

COLUMBINE LOGGING

Scale: 5" / 100'
Measured Depth Log

Well Name Wells RanchAA26-65HN(HORZ PLOT)

Location Section 25, Township 6 North, Range 63 West

State Colorado

Country USA

API Number 05-123-37568-0000

Region Wells Ranch; DJ Basin

Spud Date 9/19/2013

Surface Coordinates 1824' FSL
153' FWL

Bottom Hole Coordinates 2640' FSL
150' FWL

Ground Elevation 4791'

Logged Interval 1000 To 11256'

Formation TEEPEE BUTTES; Niobrara C Chalk

Type of Drilling Fluid Mud; Water; Poly

County Weld

Rig Number H&P 322

Field Wattenberg

Drilling Completed 9/24/2013

K.B. Elevation 4815'

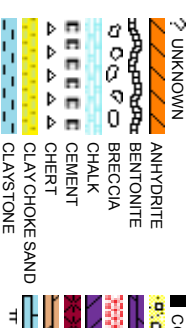
Total Depth 10665'

Company Bonanza Creek

Name Paul McKay

Company Bonanza Creek

Address 410 17th Street
Denver, CO 80202



Operator

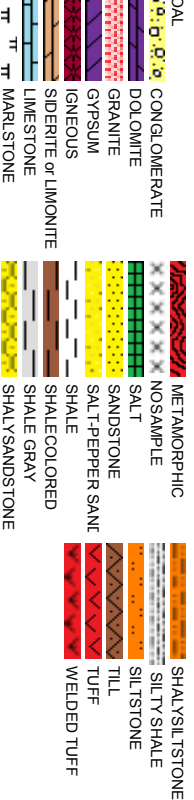
Energy Inc.

Geologist

Energy Inc.

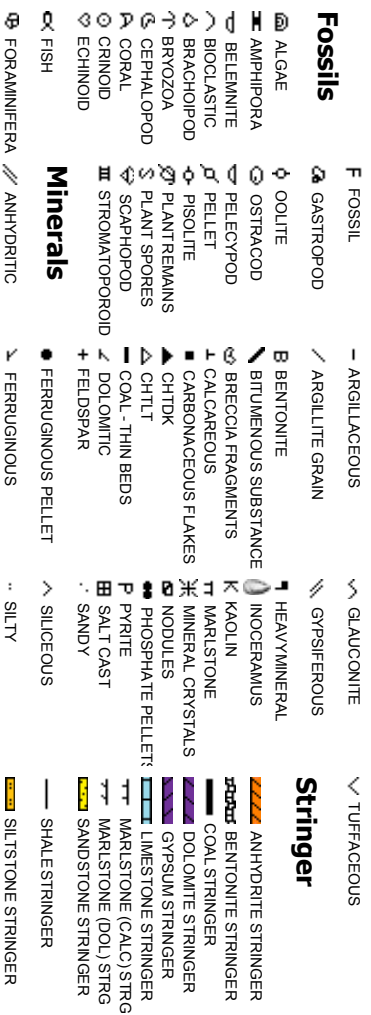
Suite 1500
202

Rock Types



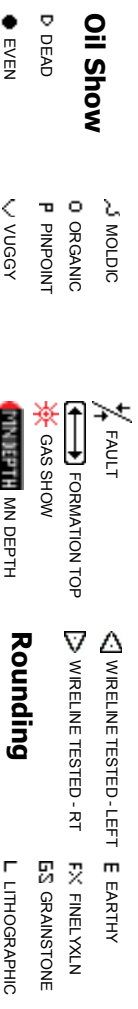
Accessories

Fossils

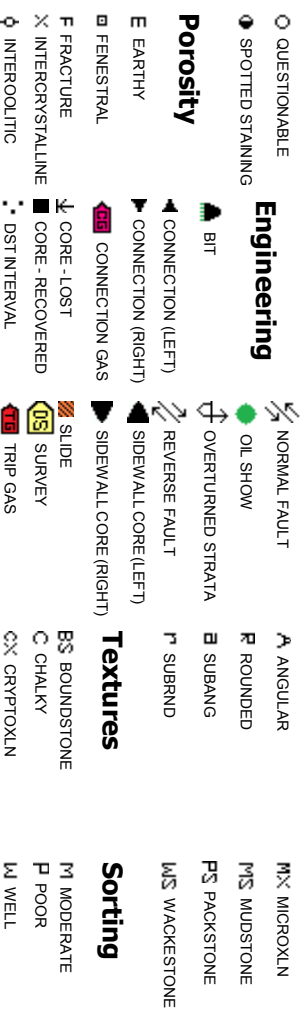


Other Symbols

Oil Show

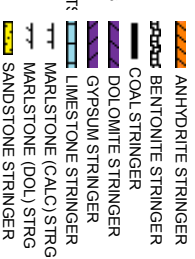


Engineering



Textures

Sorting

Springer

ROP
ROF
GAMMA

Began Build @
6104' MD23:28
hrs, 08/20/2013

BEGIN 50'
SAMPLE
INTERVALS

MUD WT 9.5 VIS 35

3067u
C1: 96.8%
C2: 1.9%
C3: 0.9%
C4: 0.4%

COLUMBINE LOGGING INC. RIGGED UP
ON 09/18/2013 MANNED 2-PERSON
LOGGING WITH BLOODHOUND GAS
CHROMATOGRAPH #0315

ROP (ft/hr)
GAMMA (API)
GAS (units)
C1-C4 (PPM)

Depth Labels

% Lith

100% SILTY SH: med gy - gy, occ dk gy, mod
sft - mod firm, sb pty - sb blk, shy - silty tex,
non calc

100% SILTY SH: med gy - gy, occ dk gy, mod
sft - mod firm, sb pty - sb blk, shy - silty tex,
non calc

95% SILTY SH: m-dk gy occ gy brn, firm-sil
sft, rthy-sil silty r
5% SHY SS: wh - lt gy sme s&p, f gr, sb rd-
sb ang, fr srt, fin, mod por, arg cmt, occ biot

100% SILTY SH: med gy - gy, occ c
mod sft - mod firm, sb pty - sb blk
silty tex, non calc

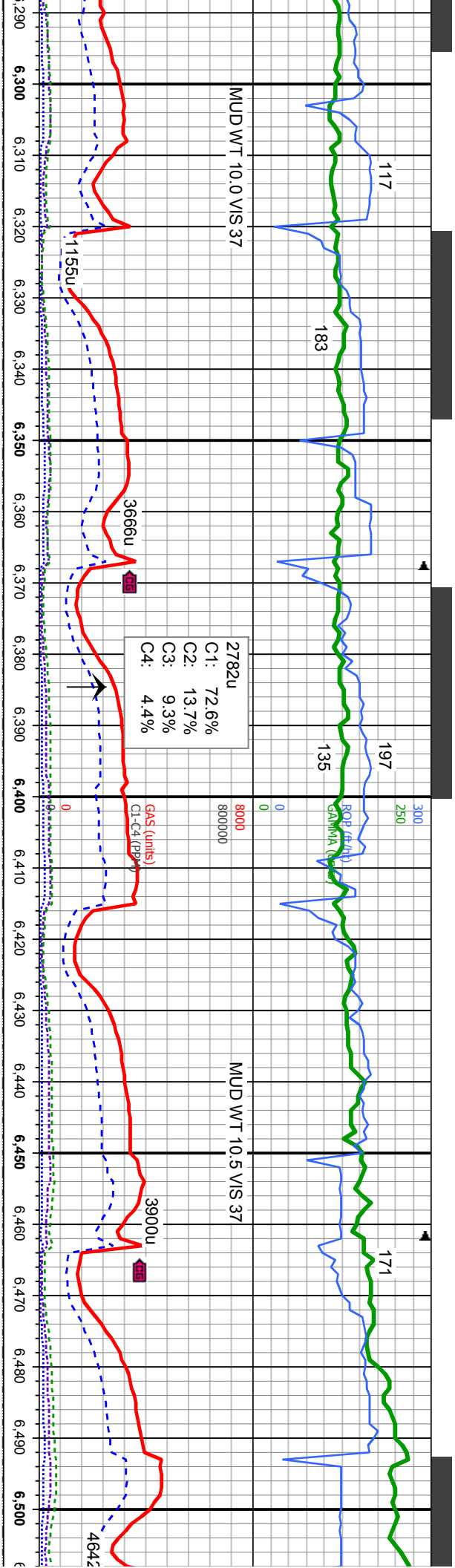
Well Bore
TVD

MD: 6,107'	MD: 6,120'	MD: 6,167'	MD: 6,215'	MD: 6,262'
TVD: 6,040.89'	TVD: 6,053.71'	TVD: 6,099.93'	TVD: 6,146.59'	TVD: 6,191.41'
Inclination: 9.25 °	Inclination: 9.63 °	Inclination: 11.28 °	Inclination: 15.74 °	Inclination: 19.24 °
Azimuth: 308.19 °	Azimuth: 306.58 °	Azimuth: 307.47 °	Azimuth: 304.1 °	Azimuth: 303.01 °
VS: 595.2'	VS: 597.06'	VS: 604.55'	VS: 614.52'	VS: 627.31'
BHA # 2				
Bit Size: 8.750				
Manufacturer: Schlumberger/Smith				
Model: SD1611				
Serial Number: JH2523				
Nozzles: 6x14				
Motor Number:				
Manufacturer: Sperry Drilling				
Model: Sperry Drill				
Serial Number: 675-0161				
Bend: 2.0				

Oil Show

Images





100% SILTY SH: med gy - gy, occ dk gy, mod sft - mod firm, sb pily - sb blkly, shy - silty tex, non calc, tr ss

100% SILTY SH: med gy - gy, occ dk gy, mod sft - mod firm, sb pily - sb blkly, shy - silty tex, non calc,

57% 100% SILTY SH: med gy - gy, occ dk gy, mod sft - mod firm, sb pily - sb blkly, shy - silty tex, non calc, tr ss

100% SILTY SH: med gy - gy, occ dk gy, mod sft - mod firm, sb pily - sb blkly, shy - silty tex, non calc

100% mod sft - mod firm, sb pily - sb blkly, shy - silty tex

MD: 6.310
TVD: 6.236.3
Inclination: 22.21 °
Azimuth: 298.79 °
VS: 643.01'

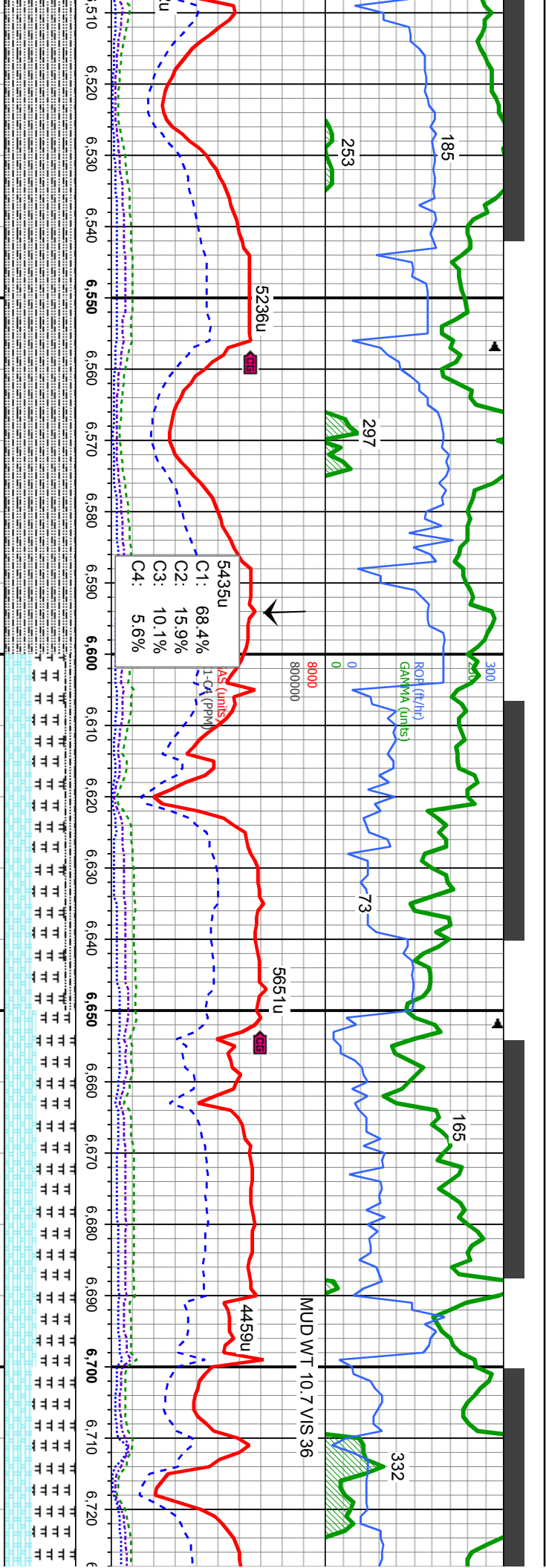
MD: 6.357
TVD: 6.279.29
Inclination: 25.45 °
Azimuth: 294.17 °
VS: 661.06'

MD: 6.404
TVD: 6.320.78
Inclination: 30.56 °
Azimuth: 290.58 °
VS: 682.47'

MD: 6.451
TVD: 6.360.26
Inclination: 35.13 °
Azimuth: 288.73 °
VS: 707.47'

MD: 6.499
TVD: 6.398.62
Inclination: 38.
Azimuth: 291.4
VS: 735.7'

7000



100% SILTY SH: med gy - gy, occ dk gy, mod sft - mod firm, sb ply - sb blkly, shy - silty tex, non calc, abnt scat bent

Sharon Springs
6561' MD, 6445' TVD

45% MRL: m - dkgy, mod sft-sil firm, sbblkly-sbply, rthy-silty tex, sl mot, occ sl vit lstr, v calc 40% CHK: lt gy - gy, occ lt bm, mod sft - sft, occ firm, blkly - sbblkly, wxy - rthy tex, v calc, tr dism pyr, tr bent 15% SILTY SH: med gy - gy, occ dk gy, mod sft - mod firm, sb ply - sb blkly, tex, non calc

55% MRL: m - dkgy, mod sft-sil firm, sbblkly-sbply, rthy-silty tex, sl mot, occ sl vit lstr, v calc 45% CHK: lt gy - gy, occ lt bm, sft, occ mod firm, sb blkly - sb ply, wxy - rthy tex, v calc

A Marl
6662' MD, 6512' TVD

60% MRL: m - dkgy, mod sft-sil firm, sbblkly-sbply, rthy-silty tex, sl mot, occ sl vit lstr, v calc 40% CHK: lt gy - gy, occ firm, sb blkly - sb ply, wxy

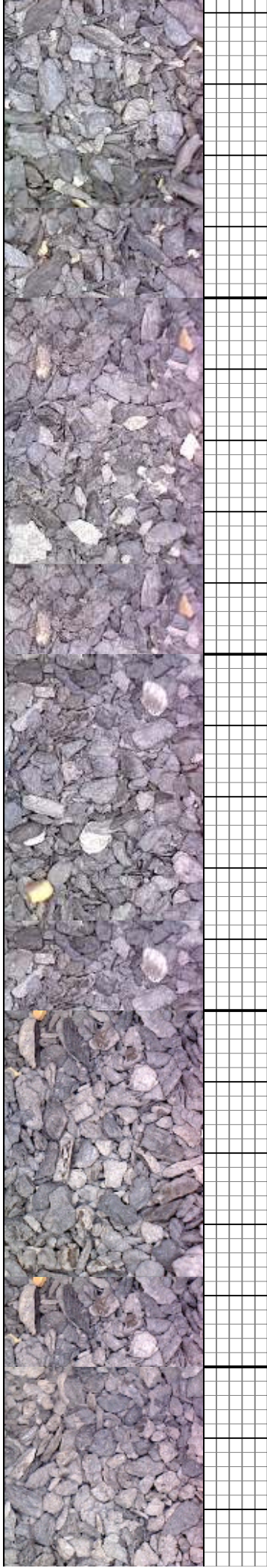
MD: 6,546'
TVD: 6,434.15'
Inclination: 43.02 °
Azimuth: 295.62 °
VS: 765.36'

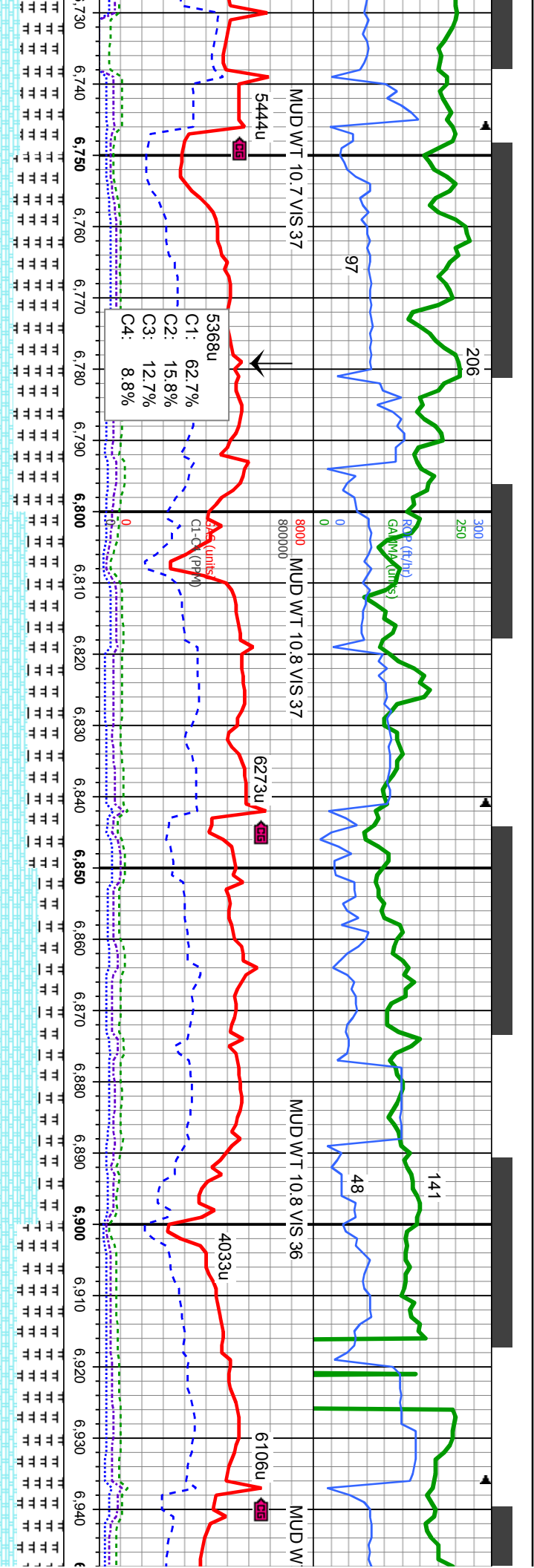
MD: 6,594'
TVD: 6,468.22'
Inclination: 46.55 °
Azimuth: 297.55 °
VS: 797.47'

A Chalk
6621' MD, 6486' TVD

MD: 6,641'
TVD: 6,499.22'
Inclination: 50.9 °
Azimuth: 296.09 °
VS: 830.98'

MD: 6,689'
TVD: 6,527.93'
Inclination: 55.61 °
Azimuth: 292.79 °
VS: 867.93'

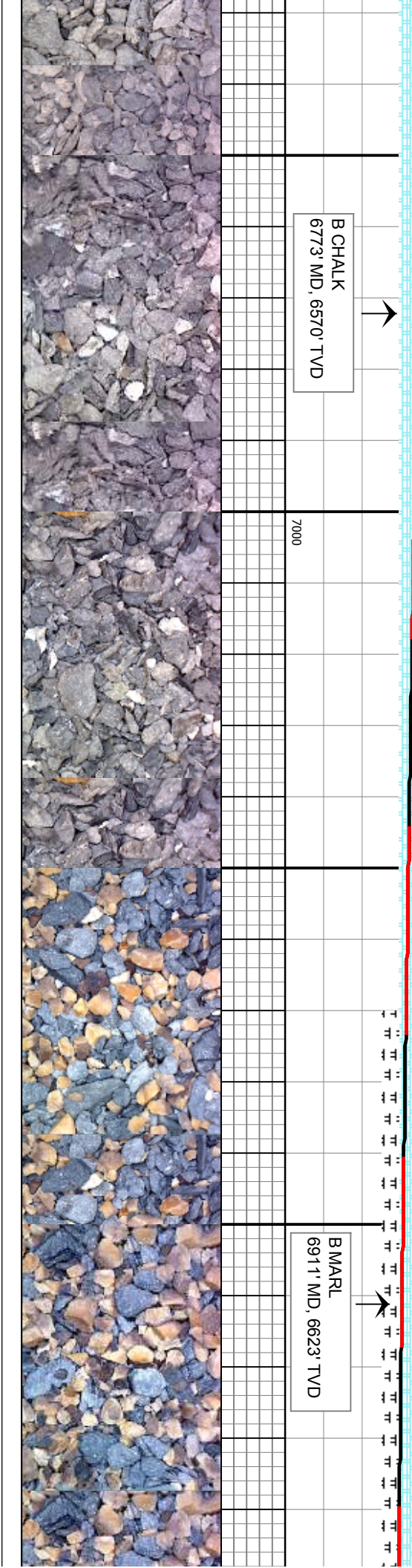




70% MRU: m - dkgy, mod sft-sl firm, sbblky-sbply, rthy-sily tex, sl mot, occ sl vit	5750	65% CHK: It gy - gy, occ It brn, sme cm, sft, occ mod firm, sb blkly - sb ply, wxy - rthy tex, v calc	65% MRU: m - dkgy, mod sft-sl firm, sbblky-sbply, rthy-sily tex, sl mot, occ sl vit
It brn, sft, occ mod -rthy tex, v calc	MD: 6,736	MD: 6,831	MD: 6,879
TVD: 6,552.78'	TVD: 6,594.8	TVD: 6,612.68'	TVD: 6,926
Inclination: 60.56 °	Inclination: 66.55 °	Inclination: 69.73 °	Inclination: 73.1 °
Azimuth: 288.38 °	Azimuth: 280.77 °	Azimuth: 276.94 °	Azimuth: 273.94 °
VS: 906.91'	VS: 991.57'	VS: 1,036.1'	VS: 1,080.58'

B CHALK
6773' MD, 6570' TVD

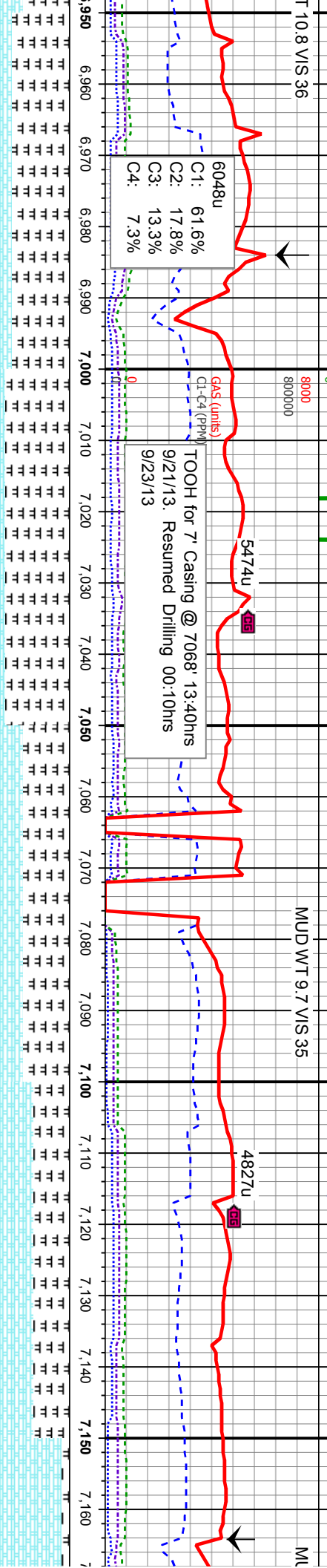
B MARL
6911' MD, 6623' TVD



BHA # 3
Bit Size: 6.125
Manufacturer: HDBS
Model: MMD54
Serial Number: 12301813
9' Nozzles: 5x11

Motor Number: 3
Manufacturer: Sperry Drilling
Model: Sperry Drill
Serial Number: 475-469
Bend: 1.5

09/22/2013
09/23/2013



C1: 61.6%
C2: 17.8%
C3: 13.3%
C4: 7.3%

TOOH for 7' Casing @ 7068' 13.40hrs
9/21/13: Resumed Drilling 00:10hrs
9/23/13

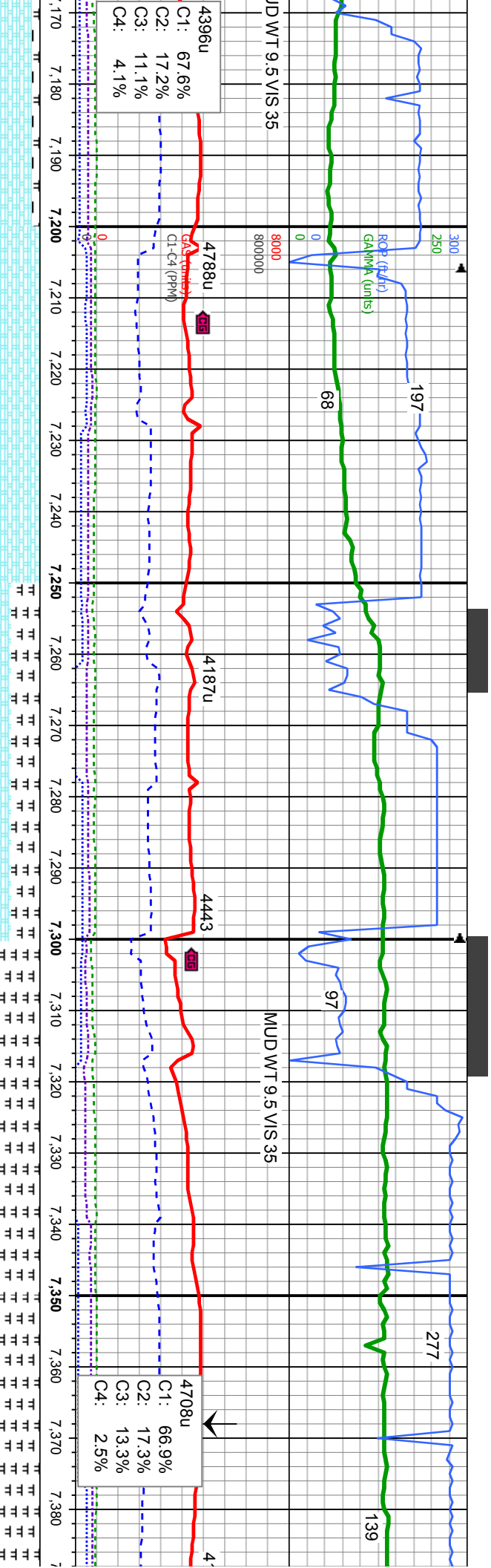
80% MRL: m - dkgy, mod sft-sl firm, sbbiky-sbbply, rthy-slty tex, sl mot, occ sl vit lstr, v calc 20% CHK: lt gy - gy, occ lt brn, sme crm, sft, occ mod firm, sb blkly - sb ply, wxy - rthy tex, v calc; sme scat bent MD: 6,974' TVD: 6,639.88' Inclination: 77.4 ° Azimuth: 271.79 ° VS: 1,126.76'	90% MRL: m - dkgy, mod sft-sl firm, sbbiky-sbbply, rthy-slty tex, sl mot, occ sl vit lstr, v calc 10% CHK: lt gy - gy, occ lt brn, sme crm, sft, occ mod firm, sb blkly - sb ply, wxy - rthy tex, v calc; sme scat bent MD: 7,011' TVD: 6,646.98' Inclination: 80.47 ° Azimuth: 271.51 ° VS: 1,162.82'	65% MRL: m - dkgy, mod sft-sl firm, sbbiky-sbbply, rthy-slty tex, sl mot, occ sl vit lstr, v calc 35% CHK: lt gy - gy, occ lt brn, sme crm, sft, occ mod firm, sb blkly - sb ply, wxy - rthy tex, v calc	50% MRL: m - dkgy, mod sft-sl firm, sbbiky-sbbply, rthy-slty tex, sl mot, occ sl vit lstr, v calc 50% CHK: lt gy - gy, occ lt brn, sft, occ mod firm, sb blkly - sb ply, wxy - rthy tex, v calc	90% CHK: lt gy, occ mod firm, sbbiky-sbbply, v calc, t di
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TVD Scale Change:
6600-6700

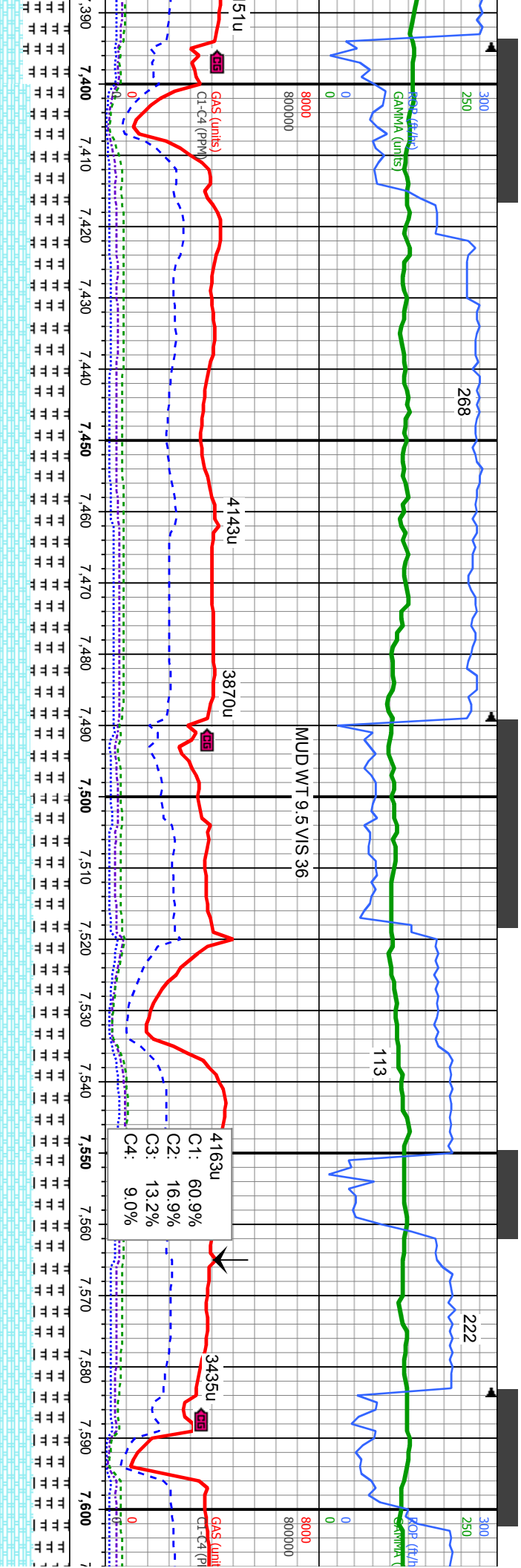
6700

MD: 7,143'
TVD: 6,660.38'
Inclination: 87.87 °
Azimuth: 269.24 °
VS: 1,292.75'

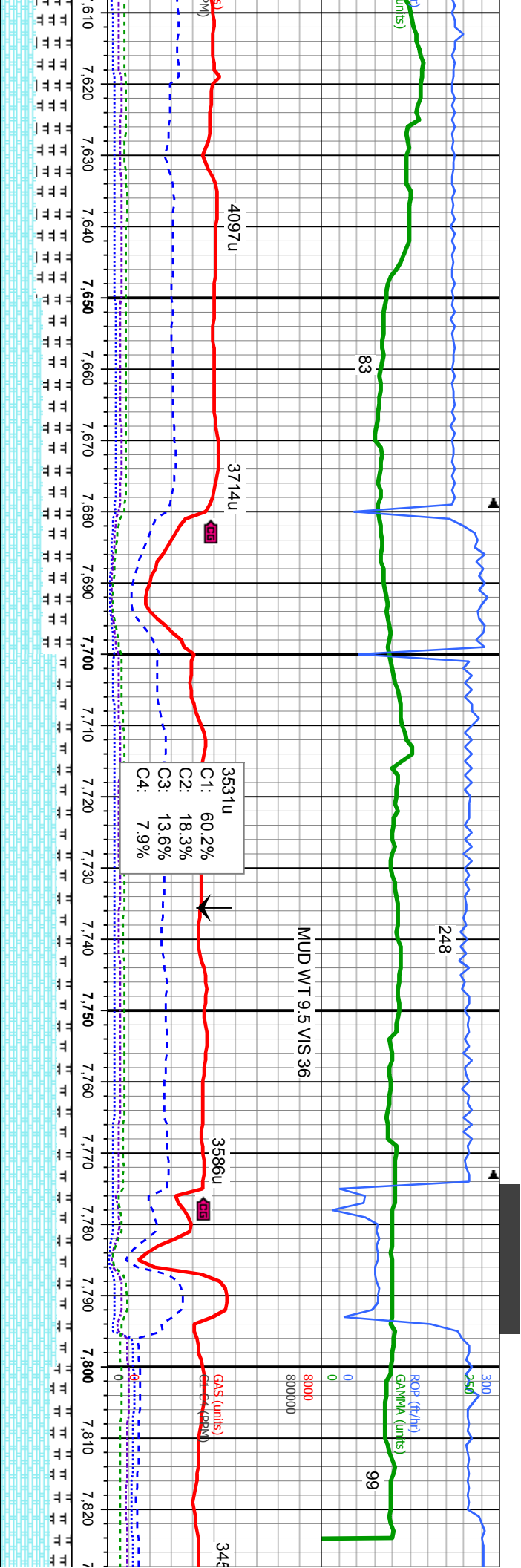




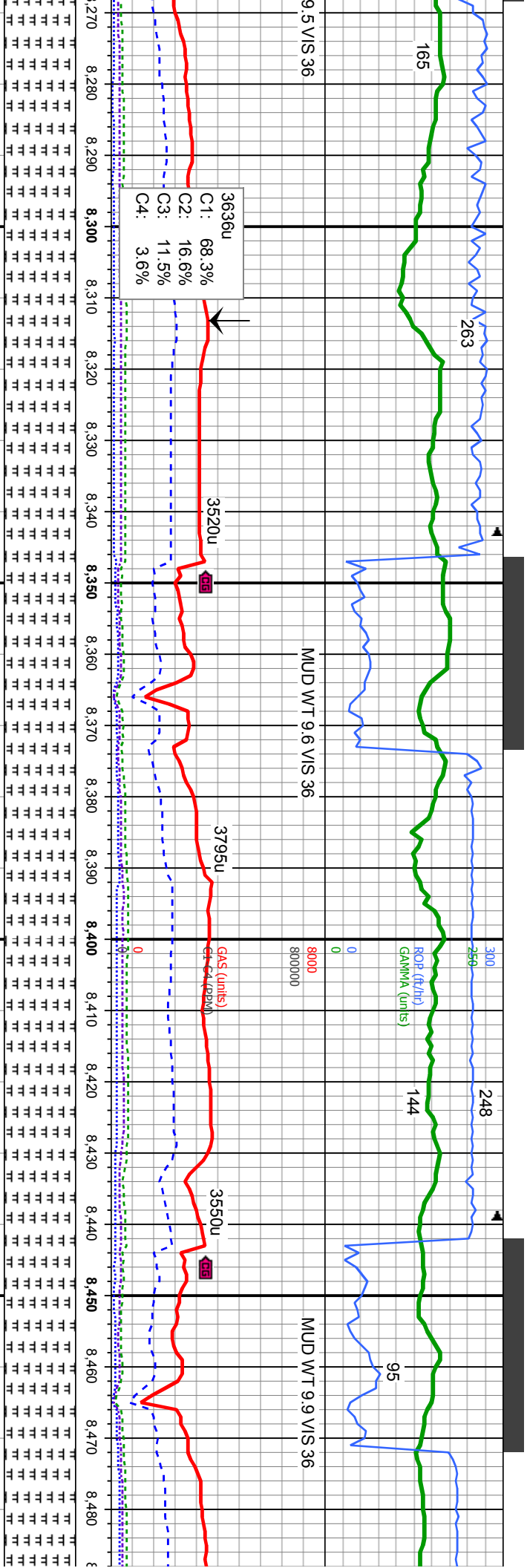
- gy, occ lt brn, mod sft - sft, sb bkly - sb plty, wxy - rthy sm pyr, tr bent dkgy, mod sft-sl firm,		100% CHK: lt gy -dk-gy, occ lt brn, mod sft - sft, occ mod firm, sb bkly - sb plty, wxy - rthy tex, v calc, tr dism pyr	60% CHK: lt gy - gy, occ lt brn, mod sft - sft, occ mod firm, sb bkly - sb plty, wxy - rthy tex, v calc, tr dism pyr, tr bent 40% MRL: m - dkgy, mod sft-sl firm, sbbkly-sbply	60% MRL: m - dkgy, mod sft-sl firm, sbbkly-sbply, rthy-slty tex, sl mot, occ sl vit lstr, v calc 40% CHK: lt gy - gy, occ lt brn, sft, occ mod firm, sb bkly - sb plty, wxy - rthy tex, v calc	65% MRL: m - dkgy, mod sft-sl firm, sbbkly-sbply, rthy-slty tex, sl mot, lstr, v calc 35% CHK: lt gy - gy, occ lt brn, sft, firm, sb bkly - sb plty, wxy - rthy tex,
TVD (ft)					
MD: 7.237' TVD: 6,661.44' Inclination: 90.83 ° Azimuth: 269.23 ° VS: 1,385.53'					
6700					



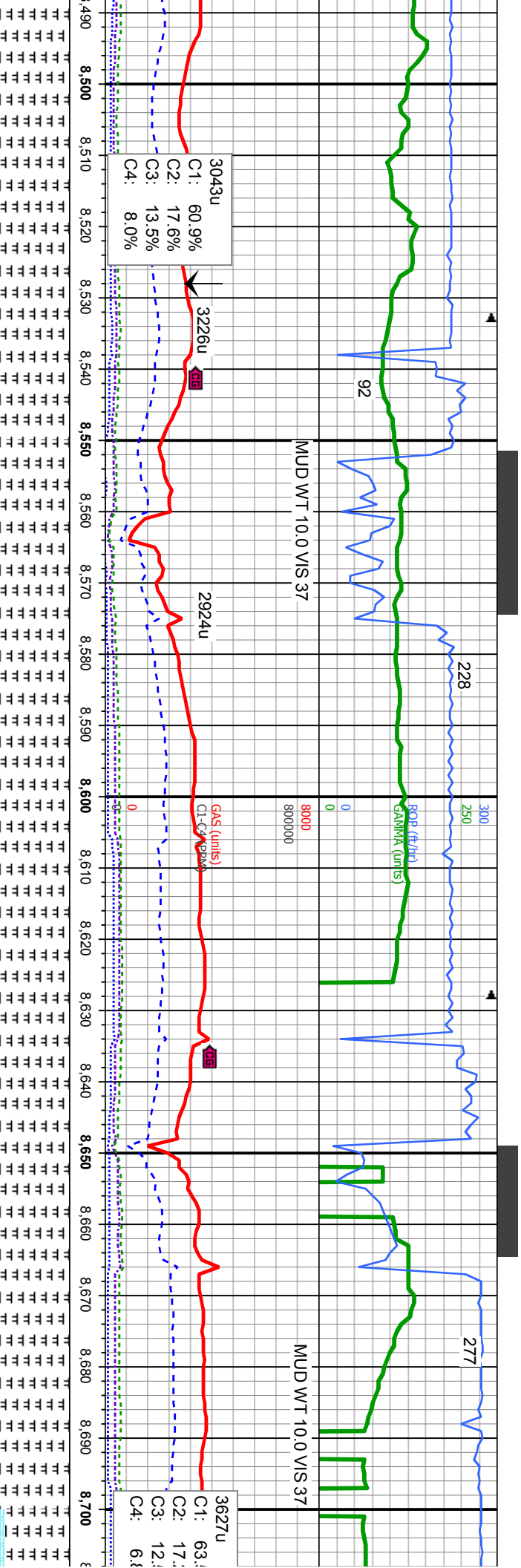
6600	55% MRL: m - dkgy, mod sft-sl firm, sbblky-sbblply, rthy-slty tex, sl mot, occ sl vit	55% MRL: m - dkgy, mod sft-sl firm, sbblky-sbblply, rthy-slty tex, sl mot, occ sl vit	50% MRL: m - dkgy, mod sft-sl firm, sbblky-sbblply, rthy-slty tex, sl mot, occ sl vit	50% MRL: m - dkgy, mod sft-sl firm, sbblky-sbblply, rthy-slty tex, sl mot, occ sl vit
occ mod v calc	Isr, v calc 45% CHK: lt gy - gy, occ lt brn, sft, occ mod firm, sb blky - sb ply, wxy - rthy tex, v calc	Isr, v calc 45% CHK: lt gy - gy, occ lt brn, sft, occ mod firm, sb blky - sb ply, wxy - rthy tex, v calc	sl vit Isr, v calc 50% CHK: lt gy - gy, occ lt brn, sft, occ mod firm, sb blky - sb ply, wxy - rthy tex, v calc	sl vit Isr, v calc 50% CHK: lt gy - gy, occ lt brn, sft, occ mod firm, sb blky - sb ply, wxy - rthy tex, v calc
TVD (ft)				
MD: 7,427' TVD: 6,661.14' Inclination: 90.4 ° Azimuth: 271.68 ° VS: 1,573.51'		MD: 7,522' TVD: 6,662.31' Inclination: 88.18 ° Azimuth: 272.46 ° VS: 1,667.92'		
6700				



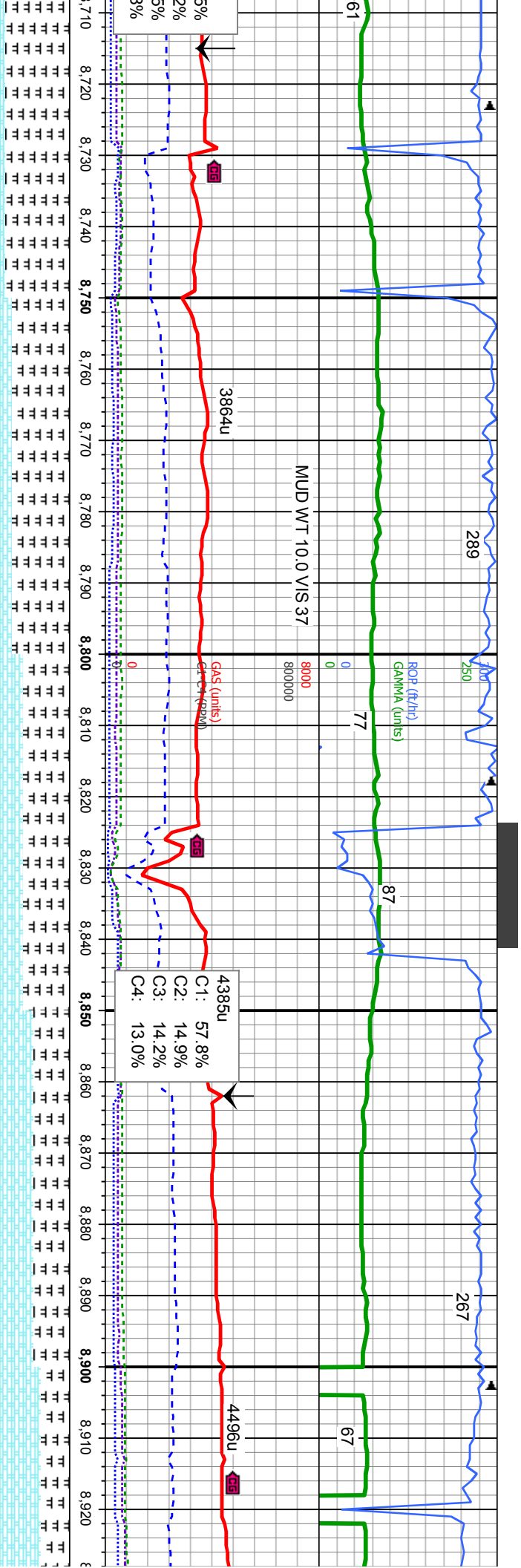
MRL: m - dkgy, mod sft-sl firm, y-sbply, rthy-slty tex, sl mot, occ istr, v calc	60% CHK: lt gy - gy, occ lt brn, sft, occ mod firm, sb blkly - sb ply, wxy - rthy tex, v calc	80% CHK: lt gy - gy, occ lt brn, sft, occ mod firm, sb blkly - sb ply, wxy - rthy tex, v calc	80% CHK: lt gy - gy, occ lt brn, sft, occ mod firm, sb blkly - sb ply, wxy - rthy tex, v calc	6600
CHK: lt gy - gy, occ lt brn, sft, occ firm, sb blkly - sb ply, wxy - rthy tex, v calc	40% MRL: m - dkgy, mod sft-sl firm, sblkly-sbply, rthy-slty tex, sl mot, occ sl vit istr, v calc	20% MRL: m - dkgy, mod sft-sl firm, sblkly-sbply, rthy-slty tex, sl mot, occ sl vit istr, v calc	20% MRL: m - dkgy, mod sft-sl firm, sblkly-sbply, rthy-slty tex, sl mot, occ sl vit istr, v calc	30% MRL: m - dkgy, m sblkly-sbply, rthy-slty sl vit istr, v calc
MD: 7,617'				
TVD: 6,666.23'				
Inclination: 87.1 °				
Azimuth: 273.8 °				
S: 1,762.43'				
6700				



- dkg, mod sft-sl firm, rthy-sltly tex, sl mot, occ	100% MRL: m - dkg, mod sft-sl firm, sbblky-sbblpty, rthy-sltly tex, sl mot, occ sl vit lstr, v calc	100% MRL: m - dkg, mod sft-sl firm, sbblky-sbblpty, rthy-sltly tex, sl mot, occ sl vit lstr, v calc	100% MRL: m - dkg, mod sft-sl firm, sbblky-sbblpty, rthy-sltly tex, sl mot, occ sl vit lstr, v calc
MD: 8,281'		MD: 8,376'	MD: 8,470'
TVD: 6,680.39'		TVD: 6,678.09'	TVD: 6,676.8'
Inclination: 91.51 °		Inclination: 91.26 °	Inclination: 90.31 °
Azimuth: 268.46 °		Azimuth: 270.04 °	Azimuth: 272.16 °
VS: 2,417.98'		VS: 2,511.74'	VS: 2,604.96'
		TVD (ft)	
		6700	



firm, ot, occ	100% MRL: m - dkgy, mod sft-sl firm, sbbiky-sbopity, rthy-sily tex, sl mot, occ sl vit lstr, v calc	100% MRL: m - dkgy, mod sft-sl firm, sbbiky-sbopity, rthy-sily tex, sl mot, occ sl vit lstr, v calc	100% MRL: m - dkgy, mod sft-sl firm, sbbiky-sbopity, rthy-sily tex, sl mot, occ sl vit lstr, v calc	TVD (ft)	6700	90% N sbbiky occ sl 10% C occ fir dism f
Change TVD Scale: 6660-6700						

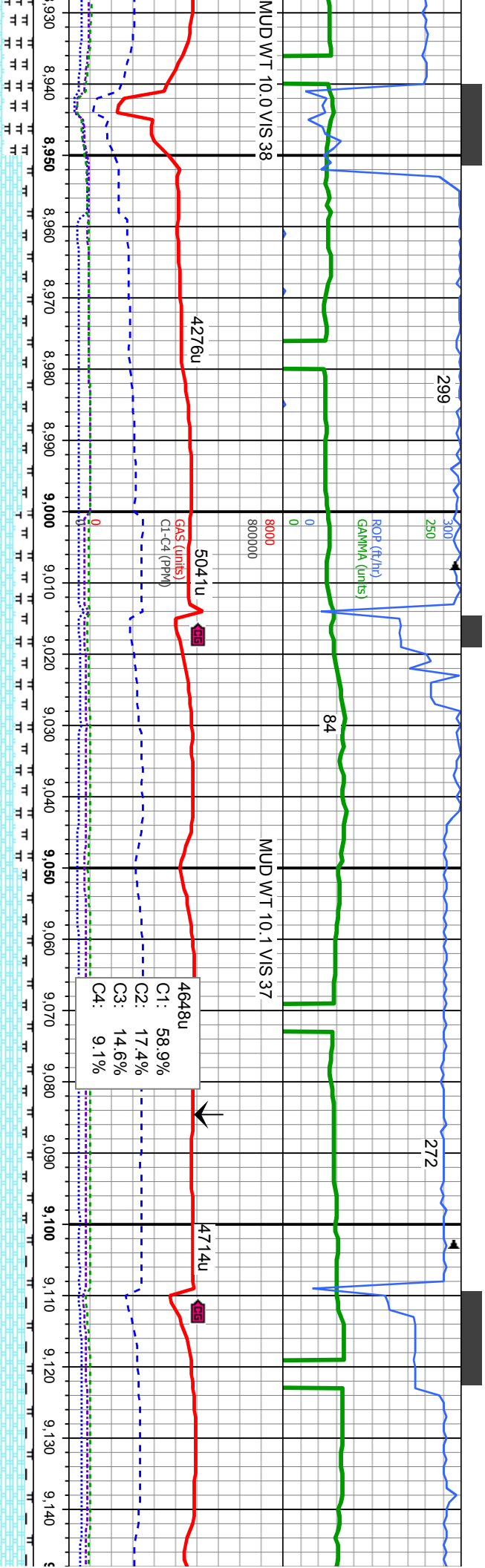


MRIL: m - dkgy, mod sft - sl firm, - sbply, rthy - slty tex, sl mot w/ cly, vit lstr, v calc	80% MRIL: m - dkgy, mod sft - sl firm, sbblky - sbply, rthy - slty tex, sl mot w/ cly, occ sl vit lstr, v calc	65% MRIL: m - dkgy, mod sft - sl firm, sbblky - sbply, rthy - slty tex, occ sl vit lstr, v calc	50% MRIL: m - dkgy, mod sft - sl firm, sbblky - sbply, rthy - slty tex, occ sl vit lstr, v calc	60% CHK: lt gy - gy, occ mod firm, sb blky - s
CHK: lt gy - gy, occ lt brn, mod sft - sft, m, blky - sbblky, wxy - rthy tex, v calc, tr	20% CHK: lt gy - gy, occ lt brn, mod sft - sft, occ firm, blky - sbblky, wxy - rthy tex, v calc, tr	35% CHK: lt gy - gy, occ lt brn, mod sft - sft, occ firm, blky - sbblky, wxy - rthy tex, v calc, calc,	50% CHK: lt gy - gy, occ lt brn, mod sft - sft, occ firm, blky - sbblky, wxy - rthy tex, v calc,	40% MRIL: m - dkgy, mod sft - sft, sbblky - sbply, rthy - slty t
yr, tr bent	tr dism pyr, tr bent			vit lstr, v calc

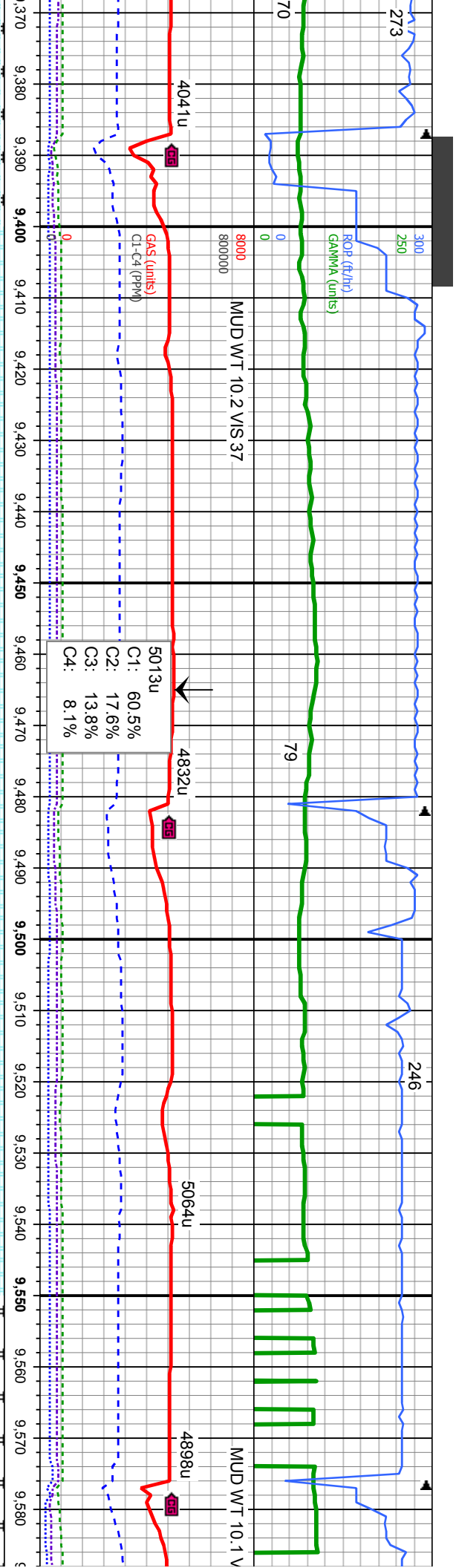
MD: 8,755'
TVD: 6,683.81'
Inclination: 86.95 °
Azimuth: 269.39 °
VS: 2,887.52'

TVD (ft)
MD: 8,850'
TVD: 6,686.29'
Inclination: 90.06 °
Azimuth: 269.8 °
VS: 2,981.36'

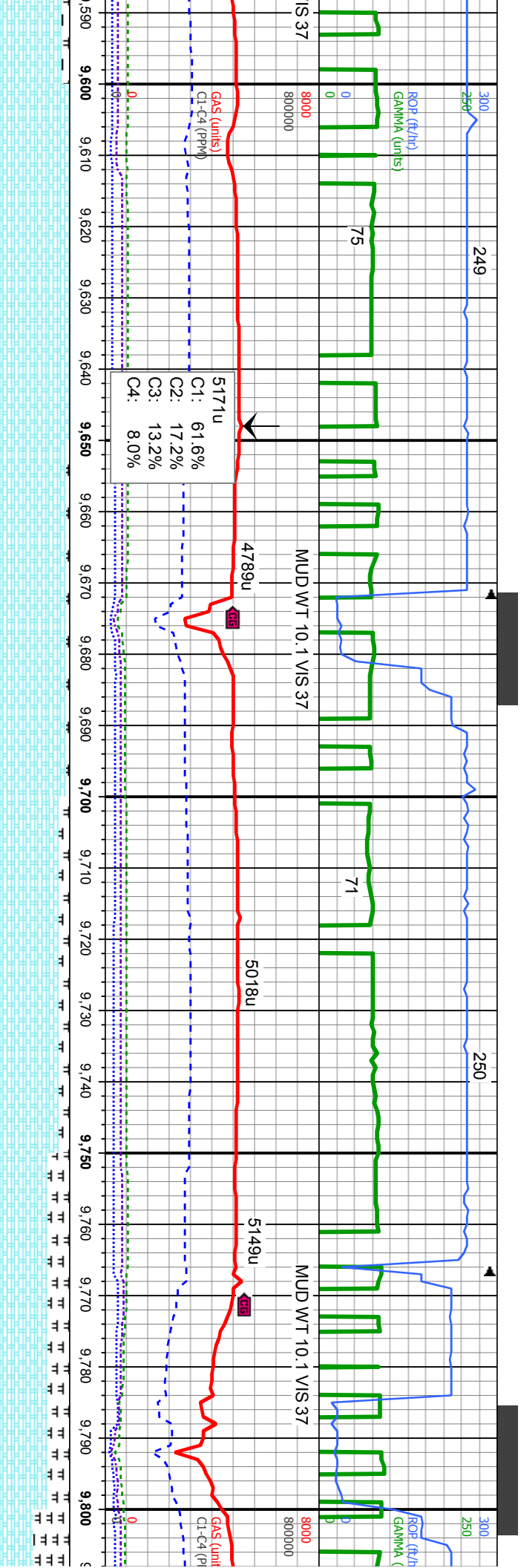
6700



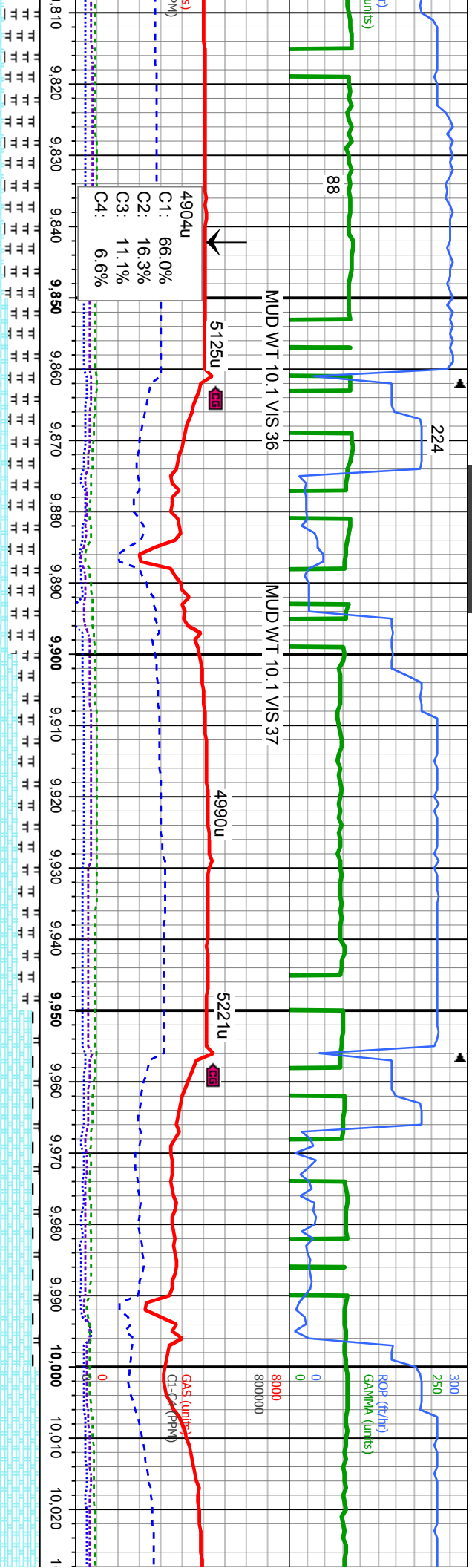
It brn, mod sft - sft, o pfty, wxy - rthy	85% CHK: It gy - gy, occ It brn, mod sft - sft, occ mod firm, sb blkly - sb pfty, wxy - rthy tex, v calc	75% CHK: It gy - gy, occ It brn, mod sft - sft, occ mod firm, sb blkly - sb pfty, wxy - rthy tex, v calc	85% CHK: It gy - gy, occ It brn, mod sft - sft, sft, occ mod firm, sb blkly - sb pfty, wxy - rthy tex, v calc	90% CHK: It gy - gy, occ It brn, mod sft - sft, occ mod firm, sb blkly - sb pfty, wxy - rthy tex v calc
d sft-sl firm, ex, sl mot , occ sl	15% MRL: m - dkgy, mod sft-sl firm, sbbkly-sbopfty, rthy-sfty tex, sl mot , occ sl vit lstr, v calc	25% MRL: m - dkgy, mod sft-sl firm, sbbkly-sbopfty, rthy-sfty tex, sl mot , occ sl vit lstr, v calc	15% MRL: m - dkgy, mod sft-sl firm, sbbkly-sbopfty, rthy-sfty tex, sl mot , occ sl vit lstr, v calc	10% MRL: m - dkgy, mod sft-sl firm, sbbkly-sbopfty, rthy-sfty tex, sl mot , occ sl vit lstr, v calc
MD: 8,945' TVD: 6,687.95' Inclination: 87.94 ° Azimuth: 268.74 ° VS: 3,075.13'			MD: 9,040' TVD: 6,691.19' Inclination: 88.15 ° Azimuth: 268.52 ° VS: 3,168.7'	MD: 9,134' TVD: 6,692.1' Inclination: 90.74 ° Azimuth: 269.33 ° VS: 3,261.41'
		TVD (ft) 6700		



- gy, occ lt brn, mod sft - sft, b bkly - sb plty, wxy - rthy	100% CHK: lt gy - gy, occ lt brn, mod sft - sft, occ mod firm, sb bkly - sb plty, wxy - rthy tex, v calc	100% CHK: lt gy - gy, occ lt brn, mod sft - sft, occ mod firm, sb bkly - sb plty, wxy - rthy tex, v calc	100% CHK: lt gy - gy, occ lt brn, mod sft - sft, occ mod firm, sb bkly - sb plty, wxy - rthy tex, v calc	90% CHK: lt gy - gy, occ lt brn, mod sft - sft, occ mod firm, sb bkly - sb plty, wxy - rthy tex, v calc
dkgy, mod sft-sl firm, rthy-slty tex, sl mot, occ sl				10% MRL: m - dkgy, mod sft-sl firm, sbbkly-sbplty, rthy-slty tex, sl mot, vit lstr, v calc
	<div>MD: 9,419' TVD: 6,694.96' Inclination: 88.33 ° Azimuth: 268.66 ° VS: 3,542.63'</div>		<div>MD: 9,514' TVD: 6,696.96' Inclination: 89.26 ° Azimuth: 268.56 ° VS: 3,636.23'</div>	
	6700			



d sft - sft, rthy tex, m, , occ sl		6100% CHK: lt gy - gy, occ lt bm, mod sft - sft, sft, occ mod firm, sb blkly - sb plty, wxy - rthy tex, v calc	95% CHK: lt gy - gy, occ lt bm, mod sft - sft, occ mod firm, sb blkly - sb plty, wxy - rthy tex, v calc	85% CHK: lt gy - gy, occ lt bm, mod sft - sft, occ mod firm, sb blkly - sb plty, wxy - rthy tex, v calc	70% CHK: lt gy - gy, occ lt bm, mod sft - sft, occ mod firm, sb blkly - sb plty, wxy - rthy tex, v calc, tr dism pyr, tr bent	150% C
MD: 9,609'						
TVD: 6,697.57'						
Inclination: 90 °						
Azimuth: 268.45 °						
VS: 3,729.81'						
TVD (ft)						
6700						
MD: 9,704'						
TVD: 6,697.88'						
Inclination: 89.63 °						
Azimuth: 267.46 °						
VS: 3,823.24'						
TVD (ft)						
6700						
MD: 9,799'						
TVD: 6,698.42'						
Inclination: 89.72 °						
Azimuth: 267.43 °						
VS: 3,916.5'						
TVD (ft)						
6700						



CHK: lt gy - gy, occ lt brn, mod sft - sft, mod firm, sb blkly - sb plty, wxy - rthy tex, sbblkly-sbplty, rthy-slty tex, sl mot, occ sl vit lstr, v calc	55% CHK: lt gy - gy, occ lt brn, mod sft - sft, occ mod firm, sb blkly - sb plty, wxy - rthy tex, v calc	70% CHK: lt gy - gy, occ lt brn, mod sft - sft, occ mod firm, sb blkly - sb plty, wxy - rthy tex, v calc, tr disp pyr, tr bent	90% CHK: lt gy - gy, occ lt brn, mod sft - sft, occ mod firm, sb blkly - sb plty, wxy - rthy tex, v calc	6660
MRL: m - dkgy, mod sft-sl firm, sbblkly-sbplty, rthy-slty tex, sl mot, occ sl vit lstr, v calc	45% MRL: m - dkgy, mod sft-sl firm, sbblkly-sbplty, rthy-slty tex, sl mot, occ sl vit lstr, v calc	30% MRL: m - dkgy, mod sft-sl firm, sbblkly-sbplty, rthy-slty tex, sl mot, occ sl vit lstr, v calc	10% MRL: m - dkgy, mod sft-sl firm, sbblkly-sbplty, rthy-slty tex, sl mot, occ sl vit lstr, v calc	100% CHK: lt gy - gy, occ mod firm, sb blkly tex, v calc
MD: 9,894' TVD: 6,698.73' Inclination: 89.91 ° Azimuth: 268.25 ° VS: 4,009.89'				TVD (ft)
MD: 9,989' TVD: 6,699.82' Inclination: 88.77 ° Azimuth: 268.92 ° VS: 4,103.49'				6700

