



Scale: 5" / 100'  
Measured Depth Log

Well Name Wells Ranch State AA28-69HN(HORZ)

Location SEC 21-T6N-R63W

State COLORADO

Country USA

API Number 05-123-38140-00

Region DJ BASIN

Spud Date 12/29/2013

Surface Coordinates

LAT: 40.46737°N  
LONG: 104.43414°W  
913' FSL  
530' FEL

Bottom Hole Coordinates

LAT: 40.46483°N  
LONG: 104.44884°W  
1' FSL  
535' FWL

Ground Elevation 4731'

Logged Interval 6000' To 10958'

Formation NIOBRARA "B"

Type of Drilling Fluid WATER;MUD;POLY

County WELS

Rig Number H&P 322

AFE # 139118

Field WATTENBERG

Drilling Completed 1/4/2014

K.B. Elevation 4755'

Total Depth 10958'

Company Noble Energy Inc  
Address 1625 BROADWAY  
DENVER, CO 8  
(303) 228-4000

Name TERRY ACOMINI  
Company COLUMBINE LOGGING  
Address 2385 S. LIPAN  
DENVER, COLORADO  
(303) 289-7764



# Operator

MAY  
2022

3;MIKE GREENE

LOGGING, INC.

CRADO 80223

# Geologist

## Rock Types

Symbol	Rock Name	Symbol	Rock Name
	SHALY SILTSTONE		METAMORPHIC
	SILTY SHALE		NO SAMPLE
	SILTSTONE		SALT
	TILL		SANDSTONE
	TUFF		SALT-PEPPER SAND
	WEDDED TUFF		SHALE
			SHALE COLORED
			SHALE GRAY
			SHALY SANDSTONE
			MARLSTONE
			LIMESTONE
			SIDERITE or LIMONITE
			IGNEOUS
			GNEISS
			GRANITE
			GYPSUM
			DOLOMITE
			CONGLOMERATE
			SHAL

## Accessories

## Fossils

Fossils	F FOSSIL	-	ARGILLACEOUS	✓	GLAUCONITE	✓	TUFFACEOUS
	GASTROPOD	/	ARGILLITE GRAIN	✓	GYPSEIFEROUS		
	OOLITE	B	BENTONITE	✓	HEAVY MINERAL		
	OSTRACOD	✓	BITUMENOUS SUBSTANCE	✓	INOCERAMUS		
	BELEMNITE	✓	BRECCIA FRAGMENTS	K	KAOLIN		
	BIOCLASTIC	✓	CALCAREOUS	T	TRILITE		
	PELLET	✓	CARBONACEOUS FLAKES	✓	MINERAL CRYSTALS		
	PISOLITE	✓	CHERT	✓	NODULES		
	PLANT REMAINS	✓	CHERT	✓	PHOSPHATE PELLET		
	SCAPHOPOD	-	COAL - THIN BEDS	P	PYRITE		
	CRINOID	✓	DOLOMITIC	✓	SALT CAST		
	ECHINOID	+	FELDSPAR	✓	SILICEOUS		
	FISH	●	FERRUGINOUS PELLET				
	FORAMINIFERA	✓	ANHYDRITIC	✓	FERRUGINOUS	✓	SILTY

Stringer	✓	ANHYDRITE STRINGER		
	✓	BENTONITE STRINGER		
	✓	COAL STRINGER		
	✓	DOLOMITE STRINGER		
	✓	GYP SUM STRINGER		
	✓	LIMESTONE STRINGER		
	✓	MARLSTONE (CALC) STRG		
	✓	MARLSTONE (DOL) STRG		
	✓	SANDSTONE STRINGER		
	✓	SHALE STRINGER		

✓	SILTSTONE STRINGER		
---	--------------------	--	--

## Other Symbols

# Oil Show

Oil Show

☒ MOLDIC  
☒ ORGANIC  
☒ PINPOINT  
☒ VUGGY  
☒ DEAD  
☒ EVEN

☒ FAULT  
☒ FORMATION TOP  
☒ GAS SHOW  
☒ MN DEPTH  
☒ MN DEPTH









☒ WIRELINE TESTED - LEFT  
☒ WIRELINE TESTED - RT  
☒ E EARTHY  
☒ Fx FINELYXXLN  
☒ GS GRAINSTONE  
☒ L LITHOGRAPHIC

Rounding




# Engineering

- QUESTIONABLE
- SPOTTED STAINING
- NORMAL FAULT
- OIL SHOW
- ANGULAR
- ROUNDED
- MICROXYLON
- MUDSTONE
- PACKSTONE
- WACKESTONE
- OVERTURNED STRATA
- SUBANG
- REVERSE FAULT
- SUBURD
- BIT
- CONNECTION (LEFT)
- POROSITY


## Porosity

-  E EARTHY
-  F FENESTRAL
-  F FRACTURE
-  X INTERCRYSTALLINE
-  Q INTEROOLITIC
-  ➡ CONNECTION (RIGHT)
-  ⬇ CORE - LOST
-  ■ CORE - RECOVERED
-  ⋮ DST INTERVAL
-  ⬅ SIDEWALL CORE (LEFT)
-  ➡ SIDEWALL CORE (RIGHT)
-  📄 SLIDE
-  📊 SURVEY
-  🚗 TRIP GAS

## Textures

-  BS BOUNDSTONE
-  ☉ CHALKY
-  ☒ CRYPTOXLN

## Sorting

-  M MODERATE
-  P POOR
-  W WELL

## Textures

**BS** BOUNDSTONE      **M** MODERATE  
**C** CHALKY      **P** POOR  
**OX** CRYPTOXIN      **W** WELL

## Sorting

**M** MODERATE  
**P** POOR  
**W** WELL

Began Build @ 6000' MD  
@ 1319 hrs, 01/01/2014

ROP  
ROF  
Gamma

89

MUD WT 9.3+ VIS 34

Total Gas & Chromatograph

GAS  
C1  
C2  
C3  
C4

Begin 50' Sample Intervals

1120u

C1: 83.0%  
C2: 7.0%  
C3: 10.0%  
C4: 0.0%

COLUMBINE LOGGING INC.  
RIGGED UP ON 12/30/2013  
MANNED 2-PERSON LOGGING  
WITH BLOODHOUND GAS  
CHROMATOGRAPH UNIT #0315

Depth Labels

5.960 5.970 5.980 5.990 6.000 6.010 6.020 6.030 6.040 6.050 6.060 6.070 6.080 6.090 6.100 6.110 6.120 6.130

% Lith

5860

BHA #2  
Size: 8.75"  
Manufacturer: HDBS  
Model: NA  
Serial #: 12194003  
Nozzles: 5x16  
Motor: NA  
Manufacturer: Sperry Drilling  
Model: Sperry Drill  
Serial #675-0154  
Bend: 2.0

Well Bore  
TVD

MD: 6.014  
TVD: 5.917.27  
Inclination: 0.25 °  
Azimuth: 141.15 °  
VS: -259.34 '  
TVD (ft) VS: -259.32 '

MD: 6.076  
TVD: 5.979.26  
Inclination: 1.82 °  
Azimuth: 273.83 °  
VS: -258.51 '

MD: 6.123  
TVD: 6.026.1  
Inclination: 7.25 °  
Azimuth: 279.35 °  
VS: -255.06 '

95% SLTY SH: m-dk gy occ gy brn, ply - sb  
ply firm-si sft, rthy-si silty  
5% SHY SS: wh - lt gy, f gr, sb rd- sb ang, fr  
srt, fri, mod por

90% SLTY SH: m-dk gy occ gy brn, ply - sb  
ply firm-si sft, rthy-si silty  
10% SHY SS: wh - lt gy, f gr, sb rd- sb ang, fr  
srt, fri, mod por

100% SLTY SH: m-dk gy occ gy b  
sb ply firm-si sft, rthy-si silty

Oil Show

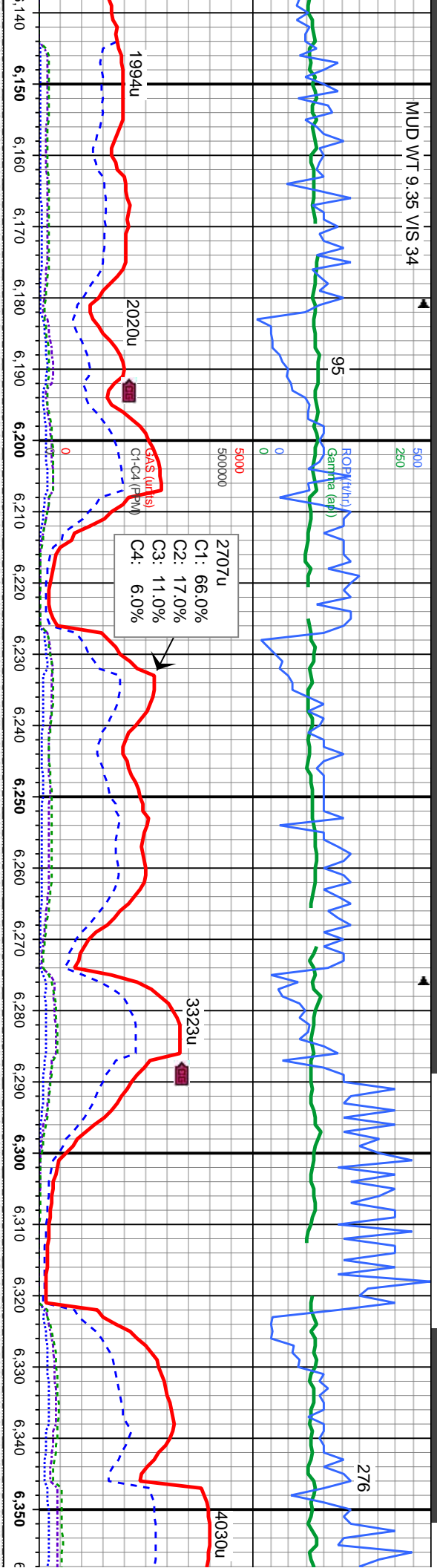
TR  
FM  
GE

Images





MUD WT 9.35 VIS 34



MD: 6,170  
TVD: 6,072.43  
Inclination: 11.94 °  
Azimuth: 279.51 °  
VS: -247.84 '

MD: 6,218  
TVD: 6,118.92  
Inclination: 16.71 °  
Azimuth: 275.52 °  
VS: -236.73 '

MD: 6,265  
TVD: 6,163.53  
Inclination: 19.98 °  
Azimuth: 271.91 °  
VS: -222.59 '

MD: 6,313  
TVD: 6,208.42  
Inclination: 21.5 °  
Azimuth: 270.07 °  
VS: 393.63 '

95% SLTY SH: m-dk gy occ gy brn, pily - sb  
pily firm-slt, rthy-slt sily  
5% SHY SS: wh - lt gy, f gr, sb rd- sb ang, fr  
srt, fri, mod por

90% SLTY SH: m-dk gy occ dk gy brn, sb  
biky - sb pily firm-slt sily, rthy-slt sily  
10% SHY SS: wh - lt gy, vf gr, sb mnd- sb ang,  
fr srt, fri, mod por

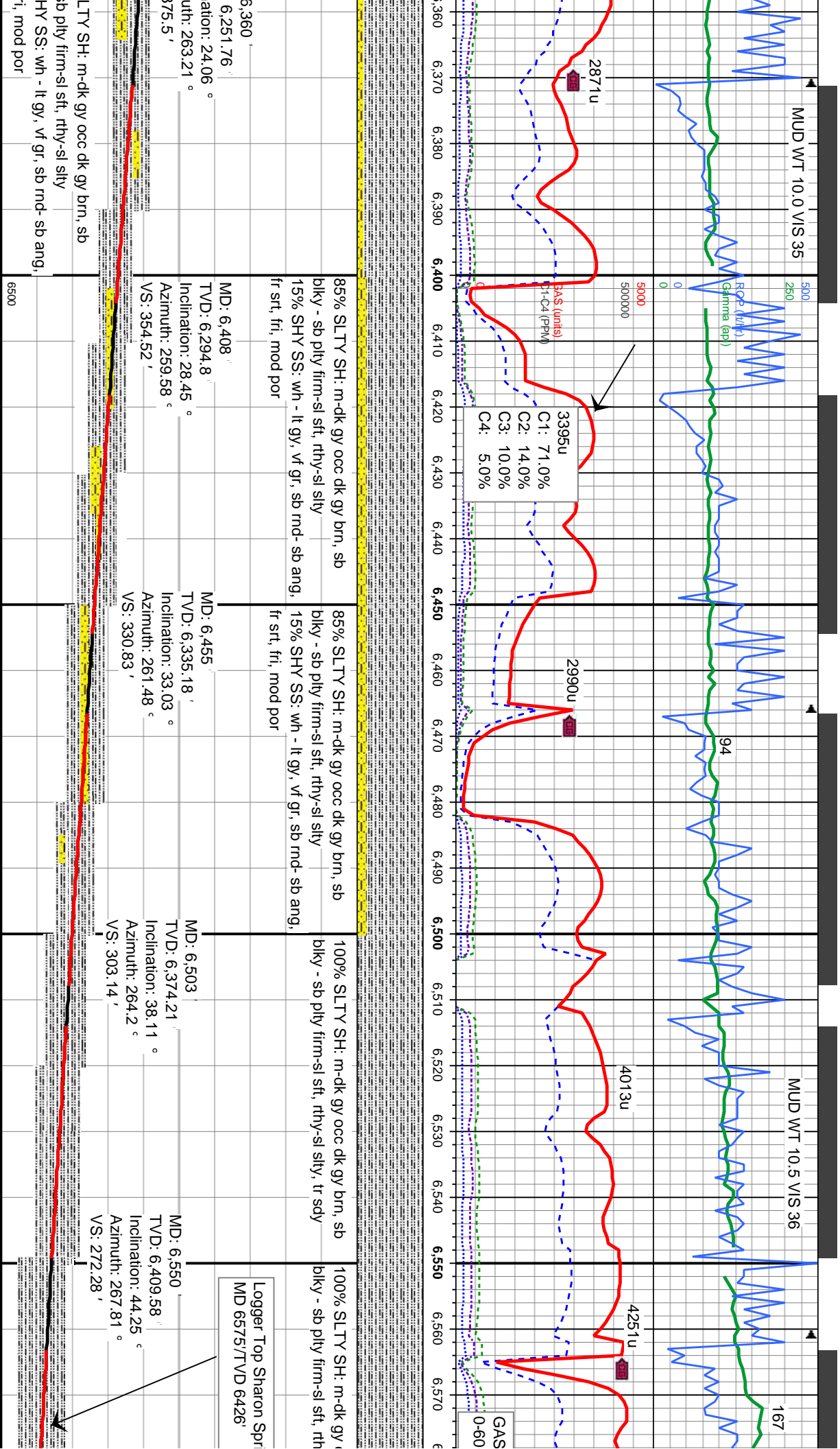
90% SLTY SH: m-dk gy occ dk gy brn, sb  
biky - sb pily firm-slt sily, rthy-slt sily  
10% SHY SS: wh - lt gy, vf gr, sb mnd- sb ang,  
fr srt, fri, mod por

95% SLTY SH: m-dk gy occ dk gy brn, sb  
biky - sb pily firm-slt sily, rthy-slt sily  
5% SHY SS: wh - lt gy, vf gr, sb mnd- sb ang,  
fr srt, fri, mod por

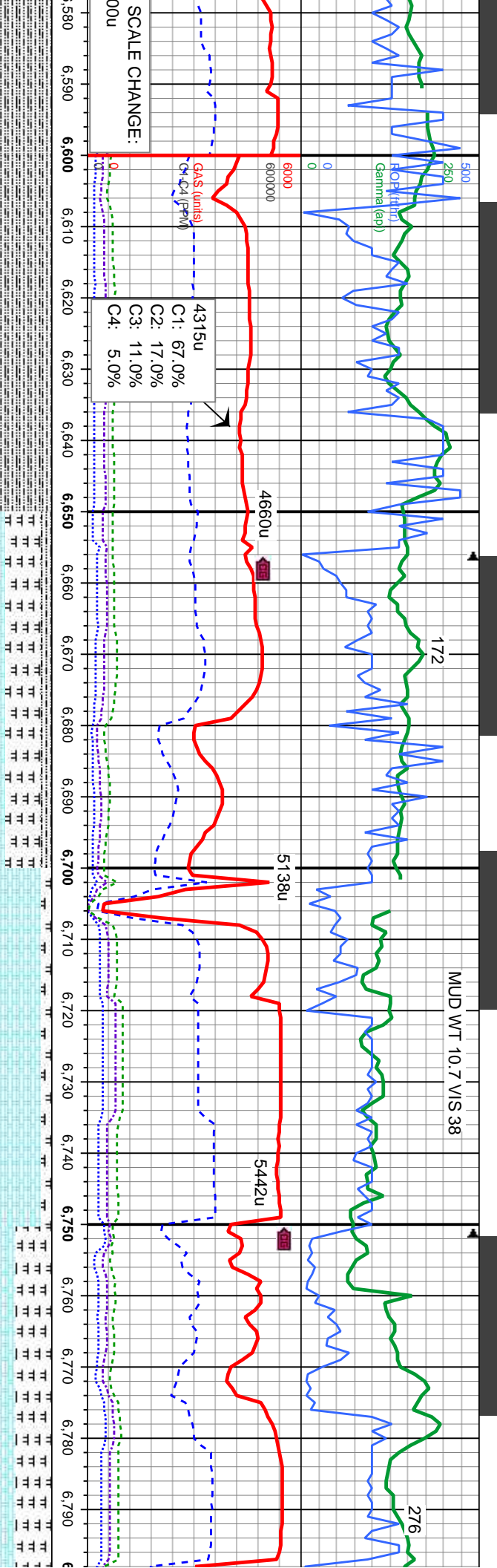
90% S  
biky - s  
10% S  
fr srt, fi











occ dk gy brn, sb y-sl silty, tr sdy	6400	Logger Top Niobrara MD 6718 / TVD 6511'	Logger Top Nio A Chalk MD 6724 / TVD 6514'	Logger Top Nio A Marl MD 6771 / TVD 6536'
ings	6400			
MD: 6,598 TVD: 6,442.39' Inclination: 49.45° Azimuth: 269.85° VS: -50.7'	TVS SCALE CHANGE: 6400-6800	MD: 6,645 TVD: 6,471.49' Inclination: 54.02° Azimuth: 269.84° VS: -14.79'	MD: 6,693 TVD: 6,498.18' Inclination: 58.41° Azimuth: 268.45° VS: 24.14'	MD: 6,740 TVD: 6,522.02' Inclination: 60.64° Azimuth: 268.23° VS: 63.79'
95% SLTY SH: m-dk gy occ dk gy brn, sb biky - sb pily firm-sil sft, rthy-sil silty 5% SHY SS: wh - lt gy, vf gr, sb md-sb ang, fr srt, fri, mod por		50% MRL: med-dk gy, mod sft-sil frm, sb biky, rthy-silty tex, sil mot, occ vit lst, v calc 35% CHK: wh-lt gy, gy brn, sft, occ mod frm, sb biky-sb pily, rthy-sb wxy, v calc 15% SLTY SH: m-dk gy occ dk gy brn, sb biky - sb pily firm-sil sft, rthy-sil silty	85% CHK: wh-lt gy, gy brn, sft, occ mod frm, sb biky-sb pily, rthy-sb wxy, v calc 15% MRL: med-dk gy, mod sft-sil frm, sb biky-sb pily, rthy tex, sil mot, occ vit lst, v calc	50% MRL: med-dk gy, mod sft-sil frm, sb biky-sb pily, rthy tex, sil mot, occ vit lst, v cal 50% CHK: wh-lt gy, gy brn, sft, occ mod frm, sb biky-sb pily, rthy-sb wxy, v calc





DATE TIME

1/02/14

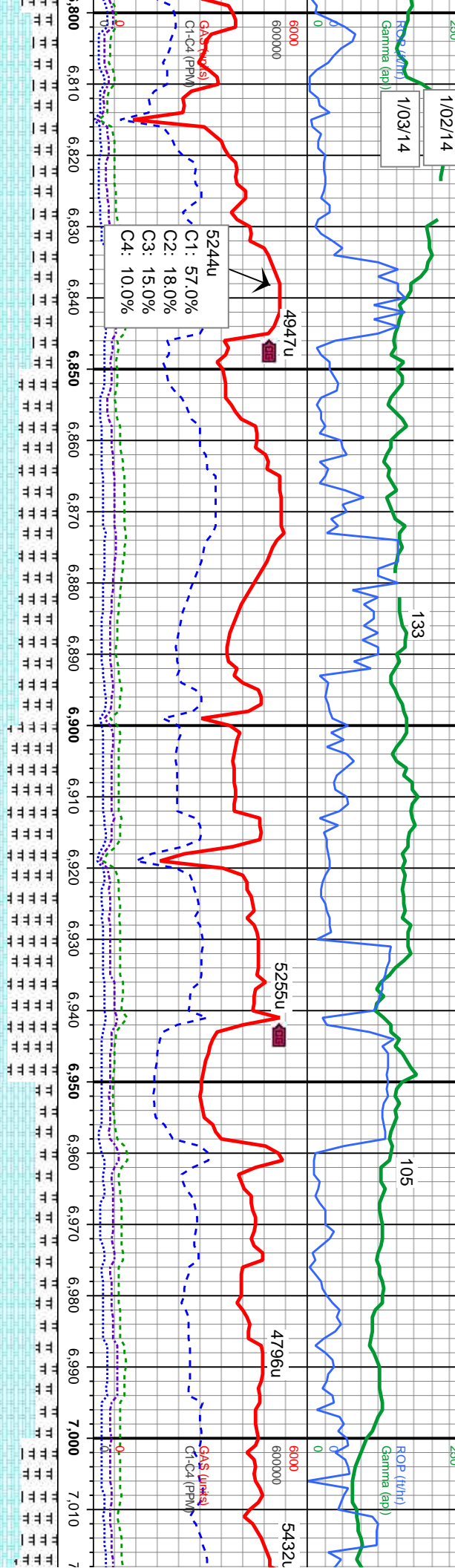
1/03/14

ROD (ft)

Gamma (cp)

MUD WT 10.8 VIS 37

MUD WT 9.5+ VIS 35



MD: 6,835'  
TVD: 6,563.34'  
Inclination: 68.59°  
Azimuth: 266.67°  
VS: 147.75'

MD: 6,883'  
TVD: 6,579.06'  
Inclination: 73.19°  
Azimuth: 266.87°  
VS: 192.37'

Logger Top Nio B Chalk  
MD 6952/TVD 6595'

MD: 6,959'  
TVD: 6,597.23'  
Inclination: 79.13°  
Azimuth: 266.88°  
VS: 264.94'

65% CHK: wh-it gy, gy brn, sft, occ mod frm,  
sb blk-y-sb pty, rthy-sb wxy, v calc  
35% MRL: med-dk gy, mod sft-sl frm, sb  
blk-y-sb pty, rthy tex, sl mot, occ vit lstr, v calc

55% MRL: med-dk gy, mod sft-sl frm, sb  
blk-y-sb pty, rthy tex, sl mot, occ vit lstr, v calc  
45% CHK: wh-it gy, gy brn, sft, occ mod frm,  
sb blk-y-sb pty, rthy-sb wxy, v calc

70% MRL: med-dk gy, mod sft-sl frm, sb  
blk-y-sb pty, rthy tex, sl mot, occ vit lstr, v calc  
30% CHK: wh-it gy, gy brn, sft, occ mod frm,  
sb blk-y-sb pty, rthy-sb wxy, v calc

70% CHK: wh-it gy, gy brn, sft, occ mod frm,  
sb blk-y-sb pty, rthy-sb wxy, v calc  
30% MRL: med-dk gy, mod sft-sl frm, sb  
blk-y-sb pty, rthy tex, sl mot, occ vit lstr, v calc

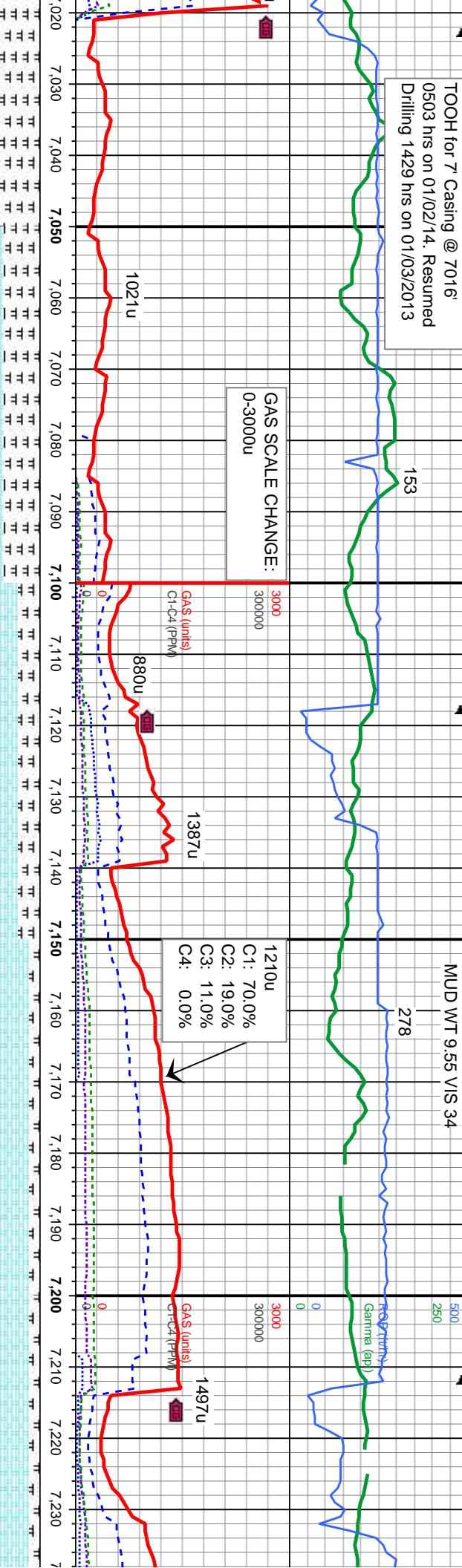
55% CHK: wh-it  
sft, frm ip, sb blk  
calc  
45% MRL: med-dk  
blk-y-sb pty, mot  
lstr, v calc, rr pyr





TOOH for 7" Casing @ 7016'  
0503 hrs on 01/02/14. Resumed  
Drilling 1429 hrs on 01/03/2013

MUD WT 9.55 VIS 34



BHA # 3  
Bit Size: 6.125  
Manufacturer: HDBS  
Model: MMD54  
Serial Number: 12321580  
Nozzles: 5x11

Motor Number: 3  
Manufacturer: Sperry Drilling  
Model: Sperry Drill  
Serial Number: 475-574  
Bend: 1.5

MD: 7,145'  
TVD: 6,617.71'  
Inclination: 86.06 °  
Azimuth: 265.93 °  
VS: 447.03'

MD: 7,145'  
TVD: 6,617.71'  
Inclination: 86.06 °  
Azimuth: 265.93 °  
VS: 447.03'

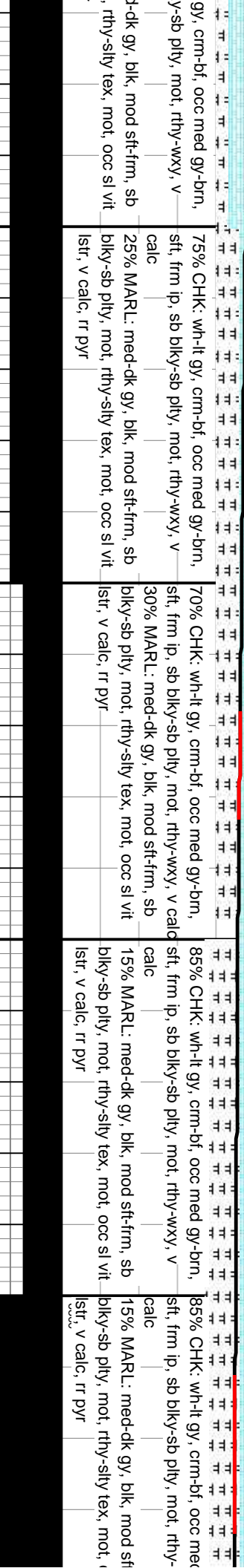
gy, crm-bf, occ med gy-brn,  
y-sb pty, mot, rthy-wxy, v

75% CHK: wh-it gy, crm-bf, occ med gy-brn,  
sft, frm ip, sb blk-y-sb pty, mot, rthy-wxy, v  
calc  
25% MARL: med-dk gy, blk, mod sft-frm, sb  
blk-y-sb pty, mot, rthy-sily tex, mot, occ sl vit  
lstr, v calc, rr pyr

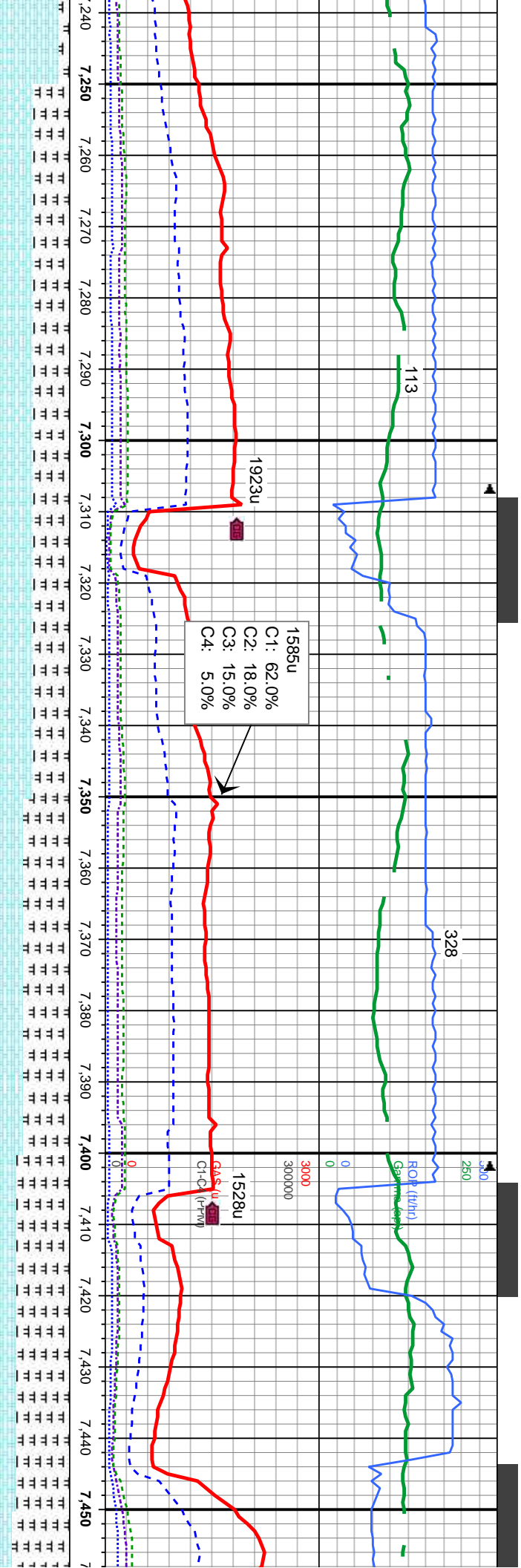
70% CHK: wh-it gy, crm-bf, occ med gy-brn,  
sft, frm ip, sb blk-y-sb pty, mot, rthy-wxy, v  
calc  
30% MARL: med-dk gy, blk, mod sft-frm, sb  
blk-y-sb pty, mot, rthy-sily tex, mot, occ sl vit  
lstr, v calc, rr pyr

85% CHK: wh-it gy, crm-bf, occ med gy-brn,  
sft, frm ip, sb blk-y-sb pty, mot, rthy-wxy, v  
calc  
15% MARL: med-dk gy, blk, mod sft-frm, sb  
blk-y-sb pty, mot, rthy-sily tex, mot, occ sl vit  
lstr, v calc, rr pyr

85% CHK: wh-it gy, crm-bf, occ med gy-brn,  
sft, frm ip, sb blk-y-sb pty, mot, rthy-wxy, v  
calc  
15% MARL: med-dk gy, blk, mod sft-frm, sb  
blk-y-sb pty, mot, rthy-sily tex, mot, occ sl vit  
lstr, v calc, rr pyr







MD: 7.335  
TVD: 6,625.17'  
Inclination: 88.09 °  
Azimuth: 265.54 °  
VS: 634.61'

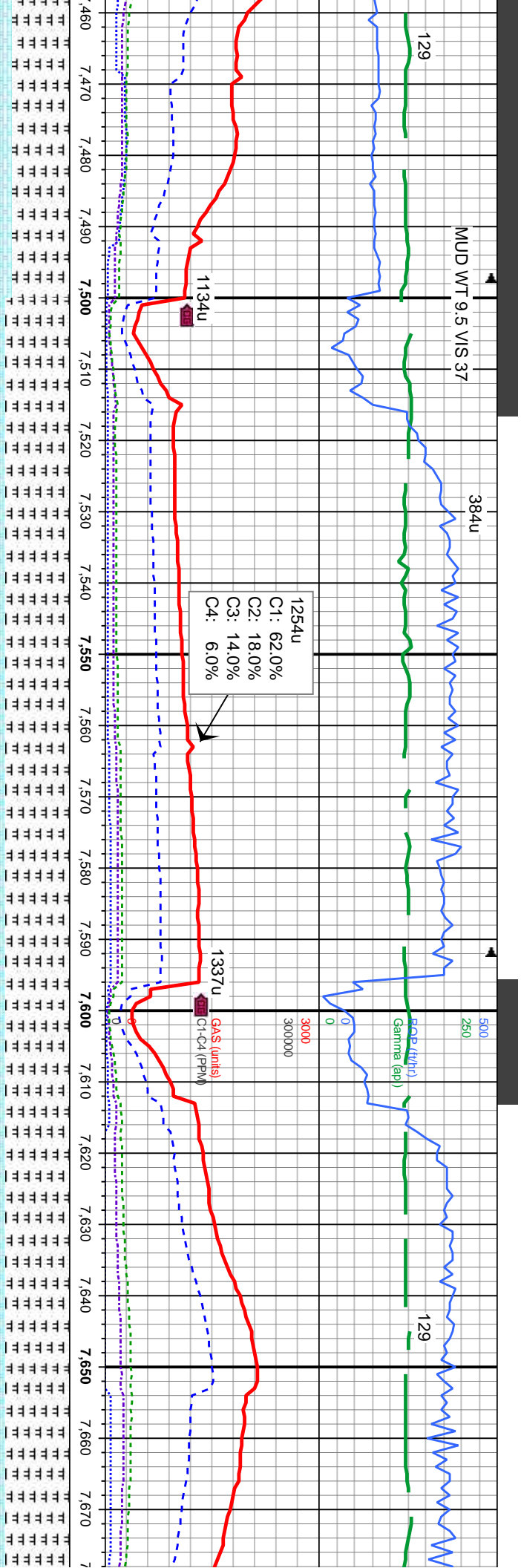
TVD Scale Change:  
6500-6850

MD: 7.430  
TVD: 6,627.11'  
Inclination: 89.57 °  
Azimuth: 266.48 °  
VS: 728.3'

50% CHK: wh-ll gy, cm-bf, occ med gy-bm, sft, frm ip, sb blk-y-sb pily, mot, rthy-wxy, v cald	85% CHK: wh-ll gy, cm-bf, occ med gy-bm, sft, frm ip, sb blk-y-sb pily, mot, rthy-wxy, v cald	65% MRL: dkgy, mod sft-sl frm, sb blk-y-sb pily, rthy tex, tr mot, occ calc frags, v calc	75% MRL: dkgy, mod sft-sl frm, sb blk-y-sb pily, rthy tex, tr mot, occ calc frags, v calc	80% M
50% MARL: med-dk gy, blk, mod sft-frm, sb blk-y-sb pily, mot, rthy-sily tex, mot, occ sl vit	15% MARL: med-dk gy, blk, mod sft-frm, sb blk-y-sb pily, mot, rthy-sily tex, mot, occ sl vit	35% CHK: lt gy, gy brn, sft, occ mod frm, sb blk-y-sb pily, rthy-sb wxy, v calc	25% CHK: lt gy, gy brn, sft, occ mod frm, sb blk-y-sb pily, rthy-sb wxy, v calc	20% C
lstr, v calc, rr pyr	lstr, v calc, rr pyr	blk-y-sb pily, rthy-sb wxy, v calc	blk-y-sb pily, rthy-sb wxy, v calc	blk-y-sb







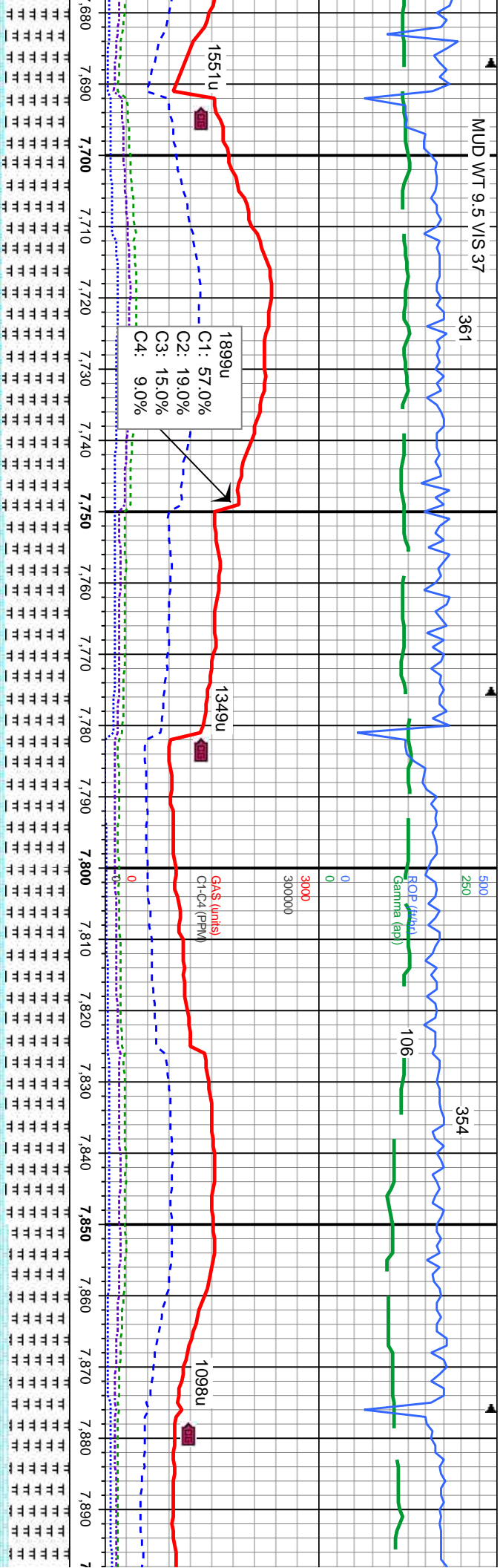
MD: 7,525'  
TVD: 6,627.52'  
Inclination: 89.94°  
Azimuth: 266.49°  
VS: 821.88'

MD: 7,620'  
TVD: 6,627.83'  
Inclination: 89.69°  
Azimuth: 268.06°  
VS: 915.22'

RL: dkgy, mod sft-sl frm, sb blk-y-sb v tex, tr mot, occ calc frags, v calc CHK: lt gy, gy brn, sft, occ mod frm, sb ply, rthy-sb wxy, v calc	90% MRL: dkgy, mod sft-sl frm, sb blk-y-sb ply, rthy tex, tr mot, occ calc frags, v calc 10% CHK: lt gy, gy brn, sft, occ mod frm, sb blk-y-sb ply, rthy-sb wxy, v calc	90% MRL: dkgy, mod sft-sl frm, sb blk-y-sb ply, rthy tex, tr mot, occ calc frags, v calc 10% CHK: lt gy, gy brn, sft, occ mod frm, sb blk-y-sb ply, rthy-sb wxy, v calc	90% MRL: dkgy, mod sft-sl frm, sb blk-y-sb ply, rthy tex, tr mot, occ calc frags, v calc 10% CHK: lt gy, gy brn, sft, occ mod frm, sb blk-y-sb ply, rthy-sb wxy, v calc
--	--	--	--







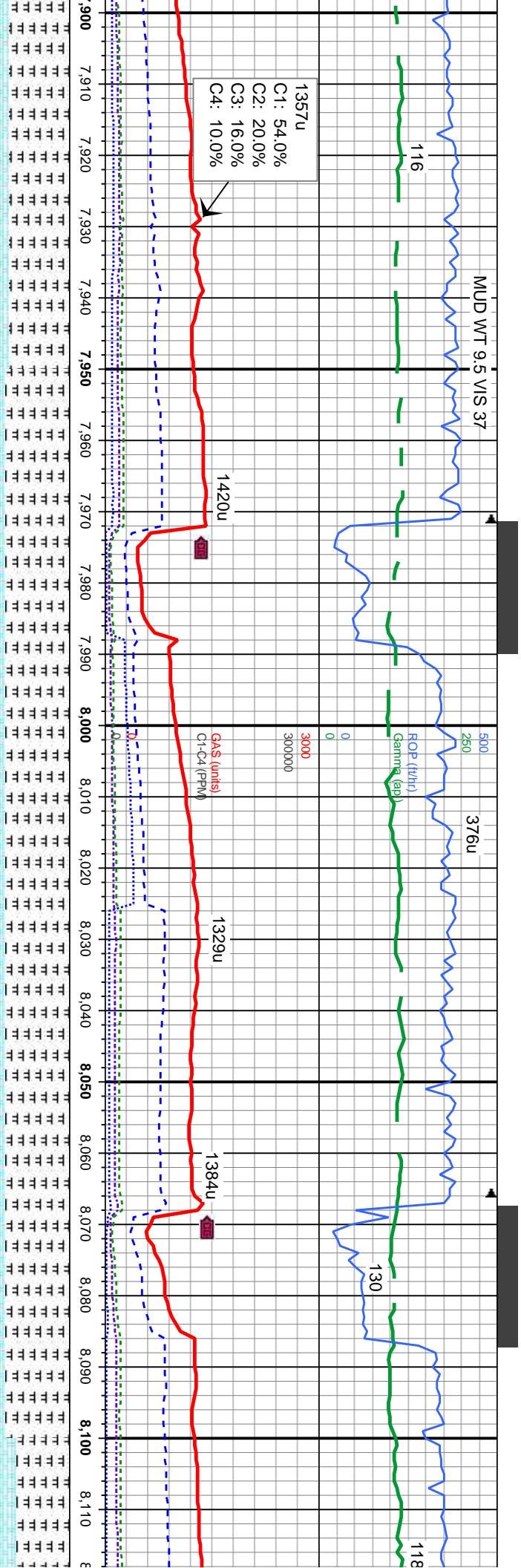
MD: 7,715'  
TVD: 6,627.85'  
Inclination: 90.28°  
Azimuth: 268.59°  
VS: 1,008.23'

MD: 7,809'  
TVD: 6,627.52'  
Inclination: 90.12°  
Azimuth: 267.66°  
VS: 1,100.32'

sb frm, sb blkly-sb calc frags, v calc lt, occ mod frm, sb v calc	95% MRL: dkgy, mod sft-sl frm, sb blkly-sb plty, rthy tex, tr mot, occ calc frags, v calc 5% CHK: lt gy, gy brn, sft, occ mod frm, sb blkly-sb plty, rthy-sb wxy, v calc	90% MRL: dkgy, mod sft-sl frm, sb blkly-sb plty, rthy tex, tr mot, occ calc frags, v calc 10% CHK: lt gy, gy brn, sft, occ mod frm, sb blkly-sb plty, rthy-sb wxy, v calc	90% MRL: dkgy, mod sft-sl frm, sb blkly-sb plty, rthy tex, tr mot, occ calc frags, v calc 10% CHK: lt gy, gy brn, sft, occ mod frm, sb blkly-sb plty, rthy-sb wxy, v calc	85% MRL: dkgy, mod sft-sl frm, sb blkly-sb plty, rthy tex, tr mot, occ calc frags, v calc 15% CHK: lt gy, gy brn, sft, occ mod frm, sb blkly-sb plty, rthy-sb wxy, v calc
--	---	--	--	--







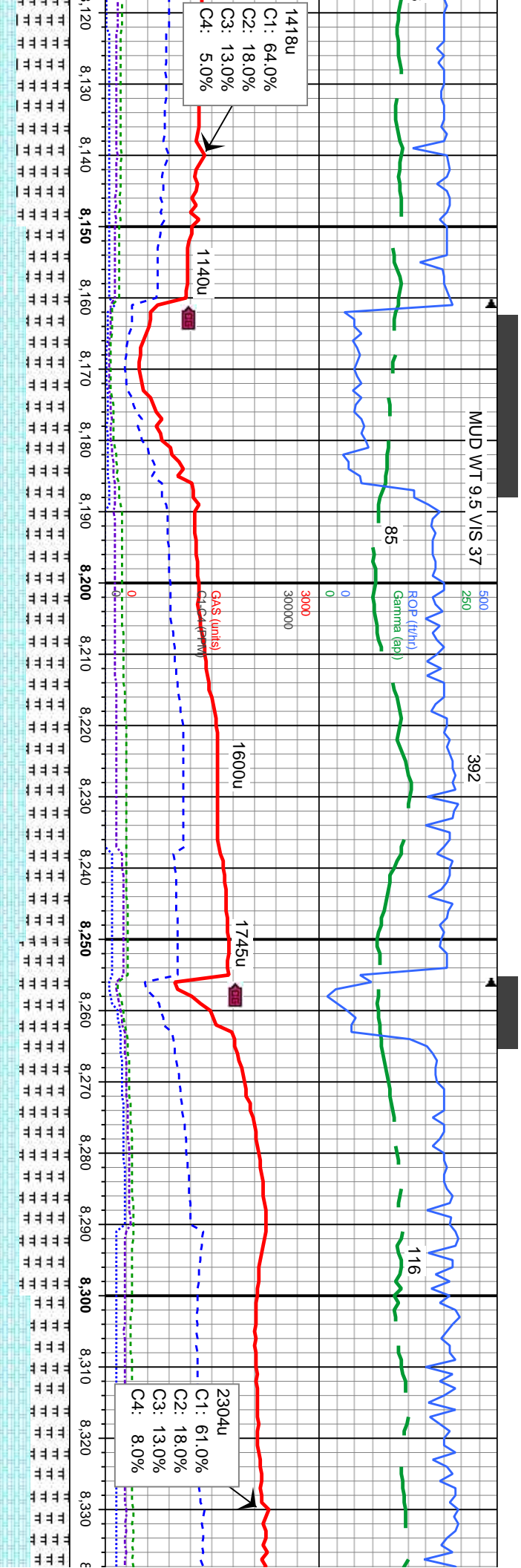
7,904' MD: 7,999' 6500  
TVD: 6,630.97'  
Inclination: 88.67°  
Azimuth: 265.41°  
VS: 1,287.41'

7,904' MD: 8,094'  
TVD: 6,633.12'  
Inclination: 88.73°  
Azimuth: 266.03°  
VS: 1,381.18'

85% MRL: dkgy, mod sft-sl frm, sb blk-y-sb pty, rthy tex, tr mot, occ calc frags, v calc 15% CHK: lt gy, gy brn, sft, occ mod frm, sb blk-y-sb pty, rthy-sb wxy, v calc	90% MRL: dkgy, mod sft-sl frm, sb blk-y-sb pty, rthy tex, tr mot, occ calc frags, v calc 10% CHK: lt gy, gy brn, sft, occ mod frm, sb blk-y-sb pty, rthy-sb wxy, v calc	90% MRL: dkgy, mod sft-sl frm, sb blk-y-sb pty, rthy tex, tr mot, occ calc frags, v calc 10% CHK: lt gy, gy brn, sft, occ mod frm, sb blk-y-sb pty, rthy-sb wxy, v calc	90% MRL: dkgy, mod sft-sl frm, sb blk-y-sb pty, rthy tex, tr mot, occ calc frags, v calc 10% CHK: lt gy, gy brn, sft, occ mod frm, sb blk-y-sb pty, rthy-sb wxy, v calc	75% MRL: dkgy pty, rthy tex, tr mot, occ calc frags, v calc 25% CHK: lt gy, blk-y-sb pty, rthy
---	---	---	---	--







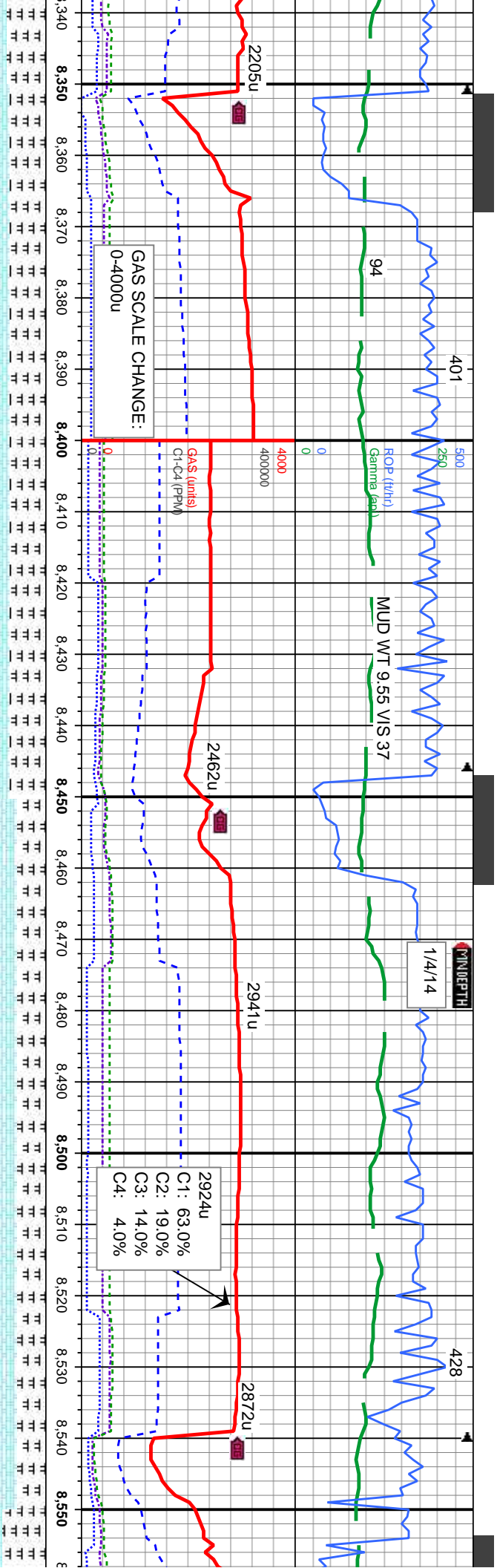
MD: 8,189'  
TVD: 6,633.43'  
Inclination: 90.9°  
Azimuth: 269.26°  
VS: 1,474.39'

MD: 8,283'  
TVD: 6,631.45'  
Inclination: 91.51°  
Azimuth: 269.73°  
VS: 1,565.99'

mod sft-sl frm, sb blk-y-sb mot, occ calc frags, v calc	60% MRL: dkgy, mod sft-sl frm, sb blk-y-sb ply, rhy tex, tr mot, occ calc frags, v calc 40% CHK: lt gy, gy brn, sft, occ mod frm, sb blk-y-sb ply, rhy-sb wxy, v calc	60% MRL: dkgy, mod sft-sl frm, sb blk-y-sb ply, rhy tex, tr mot, occ calc frags, v calc 40% CHK: lt gy, gy brn, sft, occ mod frm, sb blk-y-sb ply, rhy-sb wxy, v calc	70% MRL: dkgy, mod sft-sl frm, sb blk-y-sb ply, rhy tex, tr mot, occ calc frags, v calc 30% CHK: lt gy, gy brn, sft, occ mod frm, sb blk-y-sb ply, rhy-sb wxy, v calc	55% MRL: dkgy, mod sft-sl frm, sb blk-y-sb ply, rhy tex, tr mot, occ calc frags, v calc 45% CHK: lt gy, gy brn, sft, occ mod frm, sb blk-y-sb ply, rhy-sb wxy, v calc
--	--	--	--	--







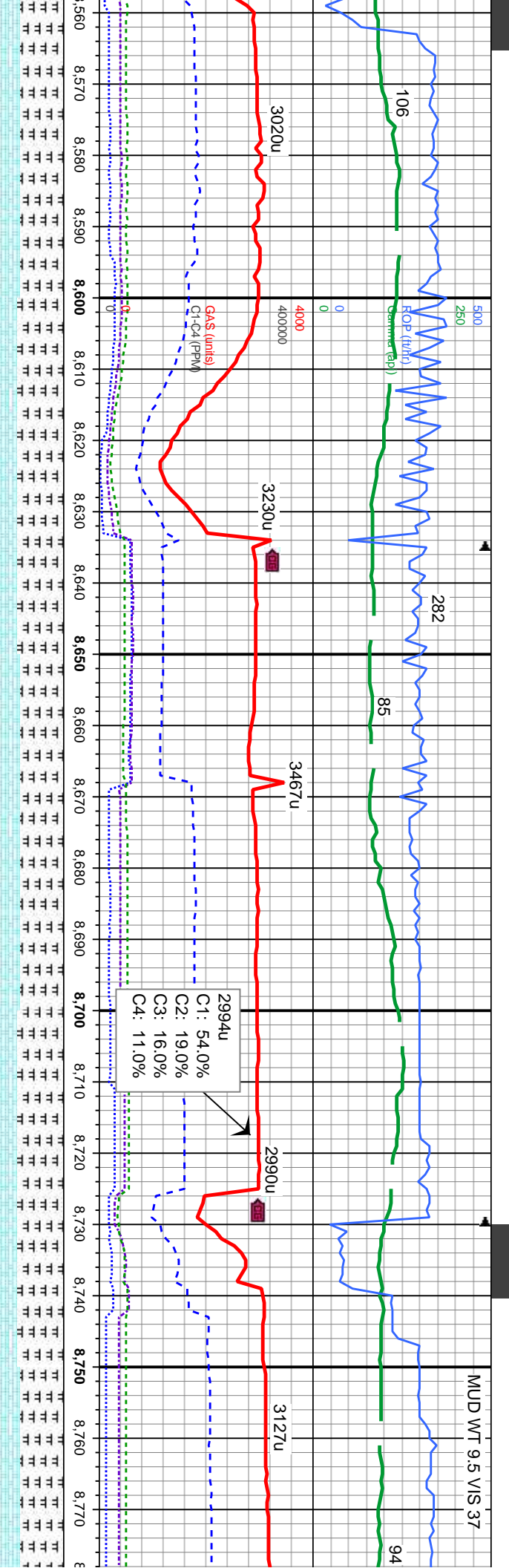
MD: 8,378'  
TVD: 6,629.97'  
Inclination: 90.28 °  
Azimuth: 269.76 °  
VS: 1,658.48'

MD: 8,473'  
TVD: 6,631.84'  
Inclination: 87.47 °  
Azimuth: 269.18 °  
VS: 1,751.05'

blky-sb	50% MRL: dkgy, mod sft-sl frm, sb blky-sb	50% MRL: dkgy, mod sft-sl frm, sb blky-sb	60% CHK: lt gy, gy brn, sft, occ mod frm, sb	60% CHK: lt gy, gy brn, sft, occ mod frm, sb	60% M
ply, rthy tex, tr mot, occ calc frags, v calc	ply, rthy tex, tr mot, occ calc frags, v calc	ply, rthy tex, tr mot, occ calc frags, v calc	blky-sb ply, rthy-sb wxy, v calc	blky-sb ply, rthy-sb wxy, v calc	ply, rth
50% CHK: lt gy, gy brn, sft, occ mod frm, sb	50% CHK: lt gy, gy brn, sft, occ mod frm, sb	50% CHK: lt gy, gy brn, sft, occ mod frm, sb	40% MRL: dkgy, mod sft-sl frm, sb blky-sb	40% MRL: dkgy, mod sft-sl frm, sb blky-sb	40% C
blky-sb ply, rthy-sb wxy, v calc	blky-sb ply, rthy-sb wxy, v calc	blky-sb ply, rthy-sb wxy, v calc	ply, rthy tex, tr -occ mot, occ calc frags, calc	ply, rthy tex, tr -occ mot, occ calc frags, calc	blky-st





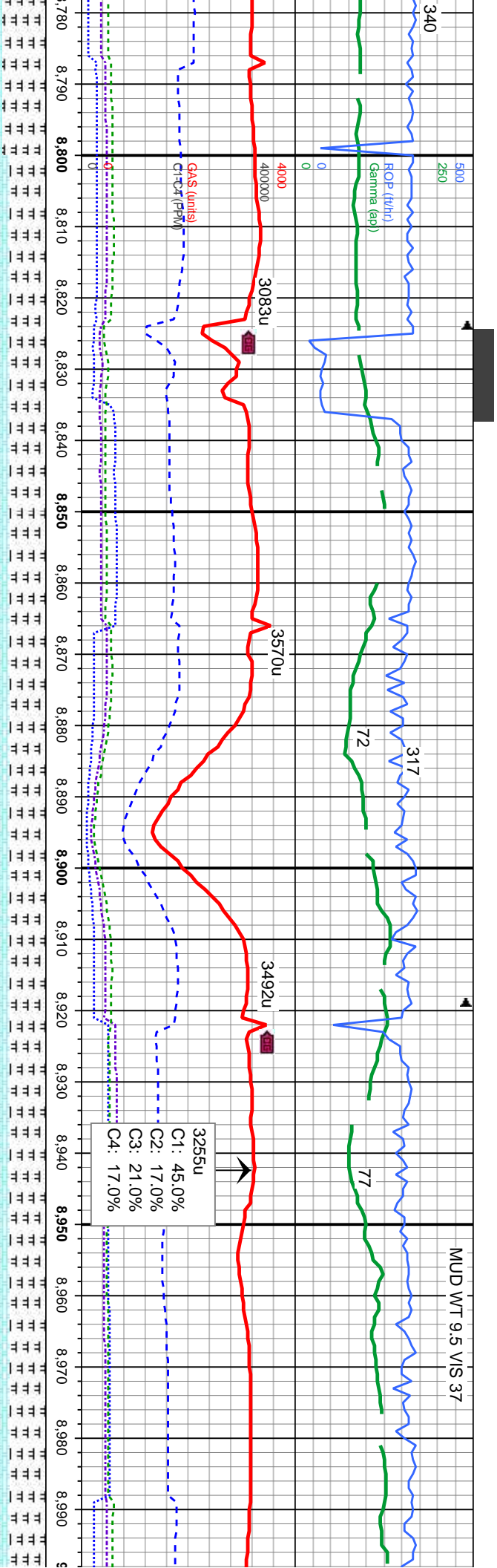


MD: 8,567 TVD: 6,635.33 Inclination: 88.27 ° Azimuth: 268.24 ° VS: 1,842.89 '	6500	MD: 8,663 TVD: 6,636.39 Inclination: 90.46 ° Azimuth: 268.3 ° VS: 1,936.88 '	MD: 8,757 TVD: 6,635.73 Inclination: 90.34 ° Azimuth: 269.27 ° VS: 2,028.75 '
---	------	--	---

RL: dkgy, mod sft-sl frm, sb blkly-sb ply, rthy tex, lt mot, occ calc frags, v calc HK: lt gy, gy brn, sft, occ mod frm, sb ply, rthy-sb wxy, v calc	65% MRL: dkgy, mod sft-sl frm, sb blkly-sb ply, rthy tex, lt mot, occ calc frags, v calc 35% CHK: lt gy, gy brn, sft, occ mod frm, sb blkly-sb ply, rthy-sb wxy, v calc	60% MRL: dkgy, mod sft-sl frm, sb blkly-sb ply, rthy tex, lt mot, occ calc frags, v calc 40% CHK: lt gy, gy brn, sft, occ mod frm, sb blkly-sb ply, rthy-sb wxy, v calc	65% MRL: dkgy, mod sft-sl frm, sb blkly-sb ply, rthy tex, lt mot, occ calc frags, v calc 35% CHK: lt gy, gy brn, sft, occ mod frm, sb blkly-sb ply, rthy-sb wxy, v calc	60% MRL: dkgy, mod sft-sl frm, sb blkly-sb ply, rthy tex, lt mot, occ calc frags, v calc 40% CHK: lt gy, gy brn, sft, occ mod frm, sb blkly-sb ply, rthy-sb wxy, v calc
---	--	--	--	--







MD: 8,852'  
TVD: 6,637.03'  
Inclination: 88.09°  
Azimuth: 268.7°  
VS: 2,121.51'

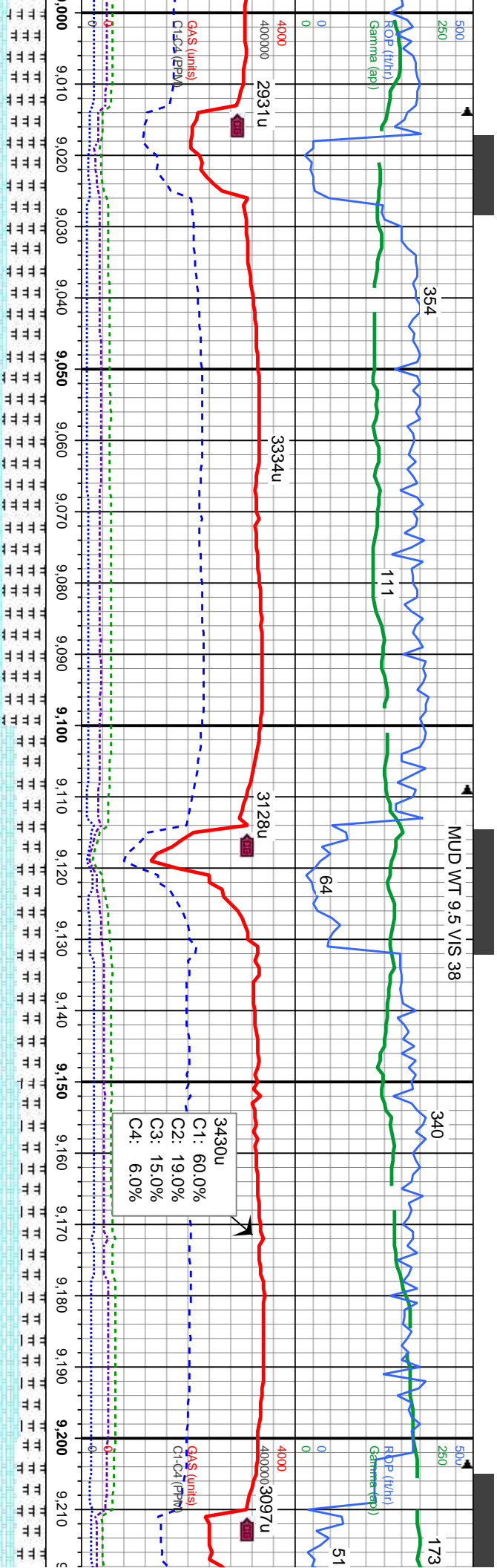
MD: 8,947'  
TVD: 6,641.01'  
Inclination: 87.1°  
Azimuth: 268.2°  
VS: 2,214.4'

lt frm, sb blkly-sb calc frags, v calc	50% CHK: lt gy, gy brn, sft, occ mod frm, sb blkly-sb plty, rthy-sb wxy, v calc	50% CHK: lt gy, gy brn, sft, occ mod frm, sb blkly-sb plty, rthy-sb wxy, v calc	50% CHK: lt gy, gy brn, sft, occ mod frm, sb blkly-sb plty, rthy-sb wxy, v calc	50% CHK: lt gy, gy brn, sft, occ mod frm, sb blkly-sb plty, rthy-sb wxy, v calc
lt, occ mod frm, sb calc	50% MRL: dkgy, mod sft-sl frm, sb blkly-sb plty, rthy tex, tr -occ mot, occ calc frags, calc	50% MRL: dkgy, mod sft-sl frm, sb blkly-sb plty, rthy tex, tr -occ mot, occ calc frags, calc	50% MRL: dkgy, mod sft-sl frm, sb blkly-sb plty, rthy tex, tr -occ mot, occ calc frags, calc	50% MRL: dkgy, mod sft-sl frm, sb blkly-sb plty, rthy tex, tr -occ mot, occ calc frags, calc

TVD (ft)







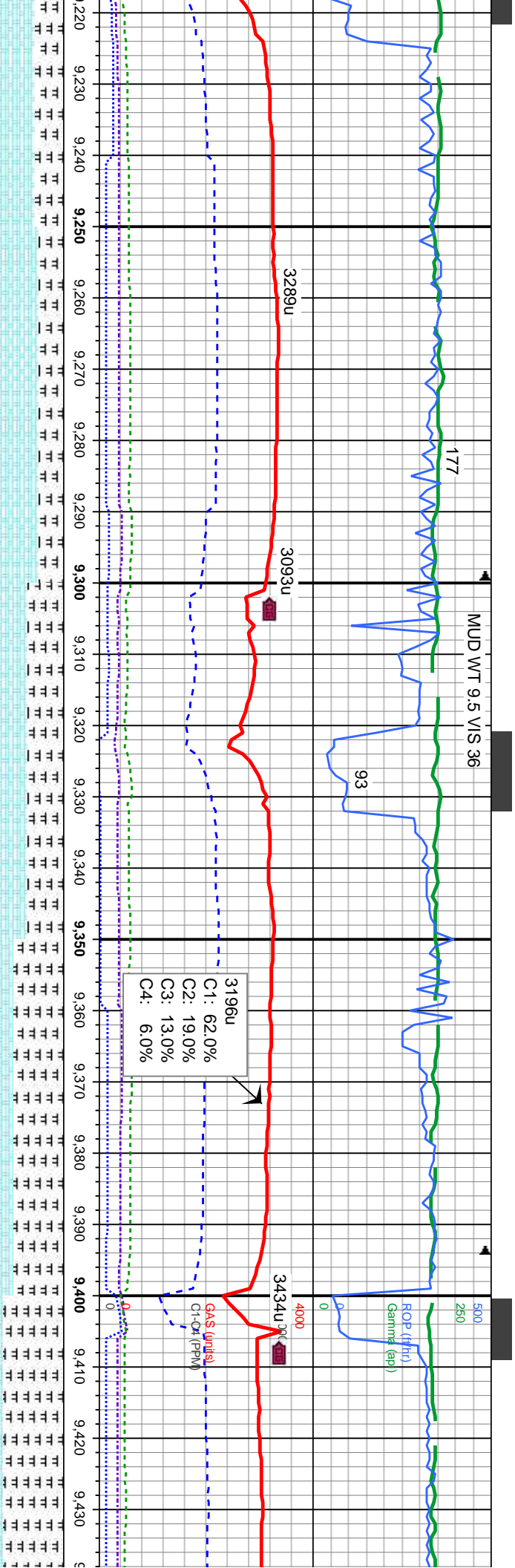
MD: 9,042'  
TVD: 6,646.73'  
Inclination: 87.25 °  
Azimuth: 266.86 °  
VS: 2,307.43'

MD: 9,137'  
TVD: 6,650.51'  
Inclination: 88.18 °  
Azimuth: 266.44 °  
VS: 2,400.89'

55% MARL: med-dk gy, blk, occ spd wh, mod sft-frn, sb blk-y-sb pty, mot, rthy-sily tex, mot, occ sl vit lstr, v calc, tr bent	60% MARL: med-dk gy, blk, occ spd wh, mod sft-frn, sb blk-y-sb pty, mot, rthy-sily tex, mot, occ sl vit lstr, v calc, tr bent	60% CHK: wh-lt gy, med gy-brn, crm ip, sft, frn ip, sb blk-y-sb pty, mot, rthy-wxy ip, v calc	65% CHK: wh-lt gy, med gy-brn, crm ip, sft, frn ip, sb blk-y-sb pty, mot, rthy-wxy ip, v calc	60% CHK: wh-lt gy, med gy-brn, crm ip, sft, frn ip, sb blk-y-sb pty, mot, rthy-wxy ip, v calc
45% CHK: lt-med gy, occ wh, gy brn, sft, frn ip, sb blk-y-sb pty, mot, rthy-wxy ip, v calc	40% CHK: lt-med gy, occ wh, gy brn, sft, frn ip, sb blk-y-sb pty, mot, rthy-wxy ip, v calc	40% MARL: med-dk gy, blk ip, mod sft-frn, sb blk-y-sb pty, mot, rthy-sily tex, mot, occ sl vit lstr, v calc, tr bent	35% MARL: med-dk gy, blk ip, mod sft-frn, sb blk-y-sb pty, mot, rthy-sily tex, mot, occ sl vit lstr, v calc, tr bent	40% MARL: med-dk gy, blk ip, mod sft-frn, sb blk-y-sb pty, mot, rthy-sily tex, mot, occ sl vit lstr, v calc







MD: 9,232'  
TVD: 6,652.76'  
Inclination: 89.11°  
Azimuth: 265.62°  
VS: 2,494.57'

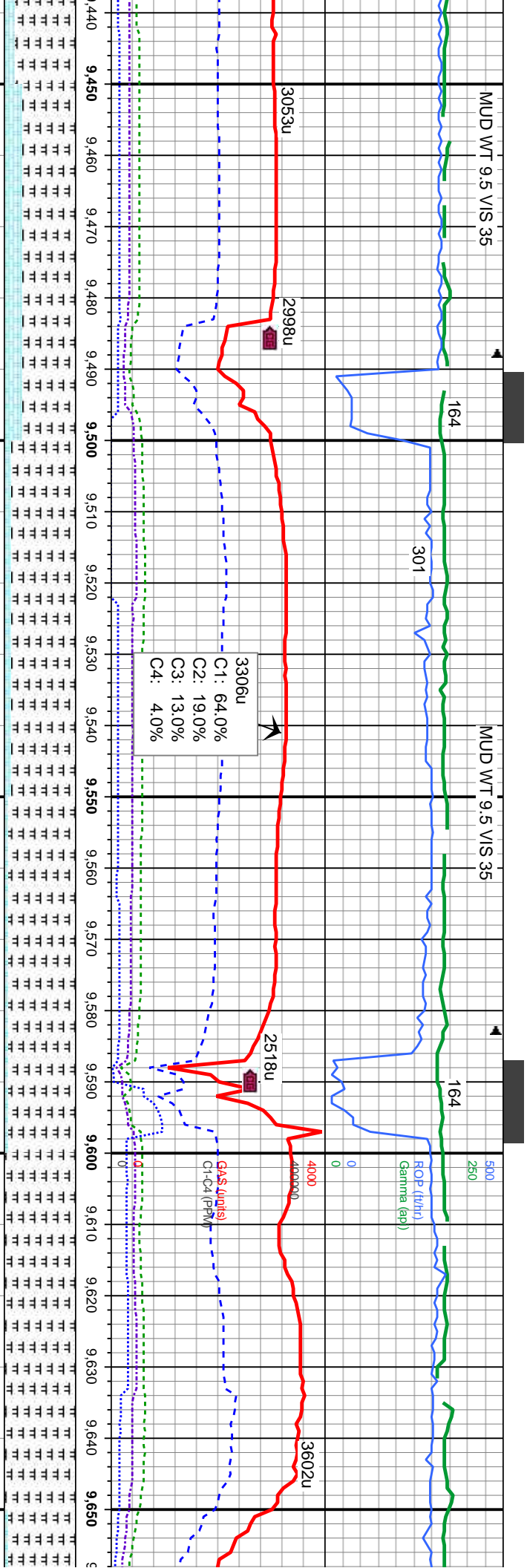
MD: 9,327'  
TVD: 6,652.66'  
Inclination: 91.02°  
Azimuth: 267°  
VS: 2,588.19'

MD: 9,421'  
TVD: 6,652.31'  
Inclination: 89.41°  
Azimuth: 266.87°  
VS: 2,680.65'

gy, med gy-brn, crm ip, sft, ply, mot, rthy-wxy ip, v calc	65% CHK: wh-lt gy, med gy-brn, crm ip, sft, frm ip, sb blk-y-sb ply, mot, rthy-wxy ip, v calc	50% MARL: med-dk gy, blk, occ spd wh, mod sft-frm, sb blk-y-sb ply, mot, rthy-sily tex, mot, occ sl vit lstr, v calc, tr bent	70% MARL: med-dk gy, blk, occ spd wh, mod sft-frm, sb blk-y-sb ply, mot, rthy-sily tex, mot, occ sl vit lstr, v calc, tr bent	85% MARL: med-dk gy, blk, occ sp mod sft-frm, sb blk-y-sb ply, mot, rth
-dk gy, blk ip, mod sft-frm, sb rthy-sily tex, mot, occ sl vit	sb blk-y-sb ply, mot, rthy-sily tex, mot, occ sl vit lstr, v calc, tr bent	50% CHK: lt-med gy, occ wh, gy brn, sft, frm ip, sb blk-y-sb ply, mot, rthy-wxy ip, v calc	30% CHK: lt-med gy, occ wh, gy brn, sft, frm ip, sb blk-y-sb ply, mot, rthy-wxy ip, v calc	15% CHK: lt-med gy, occ wh, gy br ip, sb blk-y-sb ply, mot, rthy-wxy ip, v calc







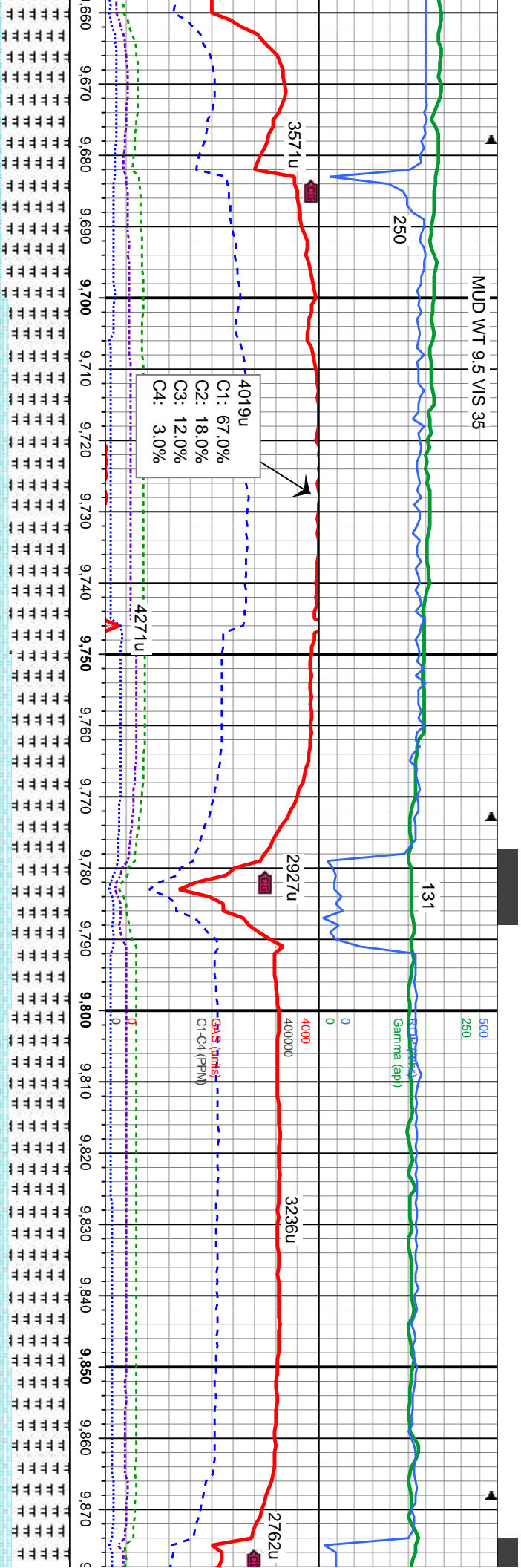
MD: 9,516'  
TVD: 6,652.79'  
Inclination: 90 °  
Azimuth: 270.08 °  
VS: 2,773.6'

MD: 9,611'  
TVD: 6,653.35'  
Inclination: 89.32 °  
Azimuth: 269.24 °  
VS: 2,866.13'

d wh, sly-sly tex,	75% MARL: med-dk gy, blk, occ spd wh, mod sft-frm, sb blkly-sb plty, mot, rthy-sly tex, mot, occ sl vit lstr, v calc, tr bent	90% MARL: med-dk gy, blk, occ spd wh, mod sft-frm, sb blkly-sb plty, mot, rthy-sly tex, mot, occ sl vit lstr, v calc, tr bent	95% MARL: med-dk gy, blk, occ spd wh, mod sft-frm, sb blkly-sb plty, mot, rthy-sly tex, mot, occ sl vit lstr, v calc	100% MRL: med-dk gy, mod sft-sl frm, sb blkly-sb plty, rthy-sly tex, sl mot, occ sl vit lstr, v calc, dissm pyr, occ chk	95% M blkly-st v calc, 5% Ch- blkly-st
n, sft, frm v calc	25% CHK: lt-med gy, occ wh, gy brn, sft, sb blkly-sb plty, mot, rthy-wxy, v calc	10% CHK: lt-med gy, occ wh, gy brn, sft, sb blkly-sb plty, mot, rthy-wxy, v calc	5% CHK: lt-med gy, occ wh, gy brn, sft, sb blkly-sb plty, mot, rthy-wxy, v calc		







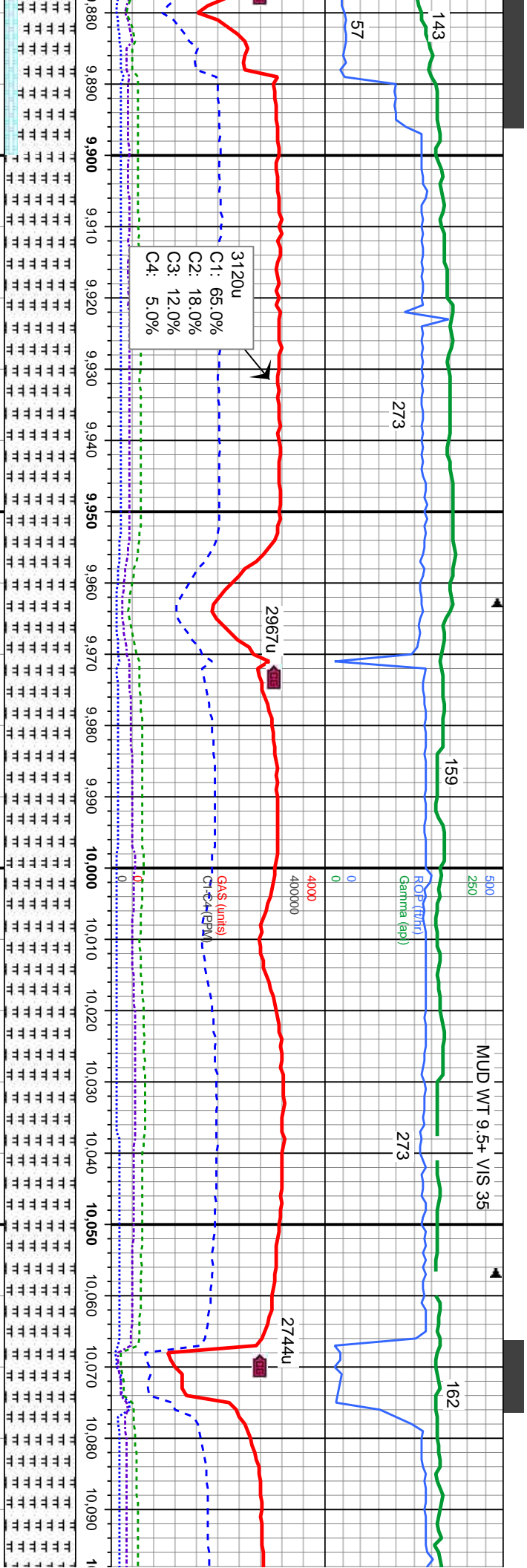
MD: 9,706'  
TVD: 6,653.76'  
Inclination: 90.19°  
Azimuth: 269.38°  
VS: 2,958.78'

MD: 9,801'  
TVD: 6,653.99'  
Inclination: 89.54°  
Azimuth: 267.53°  
VS: 3,051.74'

RL: med-dk gy, mod sft-sl frm, sb	85% MRL: med-dk gy, mod sft-sl frm, sb	80% MRL: med-dk gy, mod sft-sl frm, sb	85% MRL: med-dk gy, mod sft-sl frm, sb	80% MRL: med-dk gy, mod sft-sl frm, sb
ply, rthy-sily tex, sl mot, occ sl vit lstr,	blky-sb ply, rthy-sily tex, sl mot, occ sl vit lstr, v calc	blky-sb ply, rthy-sily tex, sl mot, occ sl vit lstr, v calc	blky-sb ply, rthy-sily tex, sl mot, occ sl vit lstr, v calc	blky-sb ply, rthy-sily tex, sl mot, occ sl vit lstr, v calc
dissem pyr, occ chk	15% CHK: lt-med gy, occ wh, gy brn, sft, sb	20% CHK: lt-med gy, occ wh, gy brn, sft, sb	15% CHK: lt-med gy, occ wh, gy brn, sft, sb	20% CHK: lt-med gy, occ wh, gy brn, sft, sb
ply, mot, rthy-wxy, v calc	blky-sb ply, mot, rthy-wxy, v calc	blky-sb ply, mot, rthy-wxy, v calc	blky-sb ply, mot, rthy-wxy, v calc	blky-sb ply, mot, rthy-wxy, v calc





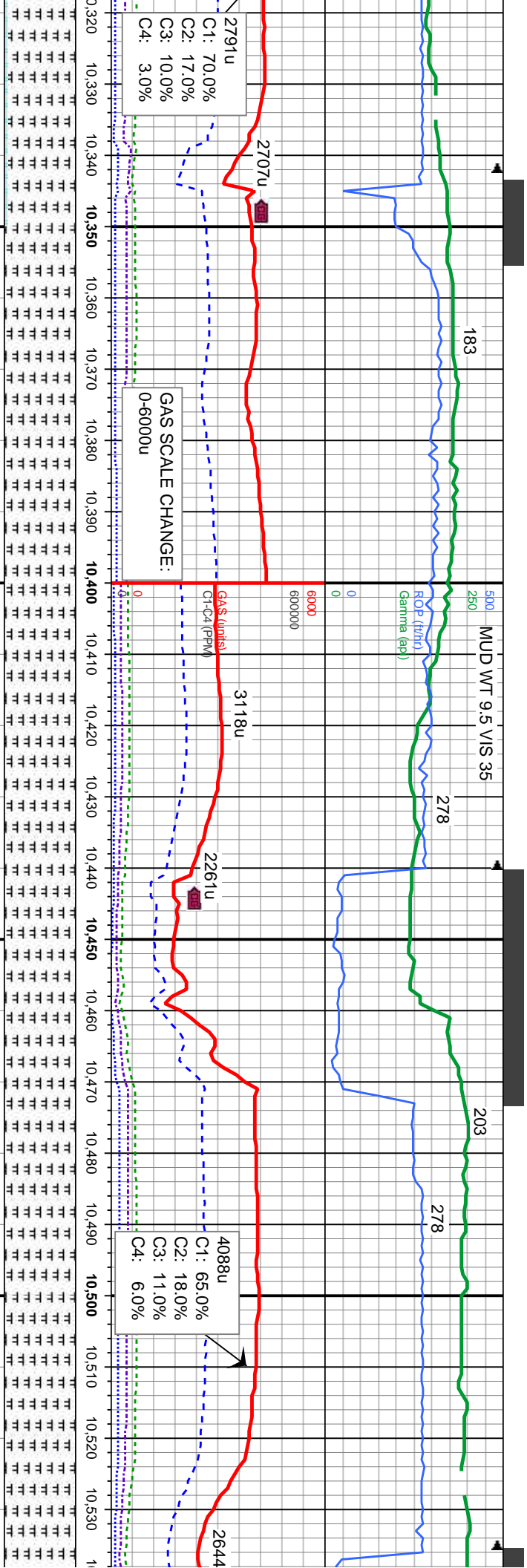


sd sft-sl frm, sb sl mot, occ sl vit	100% MRL: med-dk gy, mod sft-sl frm, sb blky-sb pty, rthy-sily tex, sl mot, occ sl vit lstr, v calc	100% MRL: med-dk gy, mod sft-sl frm, sb blky-sb pty, rthy-sily tex, sl mot, occ sl vit lstr, v calc	100% MRL: med-dk gy, mod sft-sl frm, sb blky-sb pty, rthy-sily tex, sl mot, occ sl vit lstr, v calc
---	---	---	---









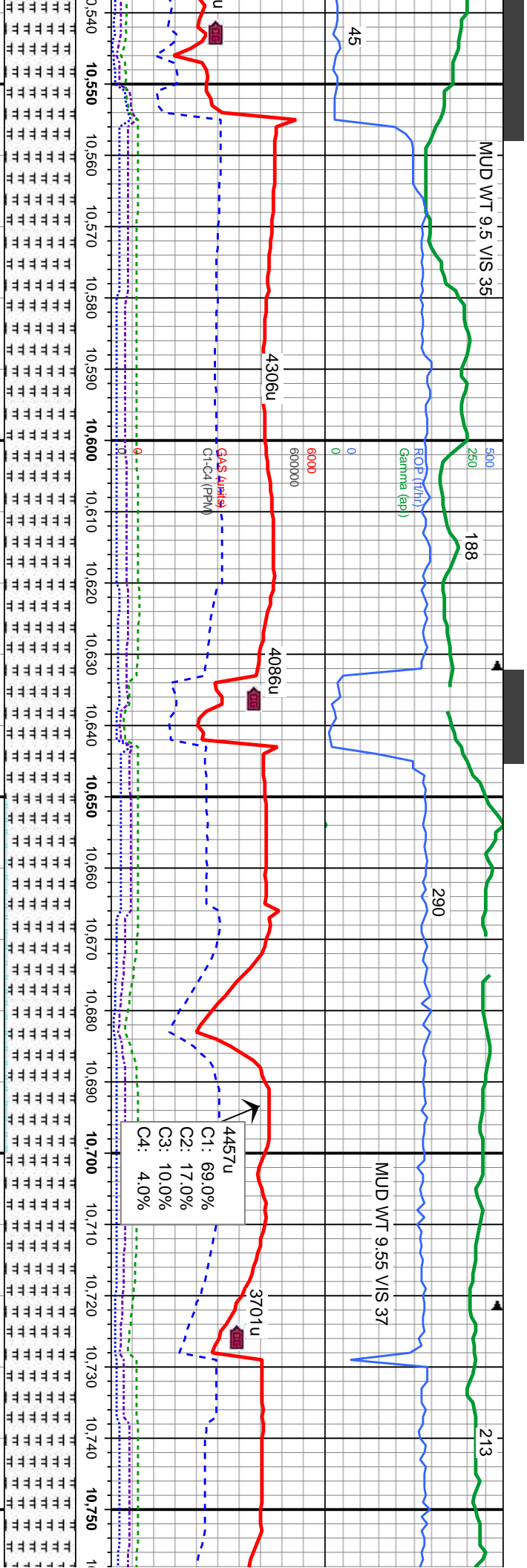
MD: 10,370'  
TVD: 6,665.27'  
Inclination: 88.65°  
Azimuth: 264.84°  
VS: 3,611.86'

POSSIBLE FAULT @ 10,454'  
MAY HAVE FAULTED UP TO THE "A" MARL

MD: 10,465'  
TVD: 6,665.63'  
Inclination: 90.92°  
Azimuth: 267.37°  
VS: 3,705.54'

dk gy, mod sft-sl frm, sb	100% MRL: med-dk gy, mod sft-sl frm, sb	100% MRL: med-dk gy, mod sft-sl frm, sb	100% MRL: med-dk gy, mod sft-sl frm, sb
slty tex, sl mot, occ sl vit lstr,	blky-sb ppty, rthy-slty tex, sl mot, occ sl vit lstr, v calc	blky-sb ppty, rthy-slty tex, sl mot, tr-occ calc frags, occ sl vit lstr, v calc	blky-sb ppty, rthy-slty tex, sl mot, tr calc frags, occ sl vit lstr, v calc
gy, occ wh, gy brn, sft, sb			
rthy-wxy, v calc			





frm, sb calc frags,	MD: 10,560' TVD: 6,664.09' Inclination: 90.92 ° Azimuth: 269.25 ° VS: 3,798.53'	6500	MD: 10,655' TVD: 6,663.15' Inclination: 90.22 ° Azimuth: 269.52 ° VS: 3,891.16'	100% MRL: med-dk gy, mod sft-sl frm, sb blky-sb ply, rthy-slty tex, sl mot, sl tr calc frags, sl vit lstr, v calc	6850	MD: 10,750' TVD: 6,661.95' Inclination: 91.23 ° Azimuth: 269.85 ° VS: 3,983.68'	100% MRL: med-dk gy, mod sft-sl frm, sb blky-sb ply, rthy-slty tex, sl mot, vit lstr, v calc	100% MRL: med-dk gy, mod sft-sl frm, sb blky-sb ply, rthy-slty tex, sl mot, vit lstr, v calc







