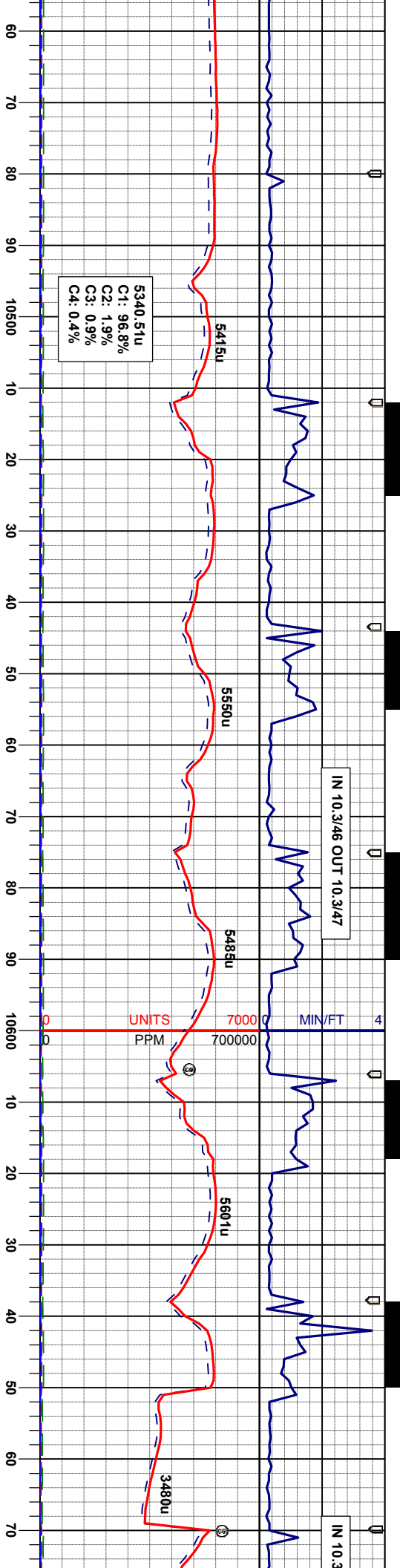






112	132	86	102
rthy-sb wxy -dk gy, sft, sb bent w/ dism	CHK: lt-m gy, lt brn lp, sft, sb ply & blk, rthy-sb wxy lsr, mot & lam tex, v calc, tr fos MRL: m-dk gy, sft, sb blk, rthy lsr, mot tex v calc, tr fos, tr gn bent w/ dism pyr, n flor, sting brn yel cut, lt yel sin.	CHK: lt-m gy, lt brn lp, sft, sb ply & blk, rthy-sb wxy lsr, mot & lam tex, v calc, tr fos MRL: m-dk gy, sft, sb blk, rthy lsr, mot tex v calc, tr fos, tr gn bent w/ dism pyr, n flor, sting brn yel cut, lt yel sin.	CHK: lt-m gy, lt brn lp, sft, sb ply & blk, rthy-sb wxy lsr, mot & lam tex, v calc, tr fos MRL: m-dk gy, sft, sb blk, rthy lsr, mot tex v calc, tr fos, tr gn bent w/ dism pyr, n flor, sting brn yel cut, lt yel sin.
MD 10238' INC 89.0° AZM 1.4° TVD 6809.75'	MD 10302' INC 89.6° AZM 1.6° TVD 6810.42'	MD 10365' INC 90.0° AZM 1.2° TVD 6810.69'	MD 10429' INC 90.7° AZM 1.1° TVD 6810.39'

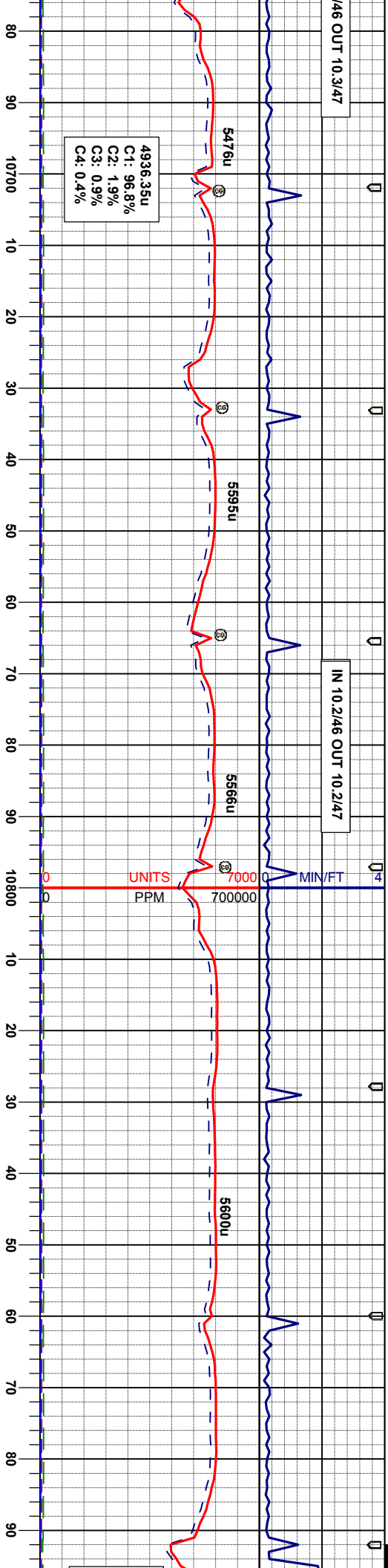




CHK: il-m gy, il brn ip, sft, sb pily & biky, rthy-sb wxy istr, mot & lam tex, v calc, tr fos MFL, m-dk gy, sft, sb biky, rthy istr, mot tex v calc, tr fos, tr gn bent w/ dism pyr, n floor, sting brn yel cul, il yel sin.	MD 10524' INC 91.6° AZM 1.1° TVD 6808.48'	MD 10555' INC 91.1° AZM 0.9° TVD 6807.75'	MD 10587' INC 90.6° AZM 0.4° TVD 6807.27'	MD 10619' INC 89.8° AZM 0.2° TVD 6807.16'	MD 10651' INC 89.3° AZM 0.5° TVD 6807.41'
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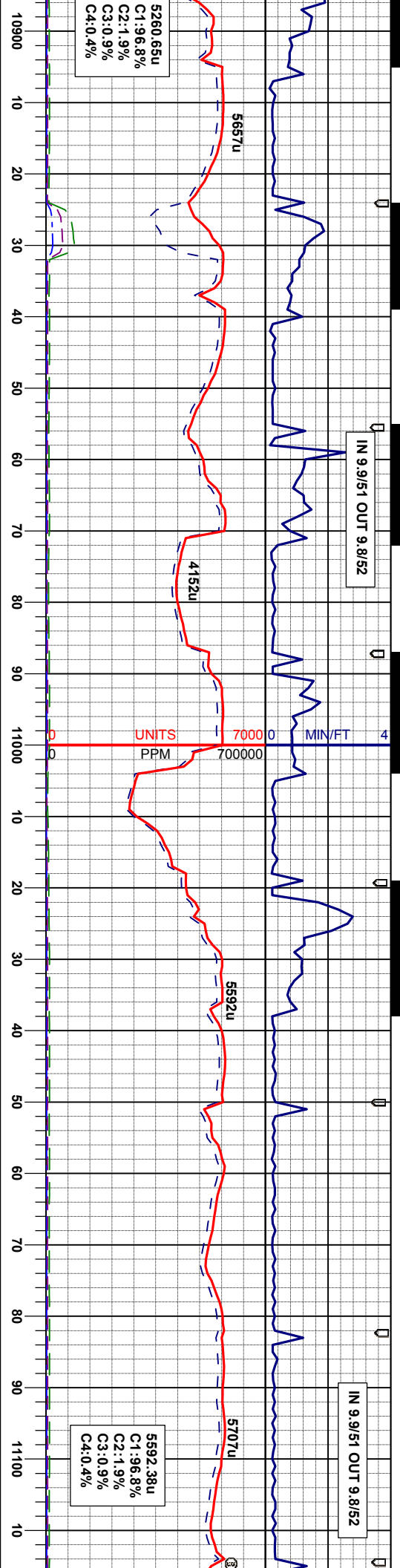






96	CHK: lt-m gy, lt brn lp, sft, sb pily & biky, rthy-sb wxy lstr, mot & lam tex v calc, tr fos MRL: m-dk gy, sft, sb biky, rthy lstr, mot tex v calc, tr fos, n flor, sting brt yel cut, lt yel sin.	MD 10682' INC 89.4° AZM 0.5° TVD 6807.77'	MD 10714' INC 89.8° AZM 0.7° TVD 6807.99'	MD 10746' INC 89.9° AZM 0.4° TVD 6808.07'	MD 10777' INC 90.5° AZM 0.2° TVD 6807.96'	MD 10809' INC 90.7° AZM 0.0° TVD 6807.63'	MD 10841' INC 91.3° AZM 0.0° TVD 6807.07'	MD 10873' INC 92.1° AZM 0.0° TVD 6805.89'
85	CHK: lt-m gy, lt brn lp, sft, sb pily & biky, rthy-sb wxy lstr, mot & lam tex, v calc, tr fos MRL: m-dk gy, sft, sb biky, rthy lstr, mot tex v calc, tr fos, n flor, sting brt yel cut, lt yel sin.							
110	CHK: lt-m gy, lt brn lp, sft, sb pily & biky, rthy-sb wxy lstr, mot & lam tex, v calc, tr fos MRL: m-dk gy, sft, sb biky, rthy lstr, mot tex v calc, tr fos, n flor, sting brt yel cut, lt yel sin.							





5260.65u  
C1:96.8%  
C2:1.9%  
C3:0.9%  
C4:0.4%

5592.38u  
C1:96.8%  
C2:1.9%  
C3:0.9%  
C4:0.4%

CHK: lt-m gy, lt brn ip, sft, sb ply & blk, rthy-sb wxy  
lstr, mot & lam tex, v calc, tr fos MRL, m-dk gy, sft, sb  
blk, rthy lstr, mot tex v calc, tr fos, n flor, sting brn yel  
cut, lt yel sn.

CHK: lt-m gy, lt brn ip, sft, sb ply & blk, rthy-sb wxy  
lstr, mot & lam tex, v calc, tr fos MRL, m-dk gy, sft, sb  
blk, rthy lstr, mot tex v calc, tr fos, n flor, sting brn yel  
cut, lt yel sn.

CHK: lt-m gy, lt brn ip, sft, sb ply & blk, rthy-sb wxy  
lstr, mot & lam tex, v calc, tr fos MRL, m-dk gy, sft, sb  
blk, rthy lstr, mot tex v calc, tr fos, n flor, sting brn yel  
cut, lt yel sn.

CHK: lt-m gy, lt brn ip, sft, sb ply & blk, rthy-sb wxy  
lstr, mot & lam tex, v calc, tr fos MRL, m-dk gy, sft, sb  
blk, rthy lstr, mot tex v calc, tr fos, n flor, sting brn yel  
cut, lt yel sn.

CHK: lt-m gy, lt brn ip, sft, sb ply & blk, rthy-sb wxy  
lstr, mot & lam tex, v calc, tr fos MRL, m-dk gy, sft, sb  
blk, rthy lstr, mot tex v calc, tr fos, n flor, sting brn yel  
cut, lt yel sn.

MD 10904'  
INC 92.2°  
AZM 359.8°  
TVD 6804.72'

MD 10936'  
INC 91.9°  
AZM 359.3°  
TVD 6803.58'

MD 10968'  
INC 91.5°  
AZM 359.1°  
TVD 6802.63'

MD 10999'  
INC 90.7°  
AZM 359.3°  
TVD 6802.04'

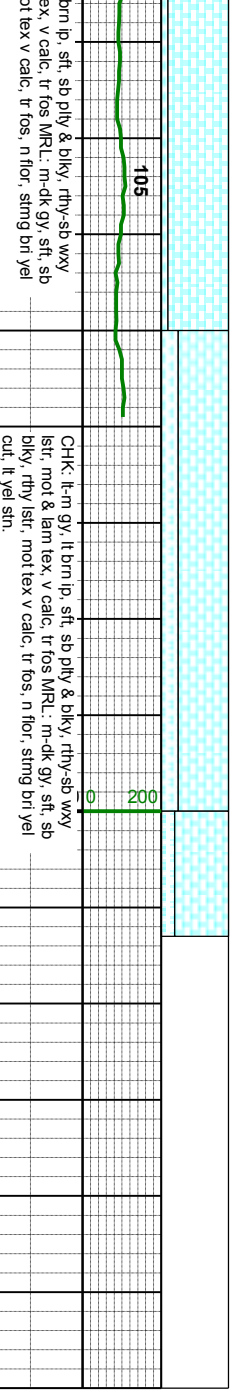
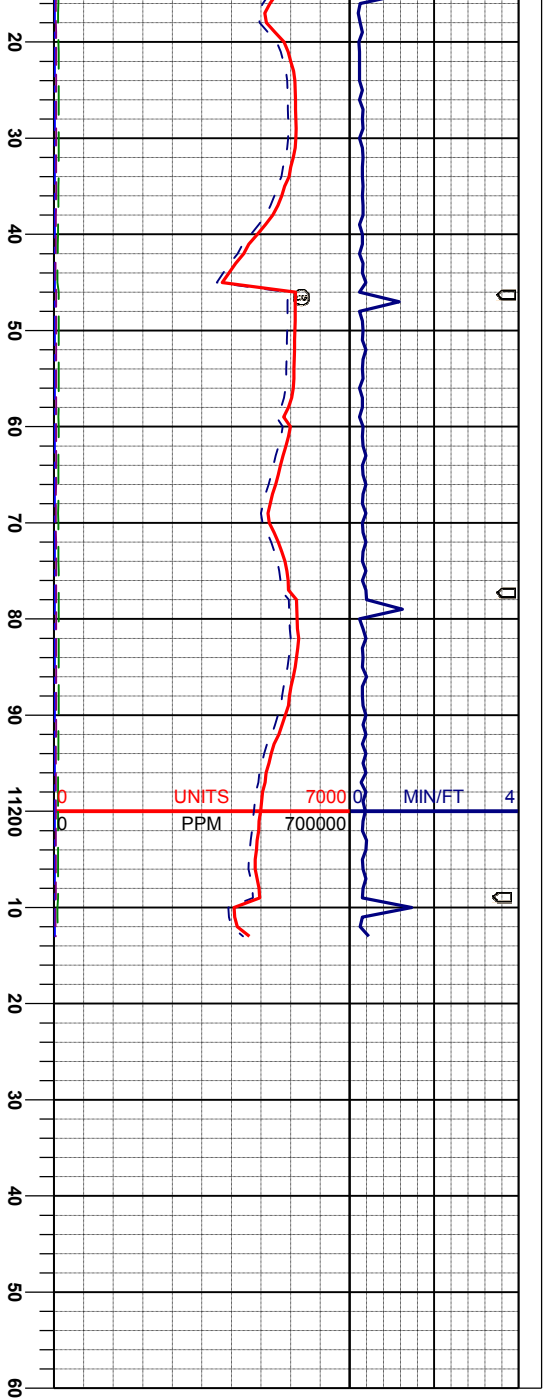
MD 11031'  
INC 90.2°  
AZM 359.3°  
TVD 6801.78'

MD 11063'  
INC 90.4°  
AZM 359.5°  
TVD 6801.62'

MD 11095'  
INC 91.0°  
AZM 359.3°  
TVD 6801.23'



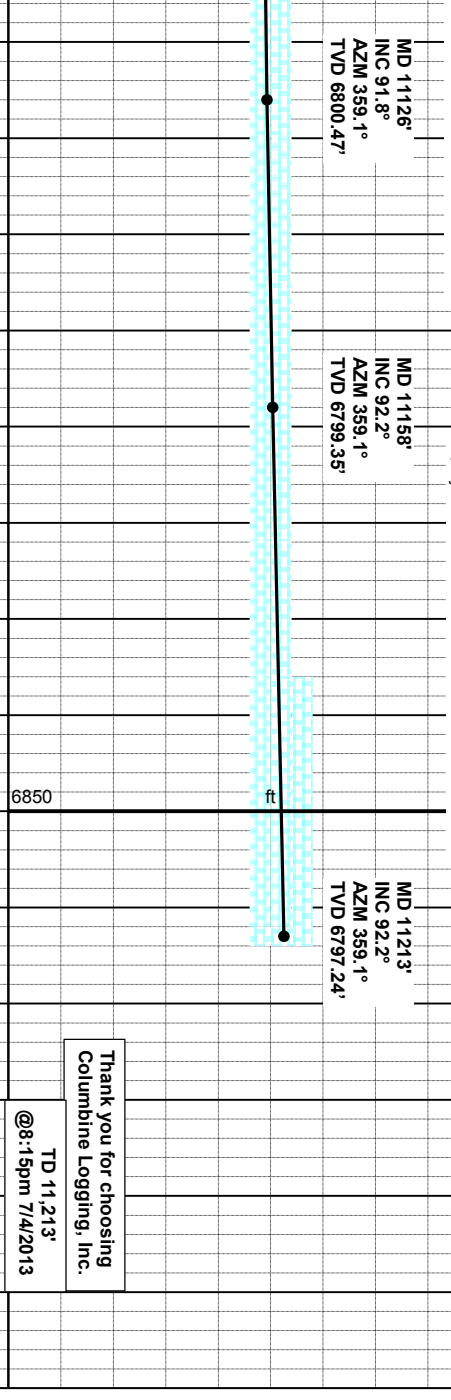




MD 11126'  
INC 91.8°  
AZM 359.1°  
TVD 6800.47'

MD 11158'  
INC 92.2°  
AZM 359.1°  
TVD 6799.35'

MD 11213'  
INC 92.2°  
AZM 359.1°  
TVD 6797.24'



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