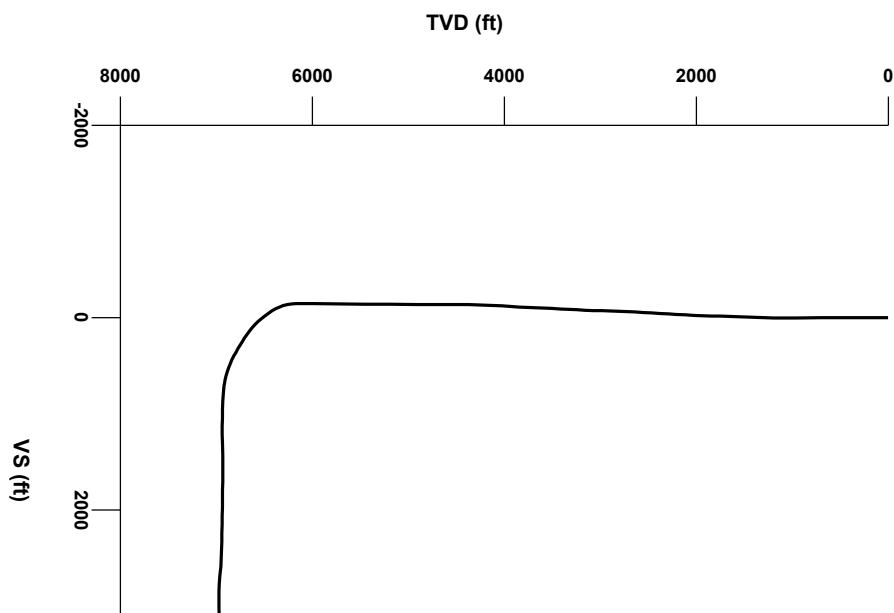


LOG created using LPLOT VH Version 3.0, May 18, 2013, Copyright (C) 1999-2009 Pason Systems Corp.

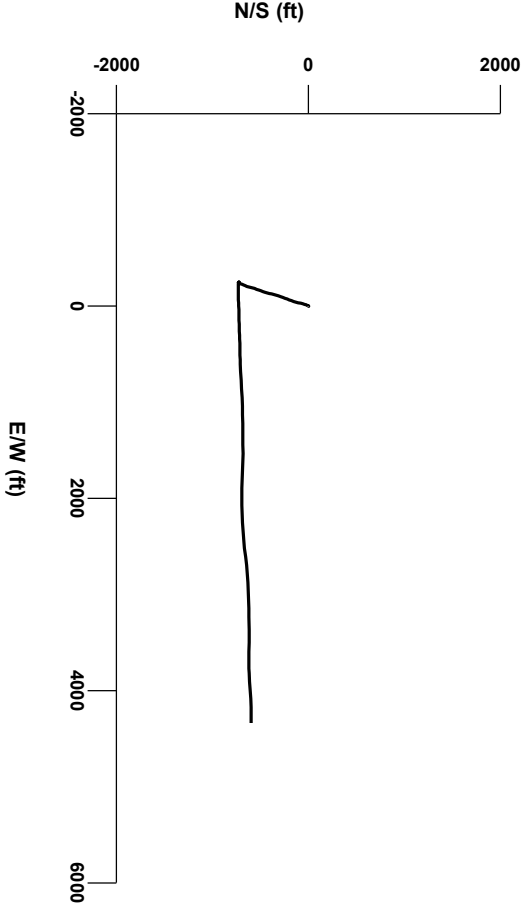
**OPERATOR:** NOBLE ENERGY INC.  
**WELL:** FEUERSTEIN I28-63-1HN  
**LOCATION:** SEC28, T6N, R66W  
**COUNTY:** WELD  
**STATE:** COLORADO  
**SPOT:** 1721' FSL, 311' FWL  
**ELEVATION:** GE: 4724', KB: 7440'  
**FIELD:** WATTENBERG  
**SPUD DATE:** 05/07/2013  
**TD DATE:** 05/17/2013  
**DATES LOGGED:** 05/09/2013 - 05/17/2013  
**DEPTHS LOGGED:** 1000' - 11288'  
**LOGGERS:** CHRIS WILLATT, CHRIS VENTURINO  
**DRILLING FLUID:** LSND  
**DRILLING RIG:** PRECISION 829  
**API:** 05-123-36661  
**LOG TYPE:** HORIZONTAL  
**SCALE:** 1:240 (5 inches per 100 feet)  
**REMARKS:** WELLSITE GEOLOGICAL SERVICES PROVIDED BY COLUMBINE LOGGING INC.

**LOG CONTINUES FROM FILE:** Feuerstein I28-63-1HN VERT.lplot



Survey Elevation

Survey Plan



4000

6000

Chalk

Marl

Shaly Sandstone

Silty Shale

Connection

Connection Gas

Midnight Depth

Normal Fault

GAS	
0	UNITS 5000
C1	
0	PPM 500000
C2	
0	PPM 500000
C3	
0	PPM 500000
C4	
0	PPM 500000

ROP	
0	MIN/FT 600
5/11/2013	

DEPTH (FEET)

6200

10

20

30

40

50

60

70

80

90

6300

10

20

397.0u

191.4u

246.0u

226.7u

MUD WT 9.85 V/S 38

CUTTINGS LITHOLOGY

GAMMA

0

API 200

26

106

118

COLUMBINE LOGGING INC.

RIGGED UP ON 5/9/2013

MANNED 2-PERSON LOGGING

WITH BLOODHOUND GAS

CHROMATOGRAPH UNIT #0131

BIT #2

Bit: 8.75"

Manufacturer: Smith

Model: SDI 611

Serial Number: JG9981

Nozzles: 3x13, 3x14

In @ 635' MD

BEGIN 50' SAMPLES

50' DESCRIPTIONS

MD 6268'

INC 0.88°

AZI 109.91°

TVD 6170.7'

70% SLT YSH: mgy - dkgy - sft - mod frm, sbndr -

sbply, occ sbbkly, shy-sily tex, ls ss

30% SHYSS: lgy - dkgy, vt - mgr, sbndr - sbang, p -

mod srt, mod sft - mod frm, arg mix, p-mod cnt, occ

biot

MD 6313'

INC 5.45°

AZI 112.67°

TVD 6215.6'

70% SLT YSH: mgy - dkgy - sft -

sbply, occ sbbkly, shy-sily tex, t

30% SHYSS: lgy - dkgy, vt - mg

mod srt, mod sft - mod frm, arg

biot

OIL SHOWS

TFG

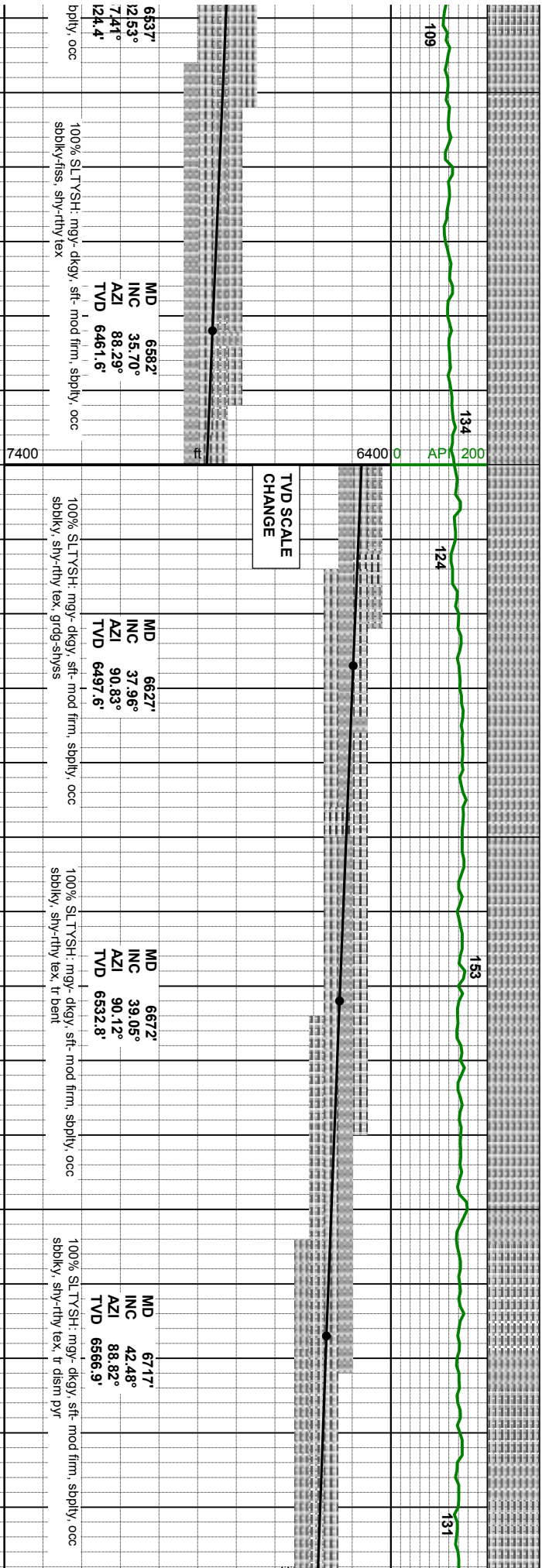
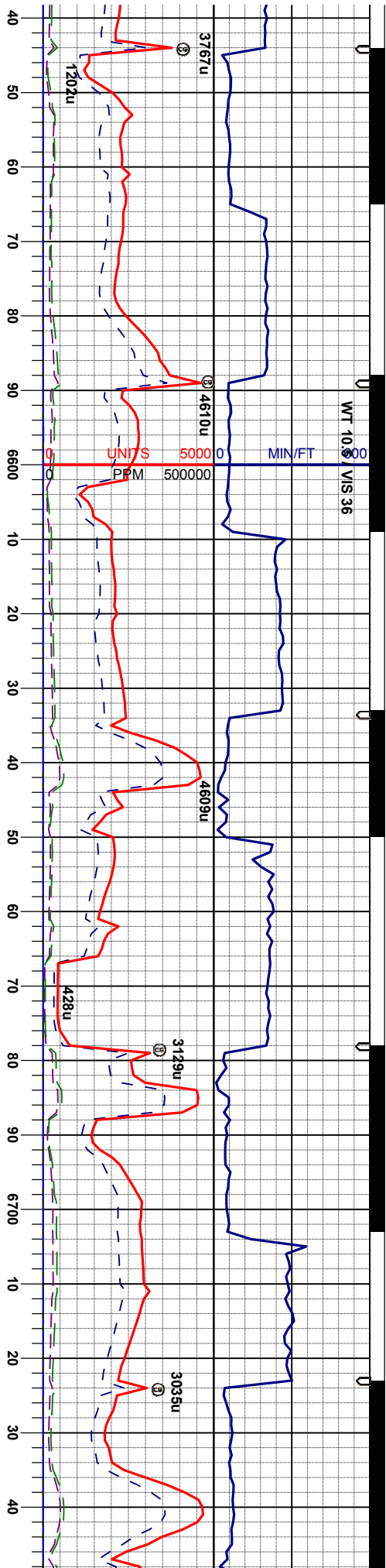
7000

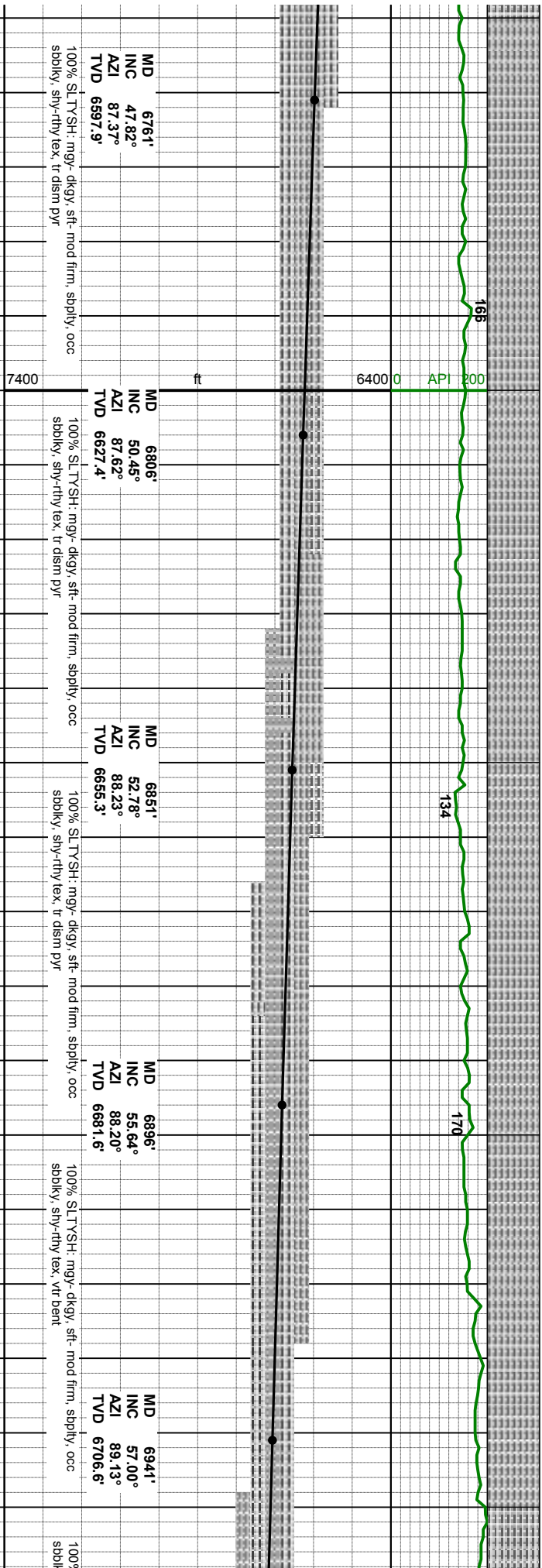
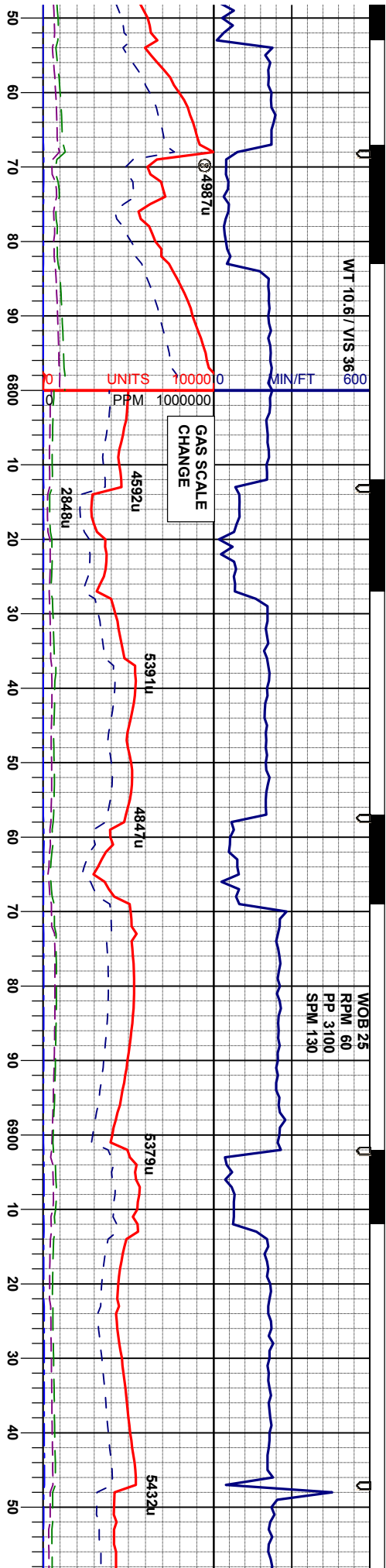
6000

SAMPLE PHOTOS

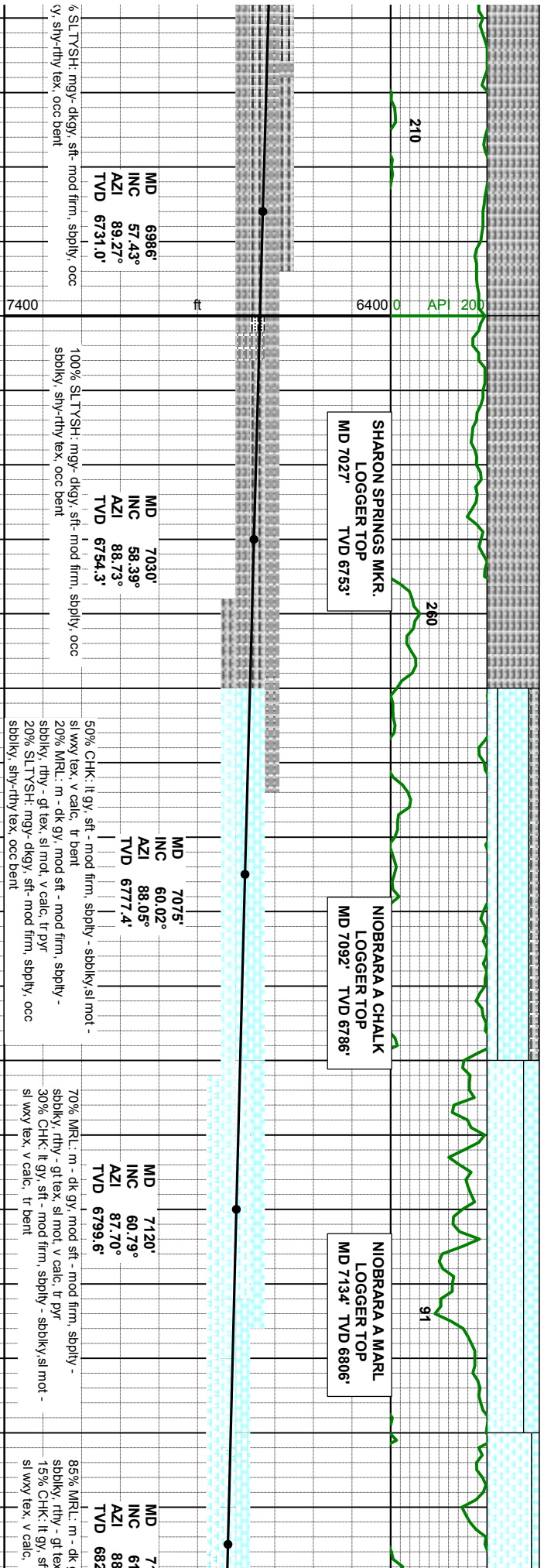
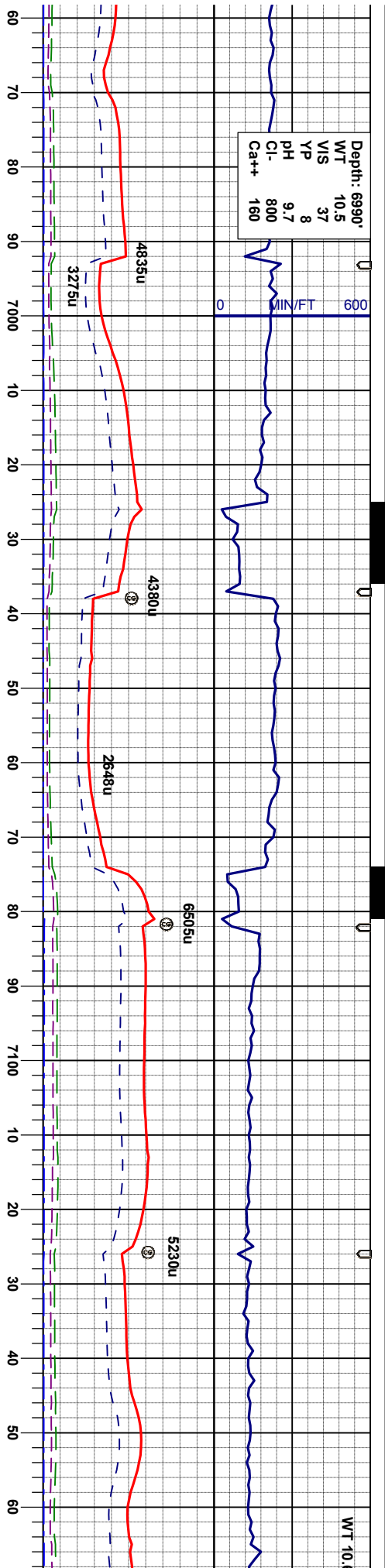


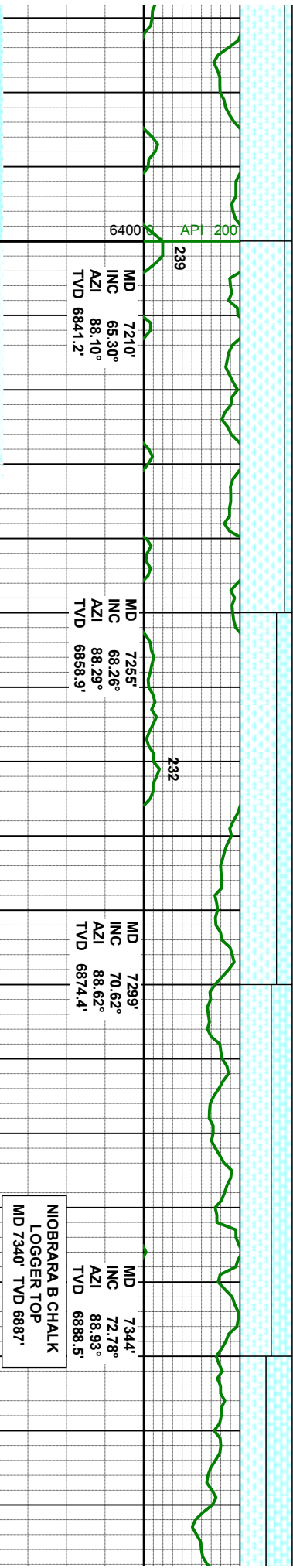
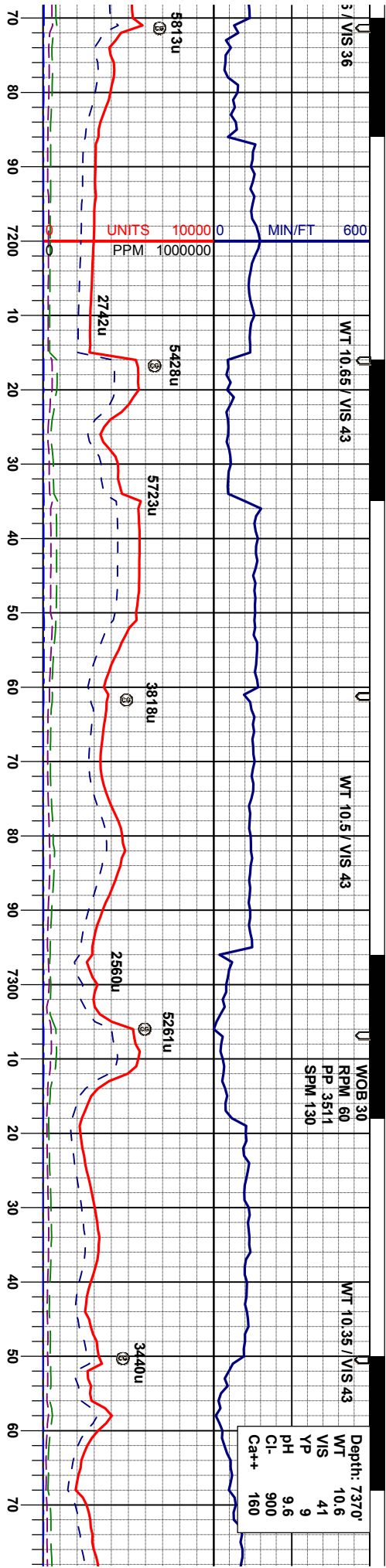












PIPE STUCK @ 7362' MD  
22:00 HRS, 5/11/2013  
RESUMED DRILLING @ 737  
15:43 HRS, 5/12/2013

85% MRL: m - dk gy, mod sft - mod firm, sbply -  
sbply, rthy - gt tex, sl mot, v calc, tr pyr  
15% CHK: lt gy, sft - mod firm, sbply - sbply, sl mot -  
sl wxy tex, v calc, tr bent

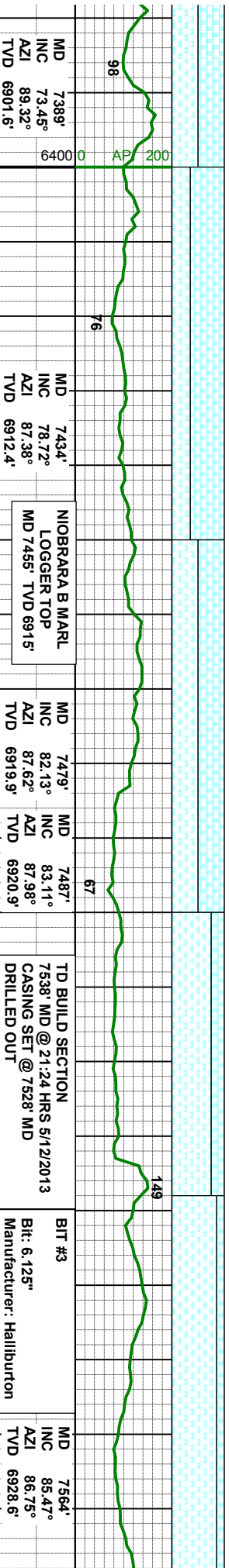
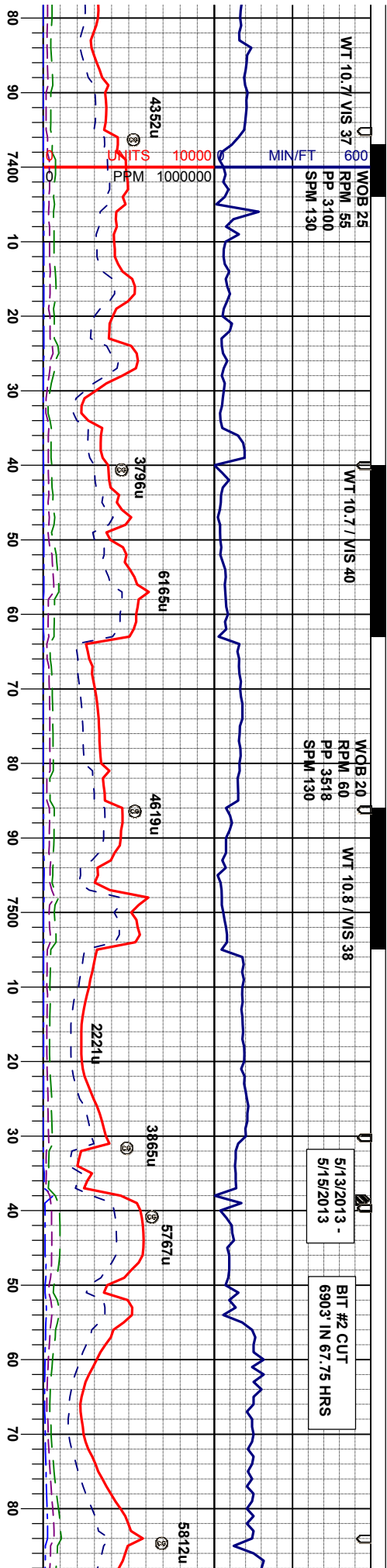
70% MRL: m - dk gy, mod sft - mod firm, sbply -  
sbply, rthy - gt tex, sl mot, v calc, tr pyr  
30% CHK: lt gy, sft - mod firm, sbply - sbply, sl mot -  
sl wxy tex, v calc, tr bent

60% MRL: m - dk gy, mod sft - mod firm, sbply -  
sbply, rthy - gt tex, sl mot, v calc, tr pyr  
40% CHK: lt gy - mgy, sft - mod firm, sbply - sbply, sl  
mot, sl wxy - rthy tex, v calc, tr bent

50% MRL: m - dk gy, mod sft -  
sbply, rthy - gt tex, sl mot, v calc  
50% CHK: lt gy - mgy, sft - mod  
mot, sl wxy - rthy tex, v calc, tr b







NOBARRA B MARL  
LOGGER TOP  
MD 7455' TVD 6915'

TD BUILD SECTION  
7538' MD @ 21:24 HRS 5/12/2013  
CASING SET @ 7528' MD  
DRILLED OUT  
@ 20:48 HRS, 5/15/2013

BIT #3  
Bit: 6.125"  
Manufacturer: Halliburton  
Model: HDBS FXD54  
Serial Number: 12101508  
Nozzles: 5x11  
In @ 7538' MD

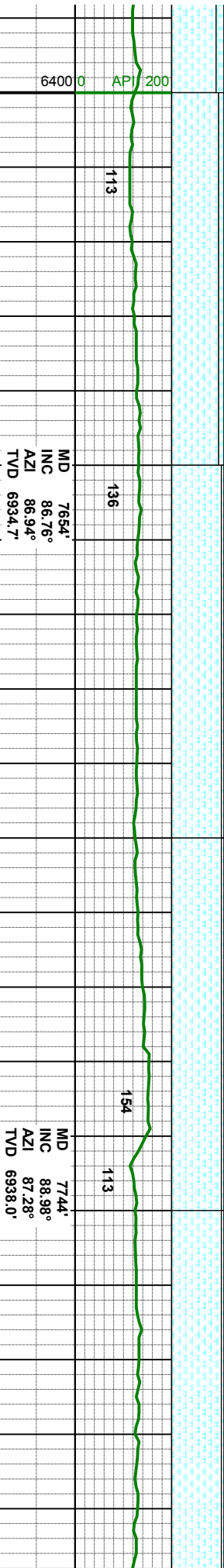
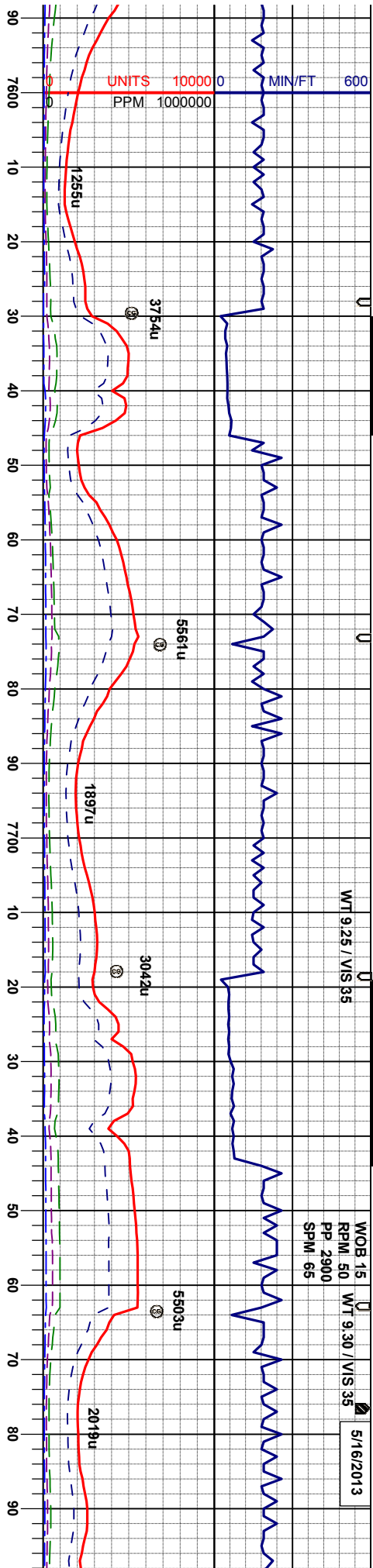
65% CHK: lt gy - mgy, sft - mod firm, sbply - sbply, sl  
mot, sl wxy - rthy tex, v calc, tr bent  
35% MRL: m - dk gy, mod sft - mod firm, sbply -  
sbply, rthy - gt tex, sl mot, v calc, tr pyr, tr fos

50% CHK: lt gy - mgy, sft - mod firm, sbply - sbply, sl  
mot, sl wxy - rthy tex, v calc, tr bent  
50% MRL: m - dk gy, mod sft - mod firm, sbply -  
sbply, rthy - gt tex, sl mot, v calc, tr pyr, tr fos

75% MRL: m - dk gy, mod sft - mod firm, sbply -  
sbply, rthy - gt tex, sl mot, v calc, tr pyr, tr fos  
25% CHK: lt gy - mgy, sft - mod firm, sbply - sbply, sl  
mot, sl wxy - rthy tex, v calc, tr bent

85% MRL: m - dk gy, mod sft - mod firm, sbply -  
sbply, rthy - gt tex, sl mot, v calc, tr pyr, tr fos  
15% CHK: lt gy - mgy, sft - mod firm, sbply - s  
wxy tex, v calc, tr bent

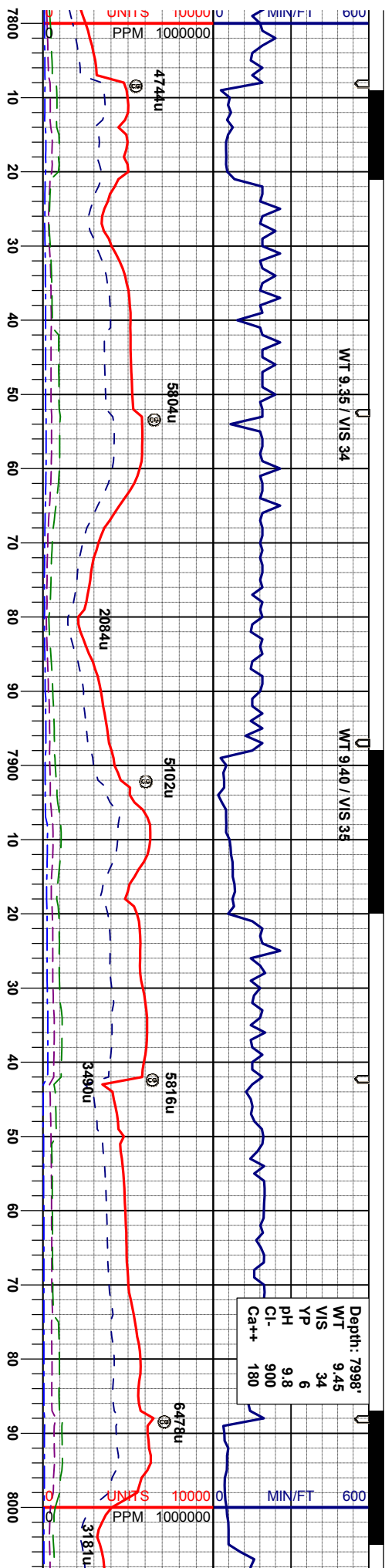




90% MRL: m - dk gy, mod sft - mod firm, sbply - sbdkly, rthy - gt tex, sl mot, v calc, tr pyr, tr fos	95% MRL: m - dk gy, mod sft - mod firm, sbply - sbdkly, rthy - gt tex, sl mot, v calc, tr pyr, tr fos	95% MRL: m - dk gy, mod sft - mod firm, sbply - sbdkly, rthy - gt tex, sl mot, v calc, tr pyr, tr fos	95% MRL: m - dk gy, mod sft - mod firm, sbply - sbdkly, rthy - gt tex, sl mot, v calc, tr pyr, tr fos
10% CHK: lt gy - mgy, sft - mod firm, sbply - sbdkly, sl wxy tex, v calc, tr bent	5% CHK: lt gy - mgy, sft - mod firm, sbply - sbdkly, sl wxy tex, v calc, tr bent	5% CHK: lt gy - mgy, sft - mod firm, sbply - sbdkly, sl wxy tex, v calc, tr bent	5% CHK: lt gy - mgy, sft - mod firm, sbply - sbdkly, sl wxy tex, v calc, tr bent







MD 7833'  
INC 89.08°  
AZI 86.94°  
TVD 6939.5'

135

114

MD 7923'  
INC 89.14°  
AZI 88.78°  
TVD 6940.9'

77

153

MD 7923'  
INC 89.14°  
AZI 88.78°  
TVD 6940.9'

77

153

95% MRL: m - dk gy, mod sft - mod firm, sbply -  
sbply, rthy - gt tex, sl mot, v calc, tr pyr, tr fos  
5% CHK: lt gy - mgy, sft - mod firm, sbply - sbply, sl  
wxy tex, v calc, tr bent

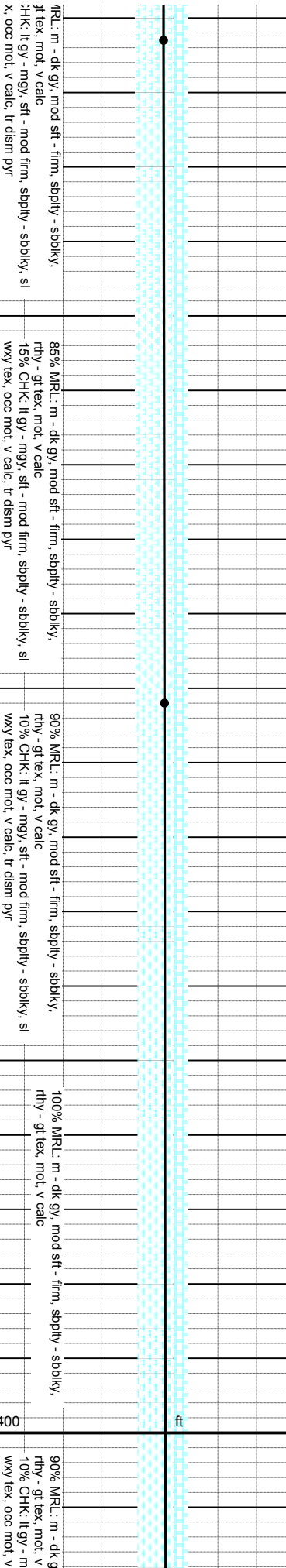
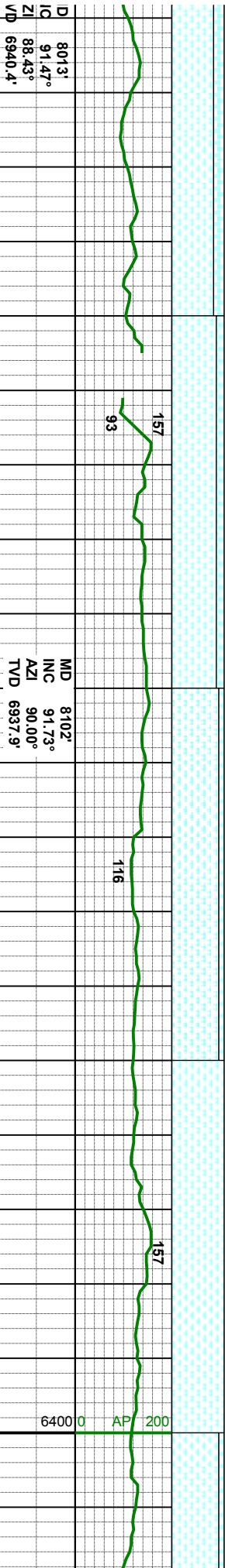
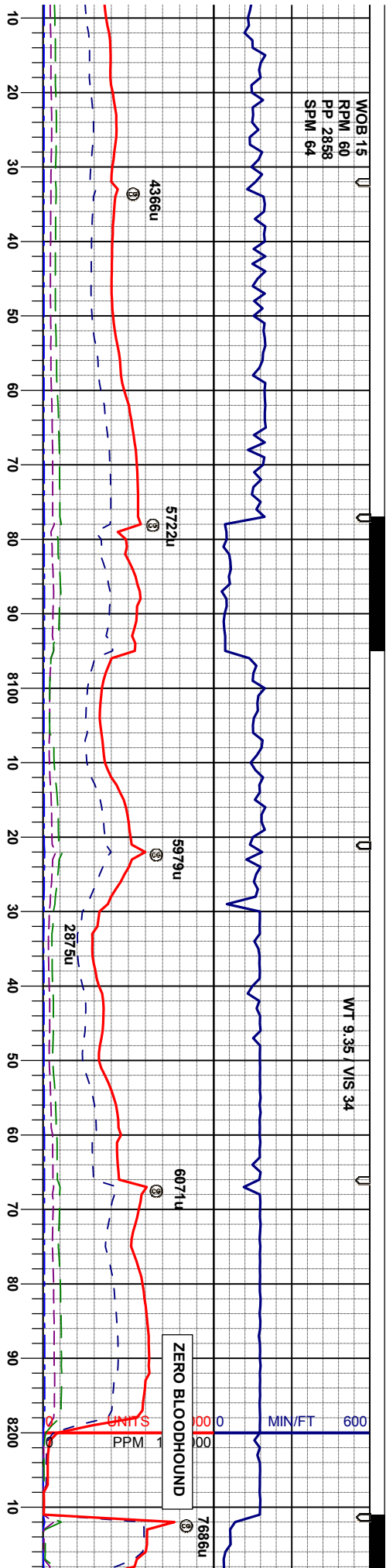
90% MRL: m - dk gy, mod sft - mod firm, sbply -  
sbply, rthy - gt tex, sl mot, v calc, tr pyr, tr fos  
10% CHK: lt gy - mgy, sft - mod firm, sbply - sbply, sl  
wxy tex, v calc, tr bent

95% MRL: m - dk gy, mod sft - mod firm, sbply -  
sbply, rthy - gt tex, sl mot, v calc, tr pyr, tr fos  
5% CHK: lt gy - mgy, sft - mod firm, sbply - sbply, sl  
wxy tex, v calc, tr bent

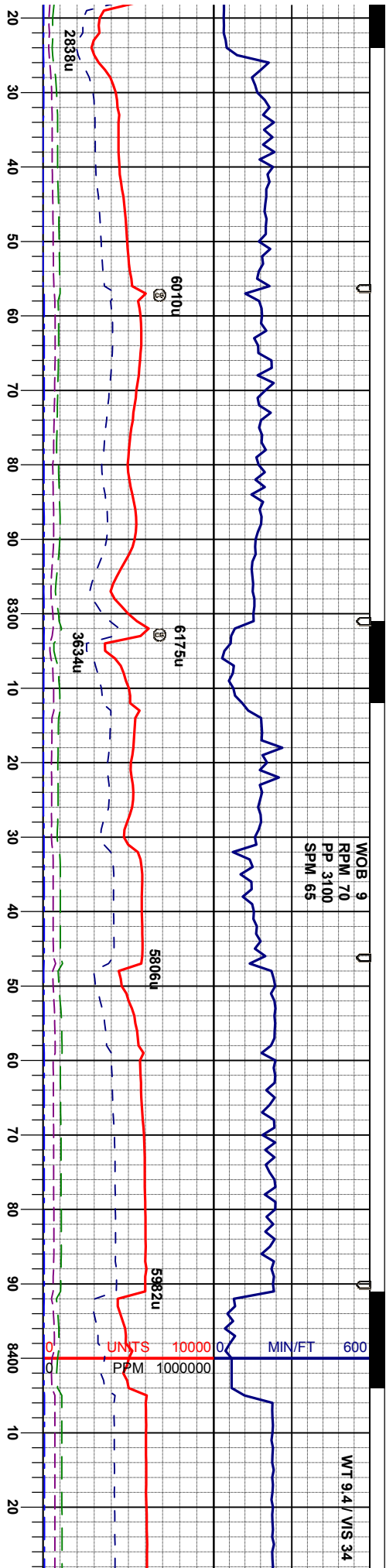
95% MRL: m - dk gy, mod sft - mod firm, sbply -  
sbply, rthy - gt tex, sl mot, v calc, tr pyr, tr fos  
5% CHK: lt gy - mgy, sft - mod firm, sbply - sbply, sl  
wxy tex, v calc, tr bent

80% MRL: m - dk gy, mod sft - mod firm, sbply -  
sbply, rthy - gt tex, sl mot, v calc, tr pyr, tr fos  
20% CHK: lt gy - mgy, sft - mod firm, sbply - sbply, sl  
wxy tex, v calc, tr bent









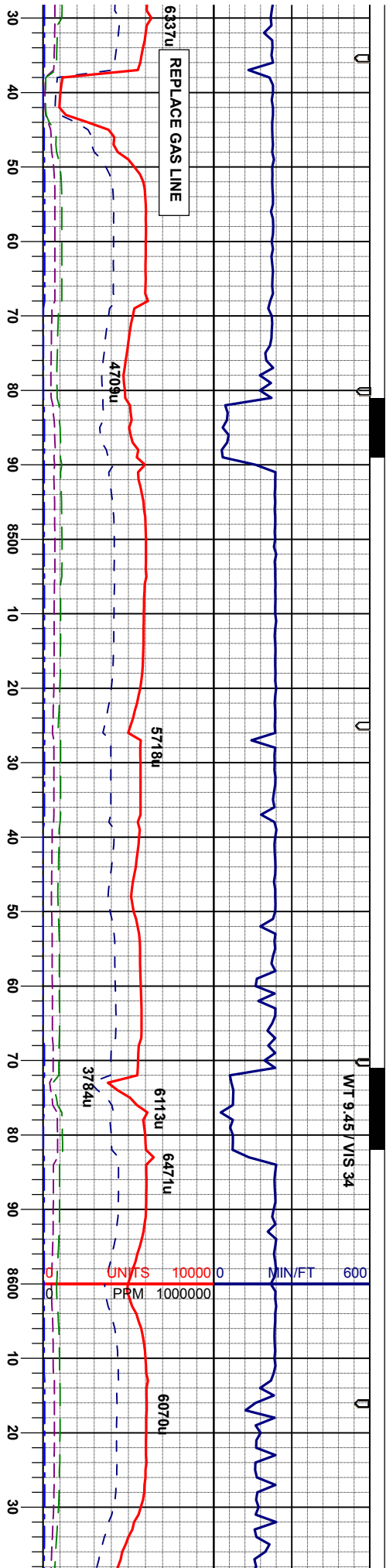
MD 8237  
INC 90.86°  
AZI 89.03°  
TVD 6934.9'

MD 8326  
INC 90.03°  
AZI 88.89°  
TVD 6934.2'

MD 8416  
INC 89.57°  
AZI 90.95°  
TVD 6934.5'

77	140	83	138	143
Y, mod sft - firm, splay - splay, calc	80% MRL: m - dk gy, mod sft - firm, splay - splay, rhy - gt tex, mot, v calc	80% MRL: m - dk gy, mod sft - firm, splay - splay, rhy - gt tex, mot, v calc	85% MRL: m - dk gy, mod sft - firm, splay - splay, rhy - gt tex, mot, v calc	80% MRL: m - dk gy, mod sft - firm, splay - splay, rhy - gt tex, mot, v calc
gy, sft - mod firm, splay - splay, sl	20% CHK: lt gy - mgy, sft - mod firm, splay - splay, sl	20% CHK: lt gy - mgy, sft - mod firm, splay - splay, sl	15% CHK: lt gy - mgy, sft - mod firm, splay - splay, sl	20% CHK: lt gy - mgy, sft - mod firm, splay - splay, sl
calc, tr dism pyr	wxy tex, occ mot, v calc, tr dism pyr, mod calcite, tr	wxy tex, occ mot, v calc, tr dism pyr, mod calcite, tr	wxy tex, occ mot, v calc, tr dism pyr, mod calcite, tr	wxy tex, occ mot, v calc, tr dism pyr, mod calcite, tr
	Inoc	Inoc	Inoc	Inoc





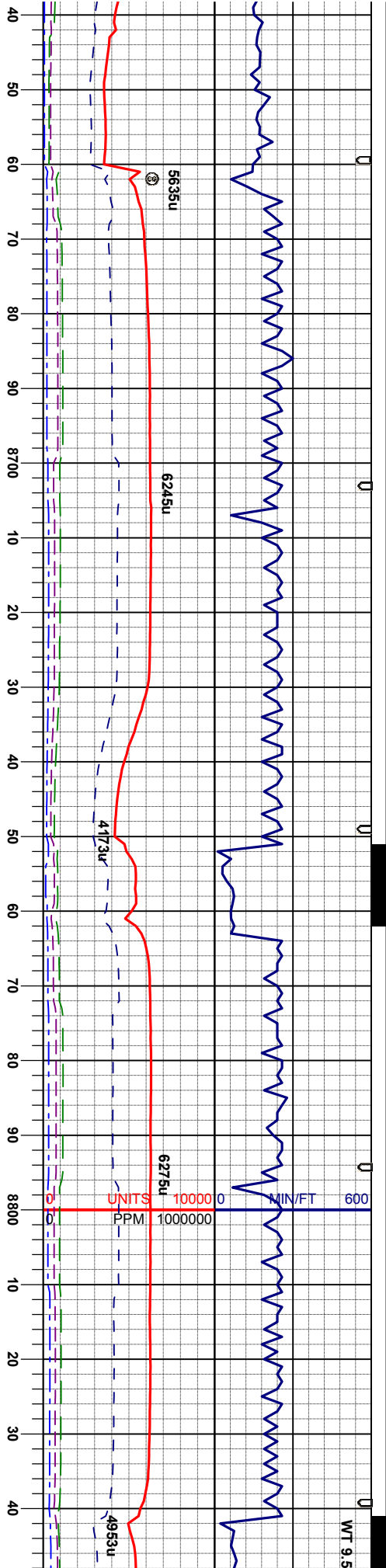
MD 8506'  
INC 89.29°  
AZI 92.05°  
TVD 6935.4'

MD 8595'  
INC 88.58°  
AZI 91.39°  
TVD 6937.1'

firm, spbly - spbly,	70% MRL: m - dk gy, mod sft - firm, spbly - spbly,	60% MRL: m - dk gy, mod sft - firm, spbly - spbly,	50% MRL: m - dk gy, mod sft - firm, spbly - spbly,	75% MRL: m - dk gy, mod sft - firm, spbly -
1 firm, spbly - spbly, sl	rtty - gt tex, mot, v calc	rtty - gt tex, mot, v calc	rtty - gt tex, mot, v calc	rtty - gt tex, mot, v calc
1 pyf, mod calcite, tr	30% CHK: lt gy - mgy, sft - mod firm, spbly - spbly, sl	40% CHK: lt gy - mgy, sft - mod firm, spbly - spbly, sl	50% CHK: lt gy - mgy, sft - mod firm, spbly - spbly, sl	25% CHK: lt gy - mgy, sft - mod firm, spbly -
	wxy tex, occ mot, v calc, tr disn pyf, mod calcite, tr	wxy tex, occ mot, v calc, tr disn pyf	wxy tex, occ mot, v calc, tr disn pyf	wxy tex, occ mot, v calc, tr disn pyf, mod ca
	Inoc			Inoc





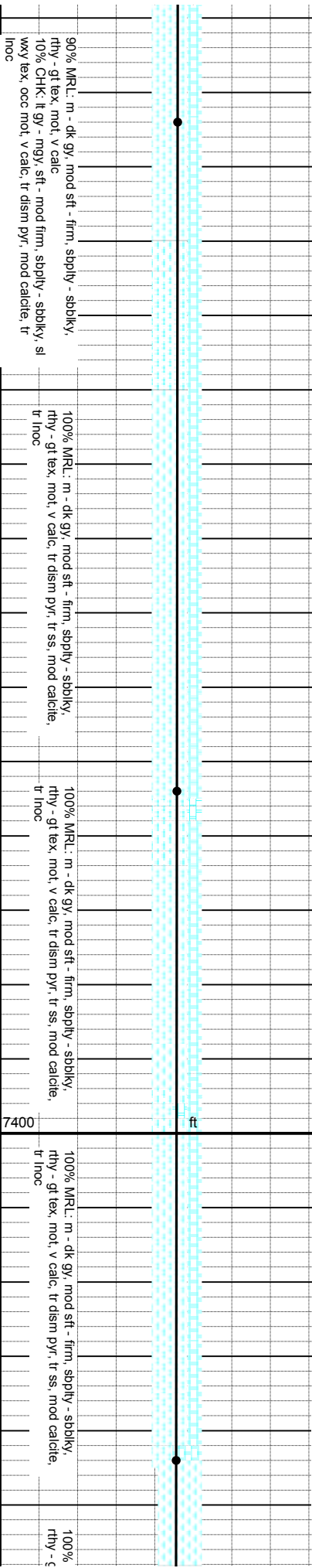
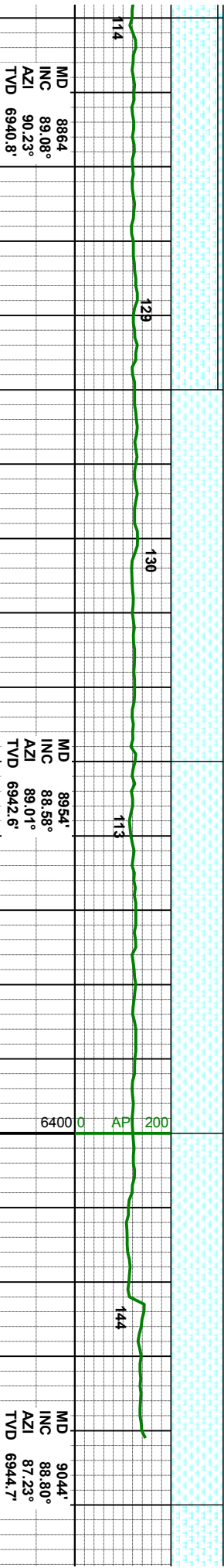
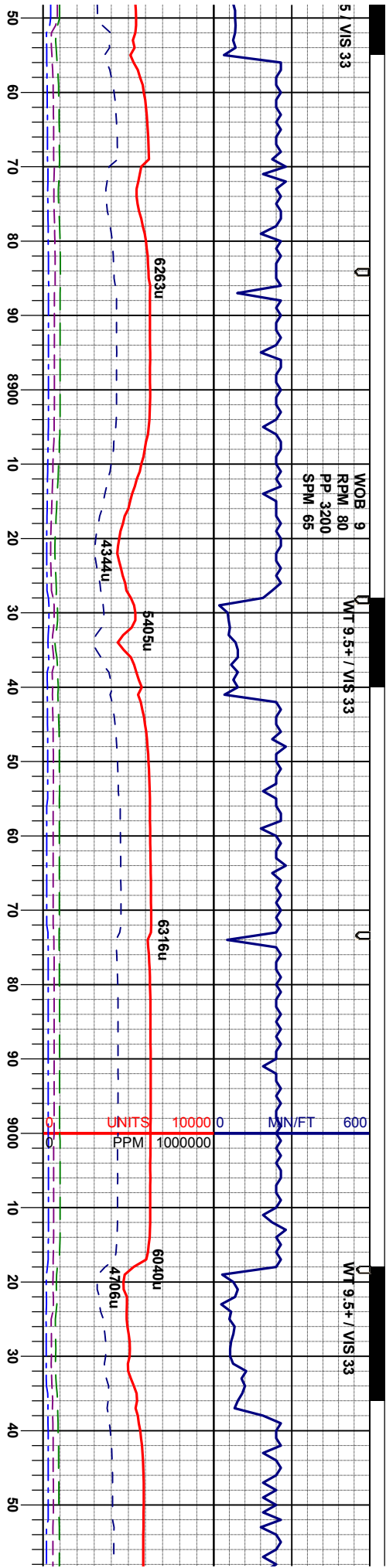


MD 8685'  
INC 89.97°  
AZI 92.81°  
TVD 6938.2'

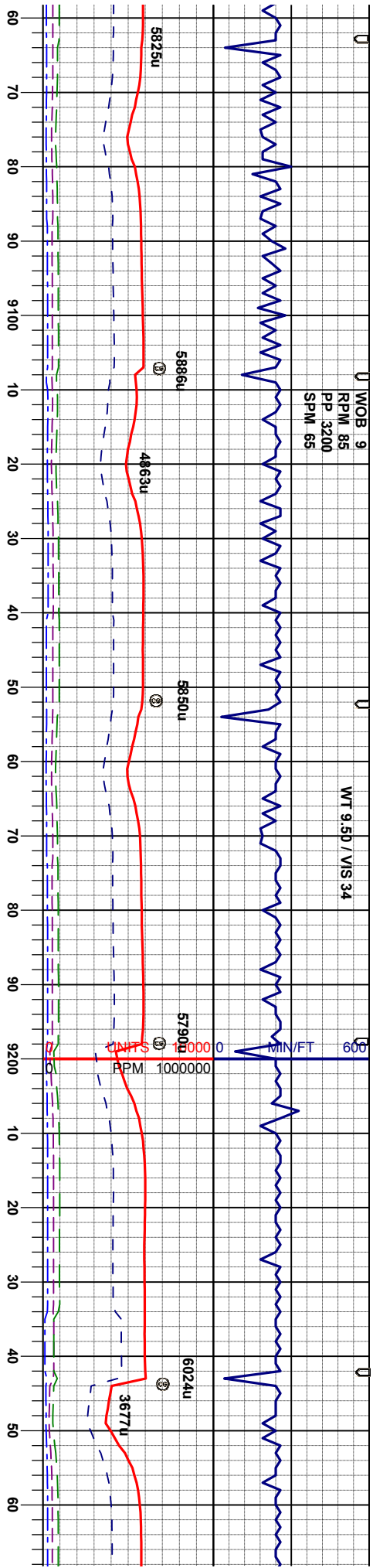
MD 8775'  
INC 88.83°  
AZI 91.21°  
TVD 6939.2'

sbdkly, sl icte, tr	80% MRL: m - dk gy, mod sft - firm, sbply - sbdkly, rthy - gt tex, mot, v calc 20% CHK: lt gy - mgy, sft - mod firm, sbply - sbdkly, sl wvy tex, occ mot, v calc, tr dism pyr, mod calcite, tr inoc	85% MRL: m - dk gy, mod sft - firm, sbply - sbdkly, rthy - gt tex, mot, v calc 15% CHK: lt gy - mgy, sft - mod firm, sbply - sbdkly, sl wvy tex, occ mot, v calc, tr dism pyr, mod calcite, tr inoc	85% MRL: m - dk gy, mod sft - firm, sbply - sbdkly, rthy - gt tex, mot, v calc 15% CHK: lt gy - mgy, sft - mod firm, sbply - sbdkly, sl wvy tex, occ mot, v calc, tr dism pyr, mod calcite, tr inoc	90% MRL: m - dk gy, mod sft - firm, sbply - sbdkly, rthy - gt tex, mot, v calc 10% CHK: lt gy - mgy, sft - mod firm, sbply - sbdkly, sl wvy tex, occ mot, v calc, tr dism pyr, mod calcite, tr inoc
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MD 9133'  
INC 89.23°  
AZI 86.98°  
TVD 6946.2'

137

121

MD 9223'  
INC 88.58°  
AZI 86.46°  
TVD 6947.9'

134

97

MR.L: m - dk gy, mod sft - firm, sbply - sbkly,  
itex, mot, v calc, mod calcite, tr inoc

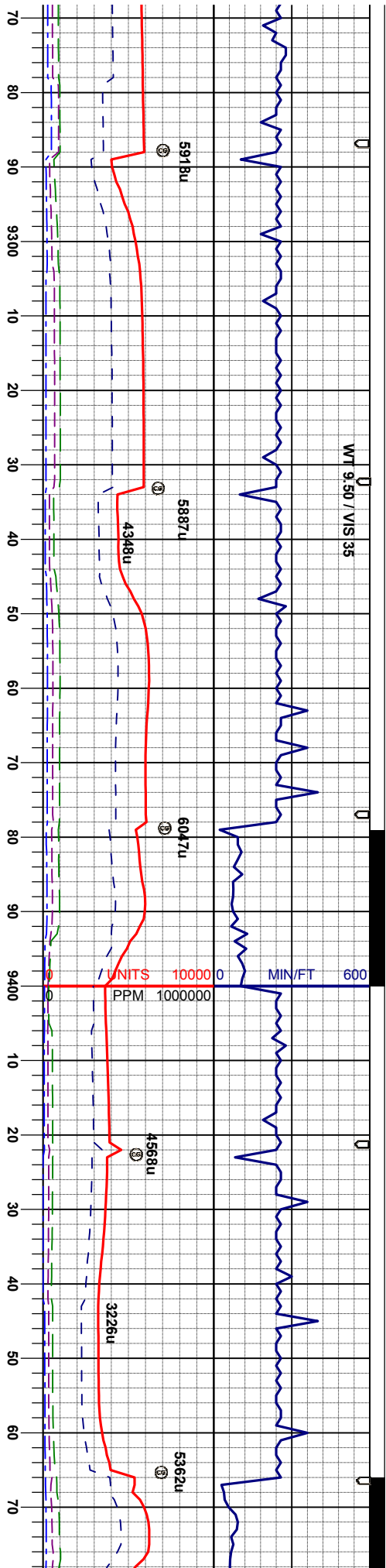
100% MR.L: m - dk gy, mod sft - firm, sbply - sbkly,  
rthy - gt tex, mot, v calc, tr disn pyr, mod calcite, tr  
inoc

100% MR.L: m - dk gy, mod sft - mod firm, sbply -  
sbkly, rthy - sly tex, sl mot, v calc, tr disn pyr, mod  
calcite, tr inoc

100% MR.L: m - dk gy, mod sft - mod firm, sbply -  
sbkly, rthy - sly tex, sl mot, v calc, tr disn pyr, mod  
calcite, tr inoc

95% MR.L: m - dk  
sbply, rthy - sly  
calcite, tr inoc  
5% CHK: il gy - m  
wvy tex, v calc





MD 9313'  
INC 88.21°  
AZI 85.29°  
TVD 6950.4'

123

103

MD 9402'  
INC 84.47°  
AZI 82.56°  
TVD 6956.1'

98

185

POSSIBLE FAULT

gy, mod sft - mod firm, sbbly -  
ex, sl mot, v calc, tr dism pyr, mod  
gy, sft - mod firm, sbbly - sbbly, sl

100% MRU: m - dk gy, mod sft - mod firm, sbbly -  
sbbly, rthy - shy tex, sl mot, v calc, tr dism pyr, mod  
calcite, tr inoc

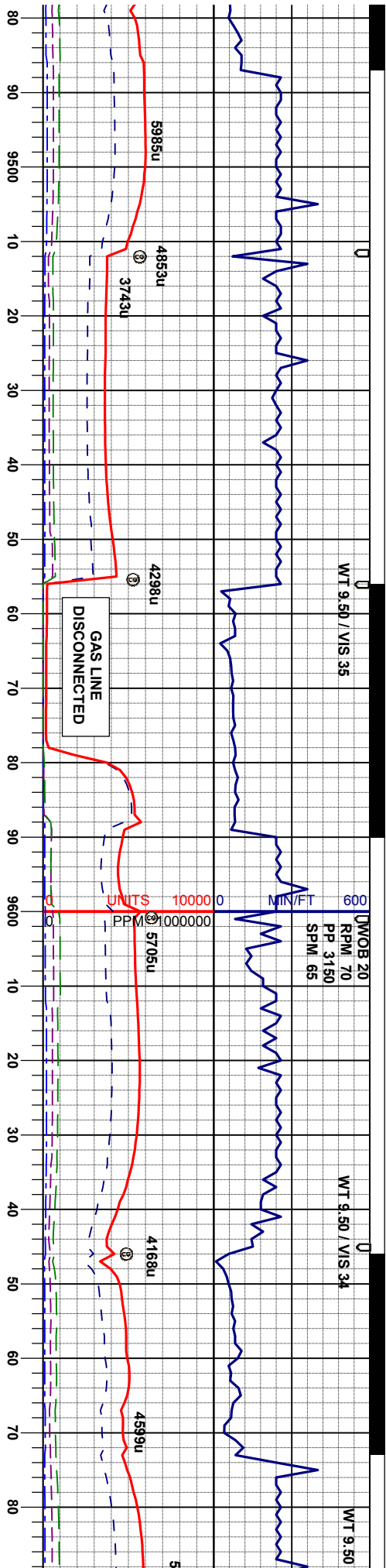
100% MRU: m - dk gy, mod sft - mod firm, sbbly -  
sbbly, rthy - shy tex, sl mot, v calc, tr dism pyr, mod  
calcite, tr inoc

100% MRU: m - dk gy, mod sft - mod firm, sbbly -  
sbbly, rthy - shy tex, sl mot, v calc, occ dism pyr, mod  
calcite, tr inoc

95% MRU: m - dk gy, mod sft -  
sbbly, rthy - shy tex, sl mot, v c  
5% CHK: lt gy - mgy, sft - mod  
wxy tex, v calc







MD 9492'  
INC 86.03°  
AZI 83.14°  
TVD 6964.3'

MD 9581'  
INC 86.67°  
AZI 84.15°  
TVD 6970.7'

MD 9671'  
INC 88.86°  
AZI 86.48°  
TVD 6974.3'

mod firm, sbply -  
calc, tr disn pyr, mod  
firm, sbply - sbply, sl

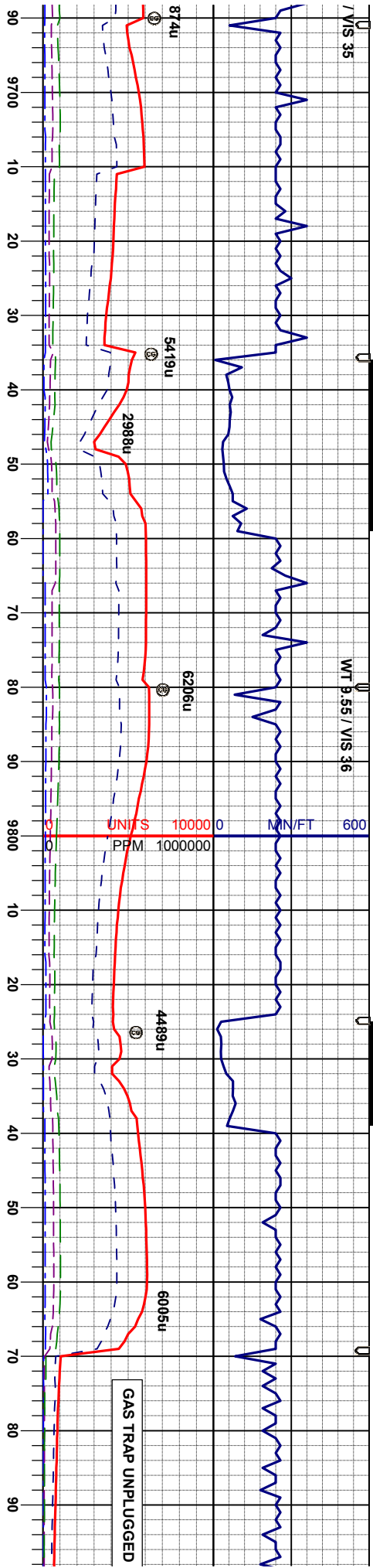
100% MRL: m - dk gy, mod st - mod firm, sbply -  
sbply, rthy - shly tex, sl mod, v calc, tr disn pyr, mod  
calcite, tr inoc

100% MRL: m - dk gy, mod st - mod firm, sbply -  
sbply, rthy - shly tex, sl mod, v calc, tr disn pyr, mod  
calcite, tr inoc

95% MRL: m - dk gy, mod st - mod firm, sbply -  
sbply, rthy - shly tex, sl mod, v calc, tr disn pyr, mod  
calcite, tr inoc  
5% CHK: lt gy - mgy, st - mod firm, sbply - sbply, sl  
wxy tex, v calc

95% MRL: m - dk gy, mod st - mod firm, sbp  
sbply, rthy - shly tex, sl mod, v calc, tr disn p  
calcite, tr inoc  
5% CHK: lt gy - mgy, st - mod firm, sbply - s  
wxy tex, v calc





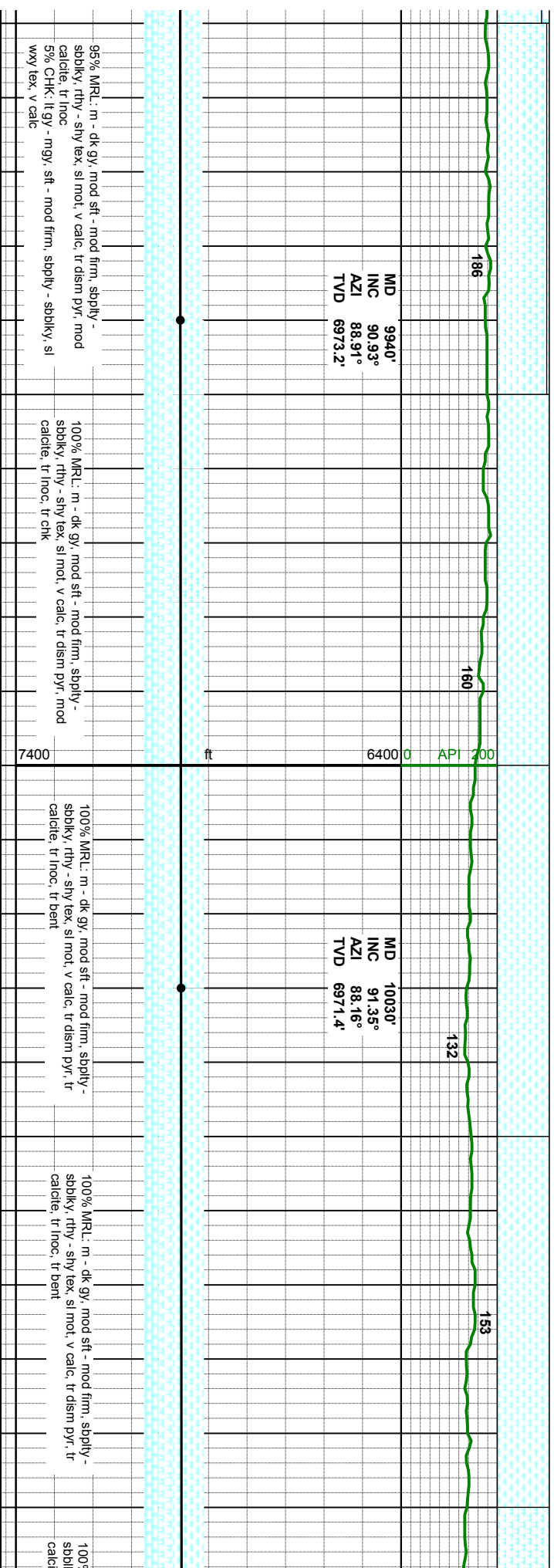
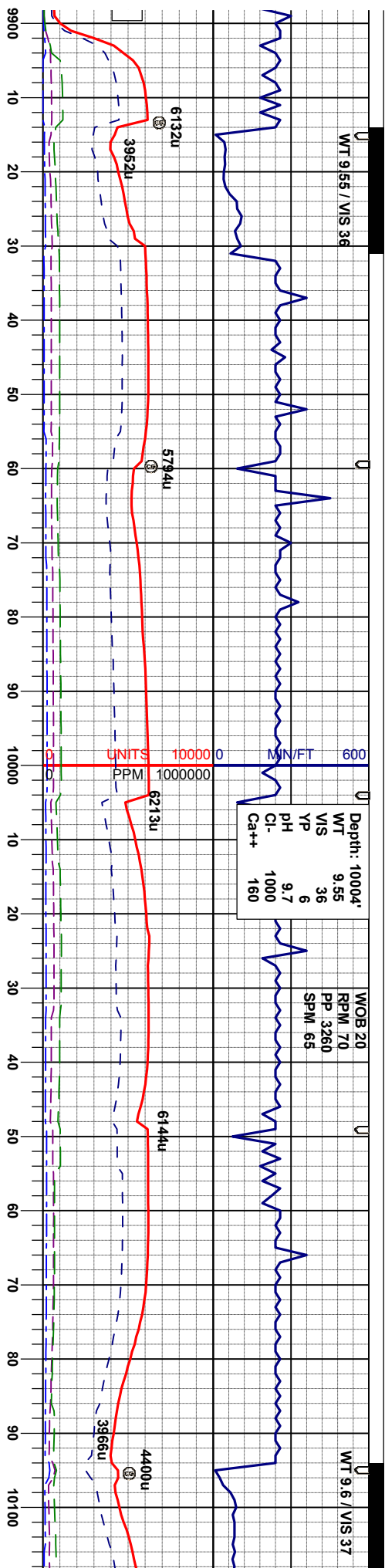
MD 9760'  
INC 90.59°  
AZI 86.34°  
TVD 6974.7'

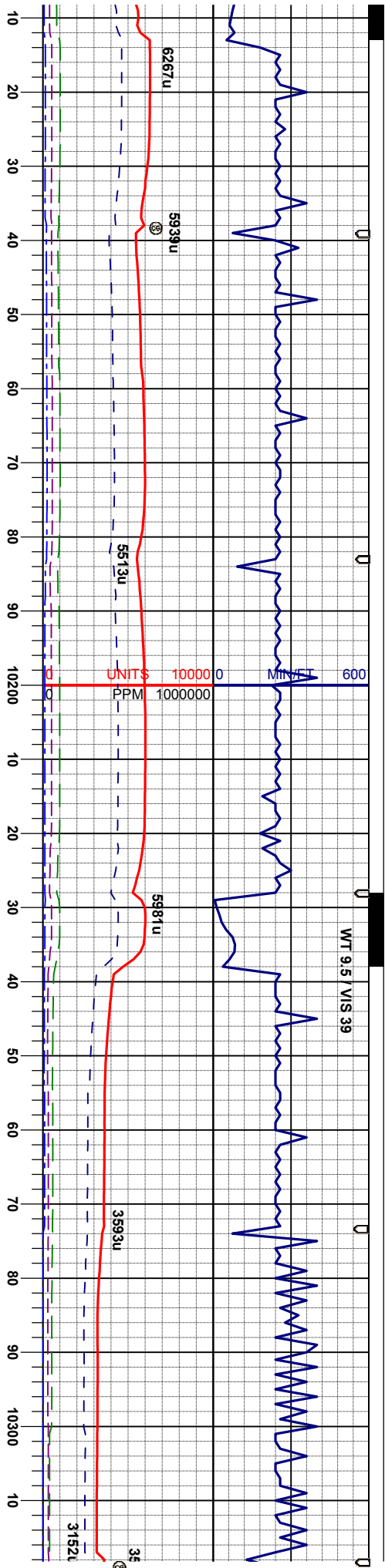
MD 9850'  
INC 90.22°  
AZI 87.77°  
TVD 6974.1'

90% MRL: m - dk gy, mod sft - mod firm, supply - sbblky, rthy - shy tex, sl mot, v calc, tr dism pyr, mod calcite, tr inoc	85% MRL: m - dk gy, mod sft - mod firm, supply - sbblky, rthy - shy tex, sl mot, v calc, tr dism pyr, mod calcite, tr inoc	85% MRL: m - dk gy, mod sft - mod firm, supply - sbblky, rthy - shy tex, sl mot, v calc, tr dism pyr, mod calcite, tr inoc	85% MRL: m - dk gy, mod sft - mod firm, supply - sbblky, rthy - shy tex, sl mot, v calc, tr dism pyr, mod calcite, tr inoc
10% CHK: lt gy - mgy, occ brn, sft - mod firm, supply - sbblky, sl wxy tex, v calc	15% CHK: lt gy - mgy, occ brn, sft - mod firm, supply - sbblky, sl wxy tex, v calc	15% CHK: lt gy - mgy, occ brn, sft - mod firm, supply - sbblky, sl wxy tex, v calc	15% CHK: lt gy - mgy, occ brn, sft - mod firm, supply - sbblky, sl wxy tex, v calc









MD 10119'  
INC 90.12°  
AZI 89.68°  
TVD 6970.3'

128

116

155

MD 10254'  
INC 91.51°  
AZI 90.06°  
TVD 6968.3'

MD 10299'  
INC 91.60°  
AZI 90.20°  
TVD 6967.1'

% MRL: m - dk gy, mod sft - mod firm, spbly -  
gy, rthy - sly tex, sl mod, v calc, tr dism pyr, tr  
te, vtr inoc, tr bent

100% MRL: m - dk gy, mod sft - mod firm, spbly -  
spbly, rthy - sly tex, sl mod, v calc, tr dism pyr, tr  
calcite, vtr inoc, tr bent

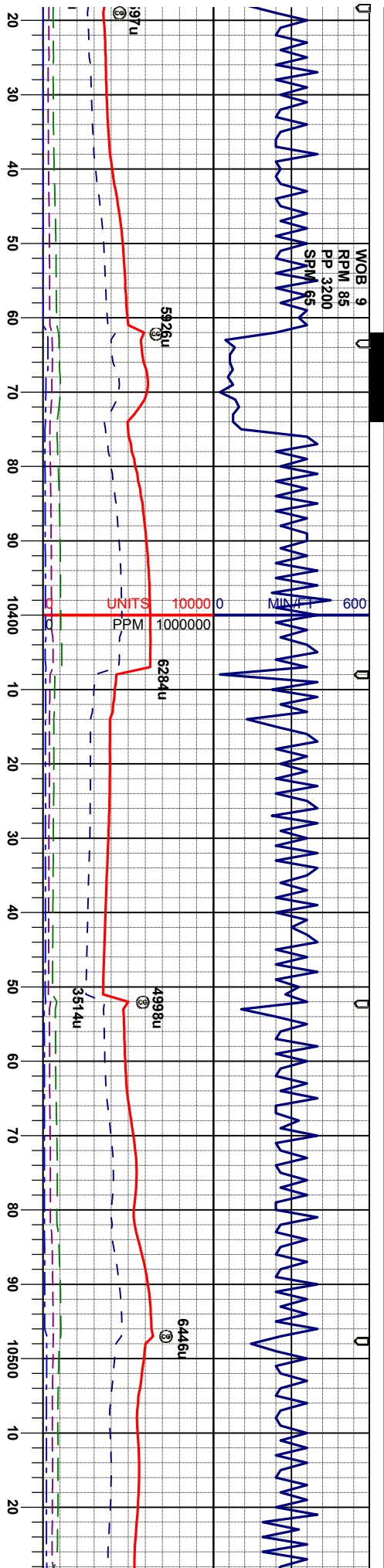
100% MRL: m - dk gy, mod sft - mod firm, spbly -  
spbly, rthy - sly tex, sl mod, v calc, tr dism pyr, tr  
calcite, vtr inoc, tr bent

100% MRL: m - dk gy, mod sft - mod firm, spbly -  
spbly, rthy - sly tex, sl mod, v calc, tr dism pyr, tr  
calcite, vtr inoc, tr bent

100% MRL: m - c  
spbly, rthy - sly  
calcite, vtr inoc, tr







MD 10388'  
INC 89.72°  
AZI 89.45°  
TVD 6966.1'

MD 10478'  
INC 91.26°  
AZI 91.52°  
TVD 6965.3'

dk gy, mod sft - mod firm, spbly -  
lex, sl mod, v calc, tr dism pyr, tr  
bent

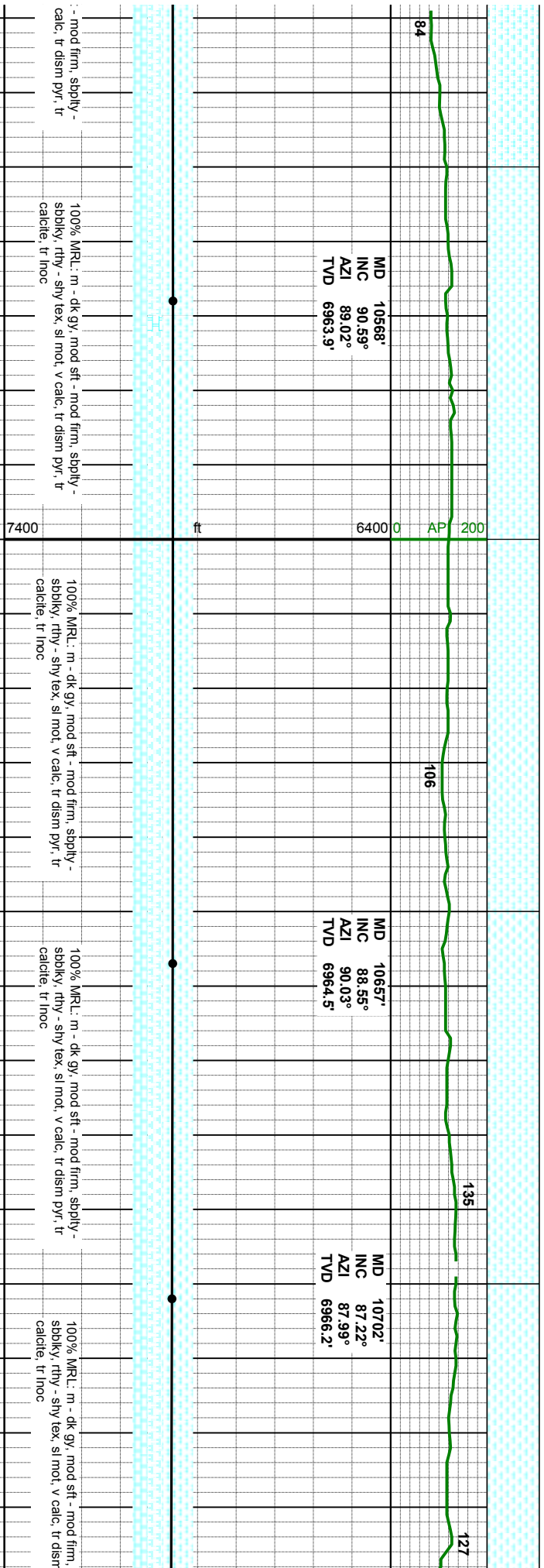
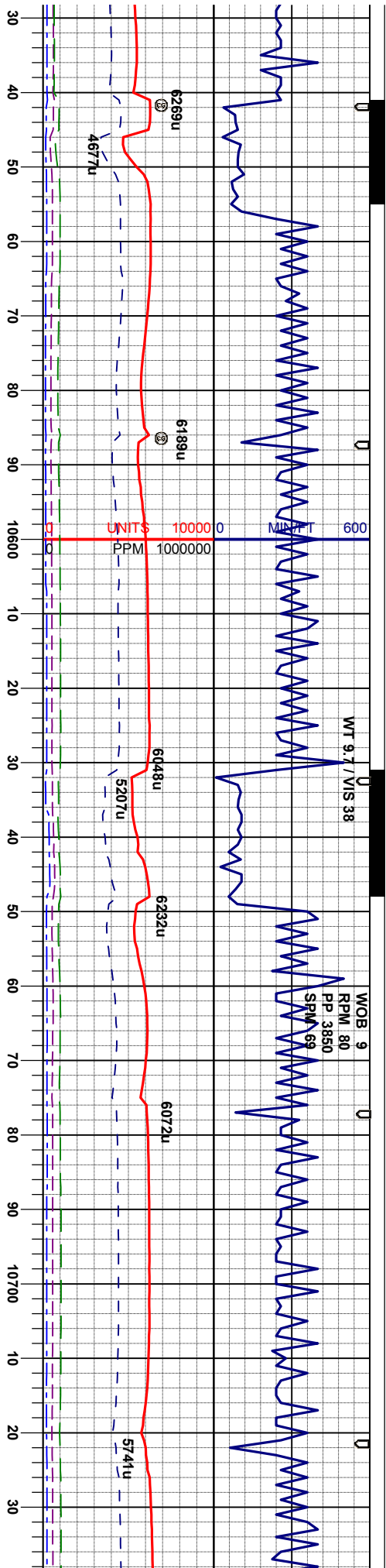
100% MRL: m - dk gy, mod sft - mod firm, spbly -  
sblbly, rthy - sly tex, sl mod, v calc, tr dism pyr, tr  
calcite, vtr inoc, tr bent

100% MRL: m - dk gy, mod sft - mod firm, spbly -  
sblbly, rthy - sly tex, sl mod, v calc, tr dism pyr, tr  
calcite, vtr inoc, tr bent

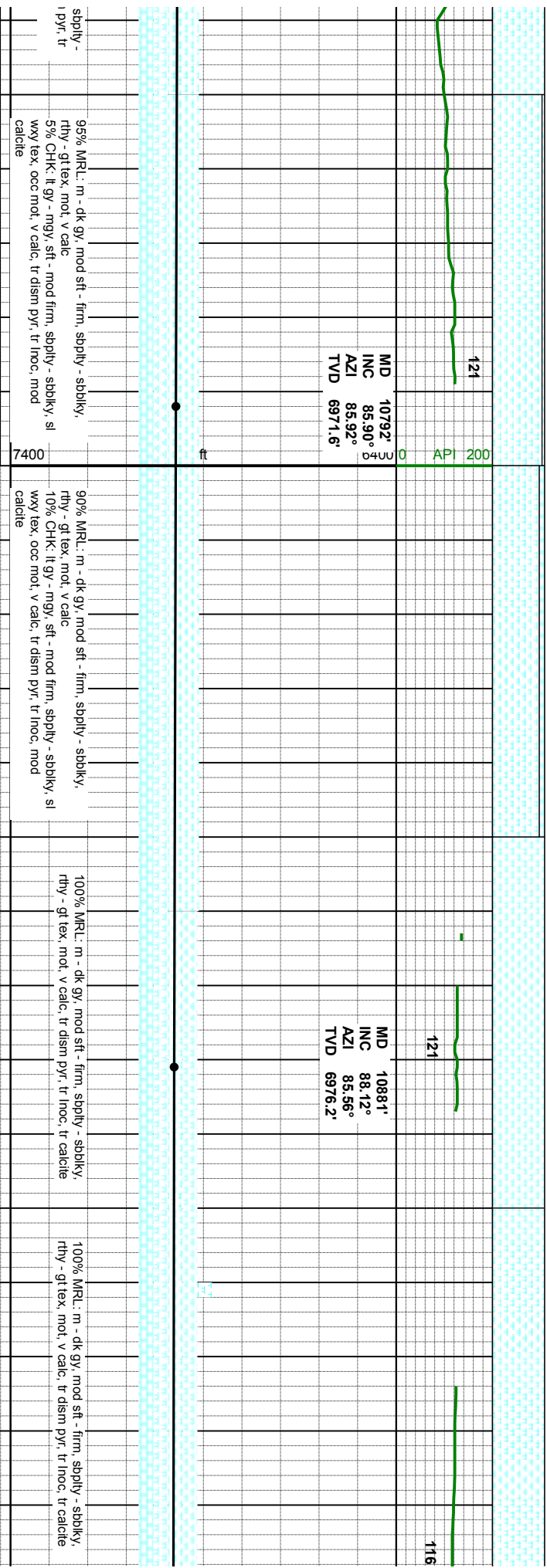
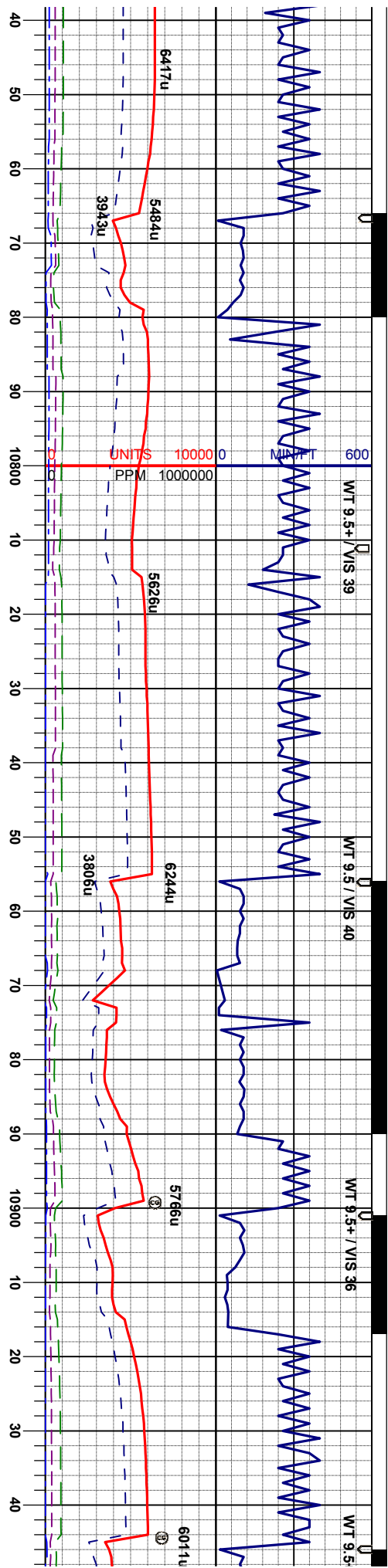
100% MRL: m - dk gy, mod sft - mod firm, spbly -  
sblbly, rthy - sly tex, sl mod, v calc, tr dism pyr, tr  
calcite, vtr inoc, tr bent

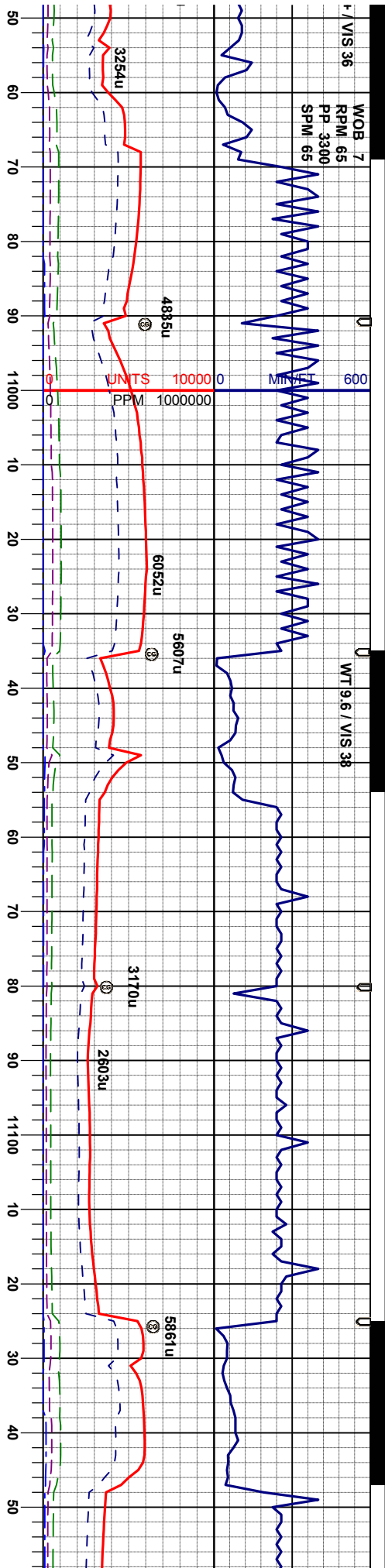
100% MRL: m - dk gy, mod sft -  
sblbly, rthy - sly tex, sl mod, v  
calcite, tr inoc











MD 10971'  
INC 88.98°  
AZI 87.76°  
TVD 6978.5'

GAMMA TOOL  
ERROR

MD 11061'  
INC 88.00°  
AZI 88.56°  
TVD 6980.8'

MD 1115'  
INC 88.9°  
AZI 91.2°  
TVD 6983'

100% MRL: m - dk gy, mod sft - firm, sbply - sbkly,  
rthy - gt tex, mod, v calc, tr dism pyr, tr inoc, tr calcite

100% MRL: m - dk gy, mod sft - firm, sbply - sbkly,  
rthy - gt tex, mod, v calc, tr dism pyr, tr inoc, tr calcite

100% MRL: m - dk gy, mod sft - firm, sbply - sbkly,  
rthy - gt tex, mod, v calc, tr dism pyr, tr inoc, tr calcite

100% MRL: m - dk gy, mod sft - firm, sbply - sbkly,  
rthy - gt tex, mod, v calc, tr dism pyr, tr inoc, tr calcite

100%  
rthy -





