

# COLUMBINE LOGGING

Scale: 5" / 100'  
Measured Depth Log

**Well Name** Wells Ranch AE19-636 HORZ

**Location** NWSW 20 6N 62W 6 PM

**State** COLORADO

**County** WELD

**Country** UNITED STATES

**Rig Number** H&P 330

**API Number** 05-123-39640

**Field** WATTENBERG

**Region** DJ BASIN

**Drilling Completed** 1/6/2015

**Spud Date** 12/29/2014

**Surface Coordinates** NWSW 20 6N 62W 6 PM

1648 FSL 65 FWL

Lat/Long: 40.46948/-104.35586

**Bottom Hole Coordinates** Planned Sec: 24 Twp: 6N 63W  
1700 FFSL 235 FFELL

**Ground Elevation** 4,786'

**K.B. Elevation** 4,816'

**Logged Interval** 2000' To 11772'

**Total Depth** 11772'

**Formation** NIOBRARA

**Type of Drilling Fluid** WATER BASED MUD

## Operator

**Company** NOBLE ENERGY INC.

**Address** 1625 Broadway Suite 2200  
Denver, CO 80202

## Geologist

**Name** Teresa Malesardi

**Company** Noble Energy Inc.

**Address** 1625 Broadway Suite 2200  
Denver, CO 80202

tmalesardi@nobleenergyinc.com

## Other

**Well Site Logging Company** Columbine Logging Inc.

**Well Site Geologist (Days)** Brad Wilson

**Well Site Geologist (Nights)** Brendan J. Pfeiffer

## Zone Color Coding

Oil  
Note  
Error

Condensate  
Core  
Water

Gas  
Pressu  
Seal

Rock Types

UNKNOWN	COAL	MARLSTONE	SHALY SANDSTONE
ANHYDRITE	CONGLOMERATE	METAMORPHIC	SHALY SILTSTONE
BENTONITE	DOLomite	NO SAMPLE	SILTY SHALE
BRECCIA	DOLOMITIC LIMESTONE	SALT	SILTSTONE
CHALK	GRANITE	SANDSTONE	TILL
CEMENT	GYPSUM	SALT-PEPPER SANC	TUFF
CHERT	IGNEOUS	SHALE	WELDED TUFF
CLAY CHOKE SANC	SIDERITE or LIMONITE	SHALE COLORED	
CLAYSTONE	LIMESTONE	SHALE GRAY	

Accessories

GASTROPOD	ARGILLITE GRAIN	HEAVY MINERAL	
INOCERAMUS	BENTONITE	KAOLIN	
ALGAE	BITUMENOUS SUBSTANCE	MARGASITE	ANHYDRITE STRINGER
AMPHIPORA	BRECCIA FRAGMENTS	MARLSTONE	BENTONITE STRINGER
BELEMNITE	PELECYPOD	MICACEOUS	COAL STRINGER
BIOCLASTIC	PELLET	CARBONACEOUS FLAKES	DOLomite STRINGER
BRACHIOPOD	PISOLITE	CHTDK	GYPSUM STRINGER
BRYOZOA	PLANT REMAINS	CHTLT	LIMESTONE STRINGER
CEPHALOPOD	PLANT SPORES	COAL - THIN BEDS	MARLSTONE (CALC) STRG
CORAL	SCAPHOPOD	DOLOMITIC	MARLSTONE (DOL) STRG
CRINOID	STROMATOPOROID	FELDSPAR	SANDSTONE STRINGER
ECHINOID		FERRUGINOUS PELLET	SHALE STRINGER
FISH		FERRUGINOUS	SILICEOUS
FORAMINIFERA	ANHYDRITIC	GLAUCONITE	SILTY
FOSSIL	ARGILLACEOUS	GYPSIFEROUS	TUFFACEOUS

Minerals

Stringer

Oil Show

PINPOINT
VUGGY

Engineering

DEAD	
EVEN	
QUESTIONABLE	BIT
SPOTTED STAINING	CONNECTION (UP)

Porosity

CONNECTION (DOWN)	CONNECTION GAS
EARTHY	CONNECTION GAS
FENESTRAL	TRIP GAS
FRACTURE	TRIP GAS (LEFT)
INTERCRYSTALLINE	DOWN TIME GAS
INTEROOLITIC	DOWN TIME GAS (L)
MOLDIC	CORE - LOST
ORGANIC	CORE - RECOVERED

# Other Symbols

 DST INTERVAL       WIRELINE TESTED - LEFT   **E** EARTHY

 FAULT       WIRELINE TESTED - RT    **FX** FINELYXLN

 FORMATION TOP       DRILL STEM TEST      **GS** GRAINSTONE

 GAS SHOW       **MINDEPTH** MN DEPTH      **L** LITHOGRAPHIC


 OIL SHOW      **MX** MICROXLN


 **MINDEPTH** MN DEPTH UP      **MS** MUDSTONE

## Rounding

 **MINDEPTH** MN DEPTH (DOWN)      **A** ANGULAR      **PS** PACKSTONE

 NORMAL FAULT      **R** ROUNDED      **WS** WACKSTONE

 **(LEFT)** OVERTURNED STRATA      **B** SUBANG


 REVERSE FAULT      **R** SUBRND

## Sorting

 CASING      **M** MODERATE

## Textures

 SIDEWALL CORE (LEFT)      **P** POOR

 **(LEFT)** SIDEWALL CORE (RIGHT) **BS** BOUNDSTONE      **W** WELL

 SLIDE      **C** CHALKY

 **DST** SURVEY      **CX** CRYPTOXLN

Slide/Rotate

COLUMBINE LOGGING RIGGED UP  
ON 12/29/14 MANNED 2-PERSON

ROP

ROP

GAMMA

MUDLOG CONTINUED FROM  
"Wells Ranch AE19-636.mplot"

ROP (ft/hr)

ROP (ft/hr)

MUD WT 9.9 VIS 38

118api

91api

ROP (ft/hr)

GAMMA (api)

118api

ROP DATA IMPORTED  
FROM PASON EDR

GAS

C1

C2

C3

C4

GAS DATA FROM BLOODHOUND  
CHROMATOGRAPH UNIT #273  
JOB NUMBER 160 via IBALL GAS  
CHART DATA BASE  
"AE19\_636.mdb"

GAS (units)

1831.19u

C1: 72.3%

C2: 11.1%

C3: 11%

C4: 5.6%

GAS (units)

1827u

1568u

Depth Labels

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 6,140 6,150

% Lith

SURVEY AND GAMMA DATA  
PROVIDED BY PATHFINDER  
ENERGY SERVICES

MD: 6.003'  
TVD: 5.984.45'  
Inclination: 26.2°  
Azimuth: 267.94°  
VS: 185.52'

MD: 6.097'  
TVD: 6.065.74'  
Inclination: 33.94°  
Azimuth: 264.78°  
VS: 232.51'

Well Bore  
TVD

TVD (ft)

TVD (ft)

SLTY SH: med - dk gy, sb pily-pily, sft- sl frm, sit  
tex, sl rthy lstf, sl sdy lp, non calc  
SHY SS: lgy - occ offwhl, sft - brit occ frm, sb  
rnd, f-v f gr, mod srt, arg cnt, tr wh ss, no bent

SLTY SH: med - dk gy, sb pily-pily, sft- sl frm, sit  
tex, sl rthy lstf, sl sdy lp, non calc  
SHY SS: lgy - occ offwhl, sft - brit occ frm, sb  
rnd, f-v f gr, mod srt, arg cnt, tr wh ss, no bent

SLTY SH: med - dk gy, sb pily-pily, sft- sl frm, sit  
tex, sl rthy lstf, sl sdy lp, non calc  
SHY SS: lgy - occ offwhl, sft - brit occ frm, sb  
rnd, f-v f gr, mod srt, arg cnt, tr wh ss, r bent

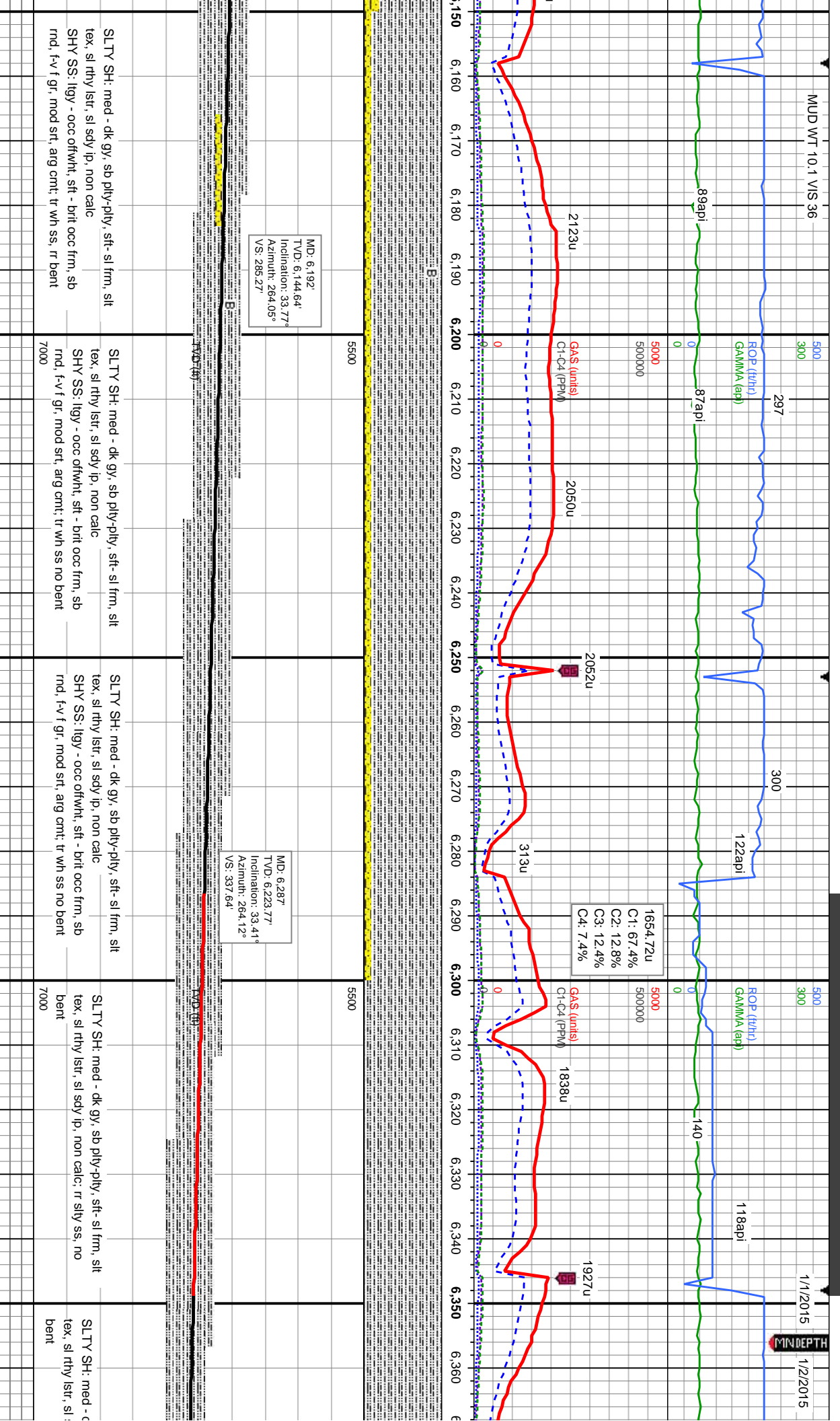
Oil Show

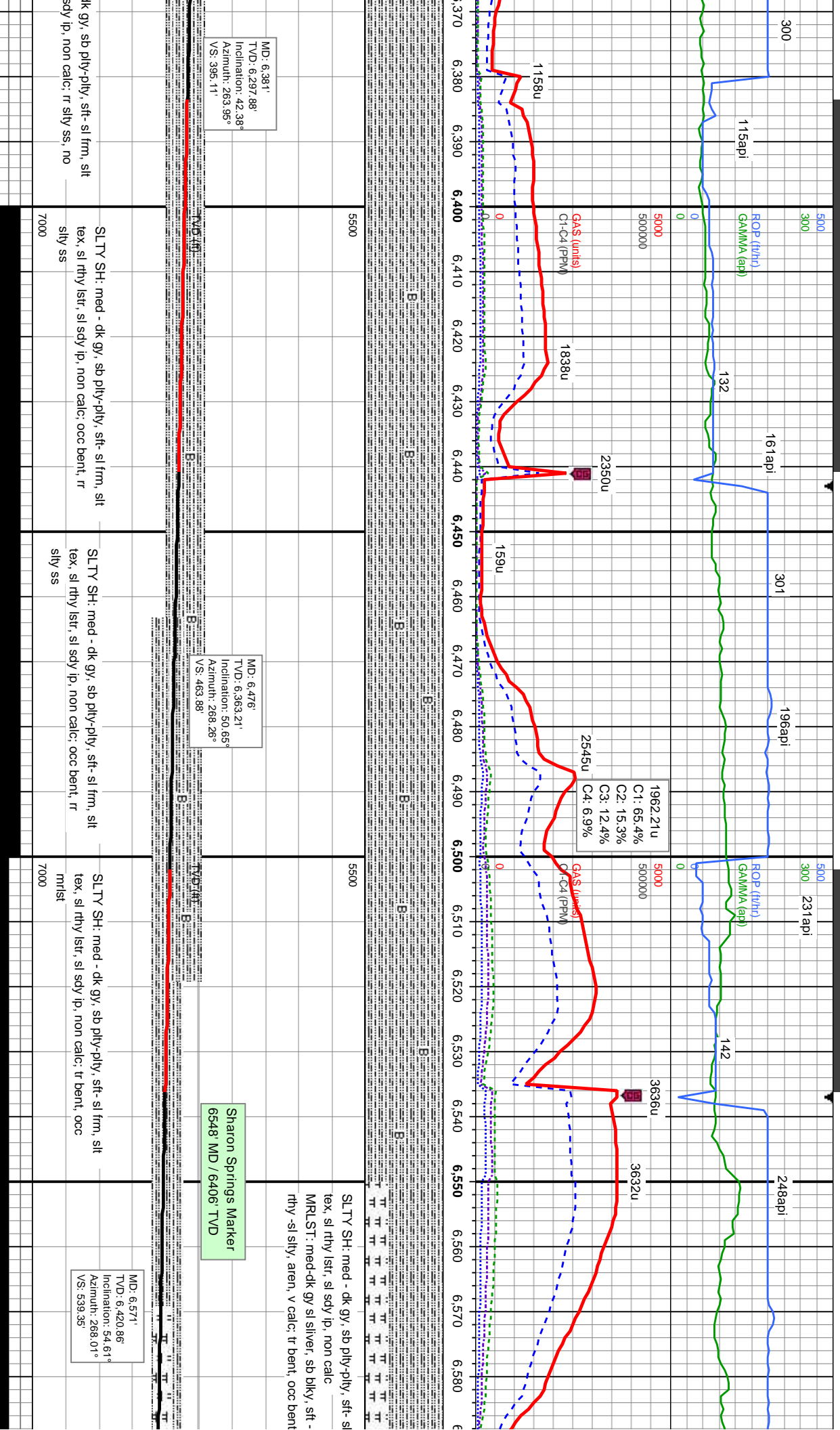
E  
G  
M  
F  
T  
ST

Images



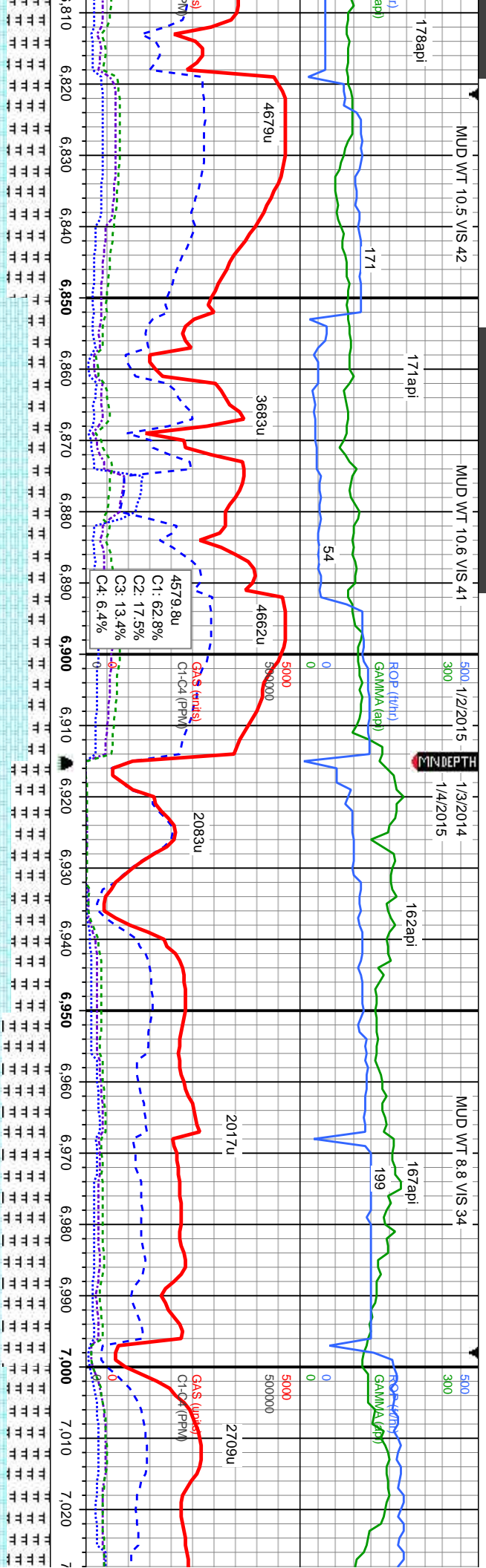












CHK: lt gy occ med gy-gy brn, sb blk, sl sft, v  
mot, sl wxy, occ sl sily, v calc  
MRLST: med-dk gy sl silver, sb blk, sft - sl  
frm, rthy -sl sily, aren; tr bent  
CHK: lt gy wi tr spc wh occ med gy-gy brn, sb blk, sl sft, v mot, sl wxy, occ sl sily, v calc

B Chalk  
6838' MD / 6632' TVD

TD Build Section and TOO  
For 7" Casing @ 6915' MD  
8:30am MST 1-2-2015  
Resumed Drilling Lateral 6:30am 1/4/2015

MD: 6,936'  
TVD: 6,541.28'  
Inclination: 87.23°  
Azimuth: 275.11°  
VS: 876.53'

SCALE CHANGE  
TVD 6500'-6600'

MD: 7,000'  
TVD: 6,500'  
Inclination: 87.23°  
Azimuth: 275.11°  
VS: 967'

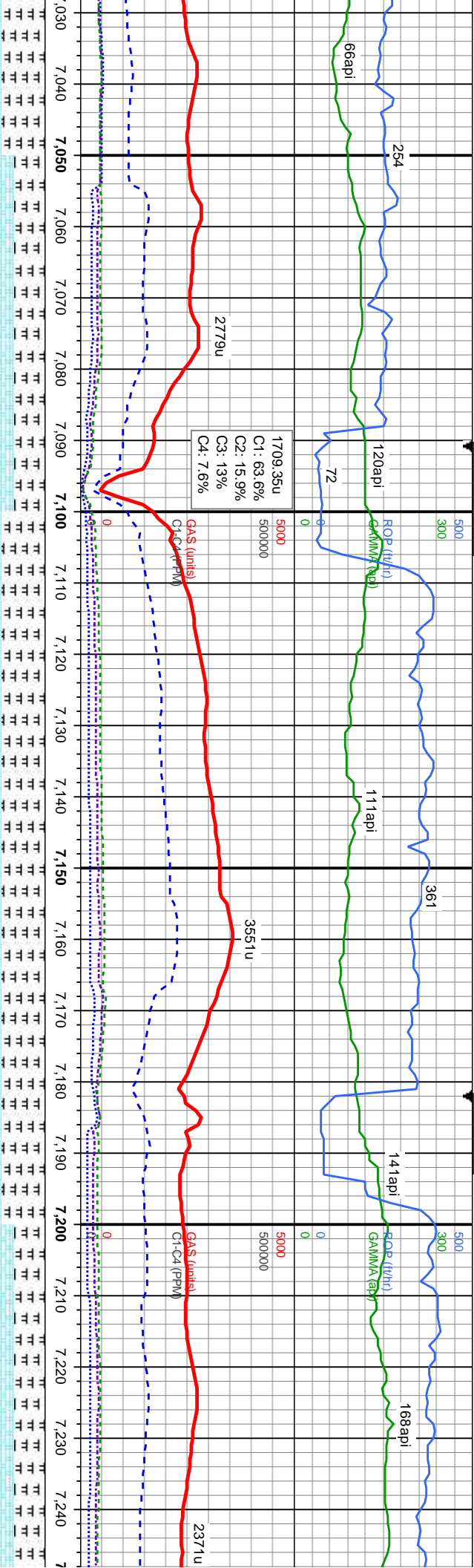
MD: 6,855'  
TVD: 6,533.71'  
Inclination: 82.04°  
Azimuth: 273.61°  
VS: 796.28'

7000

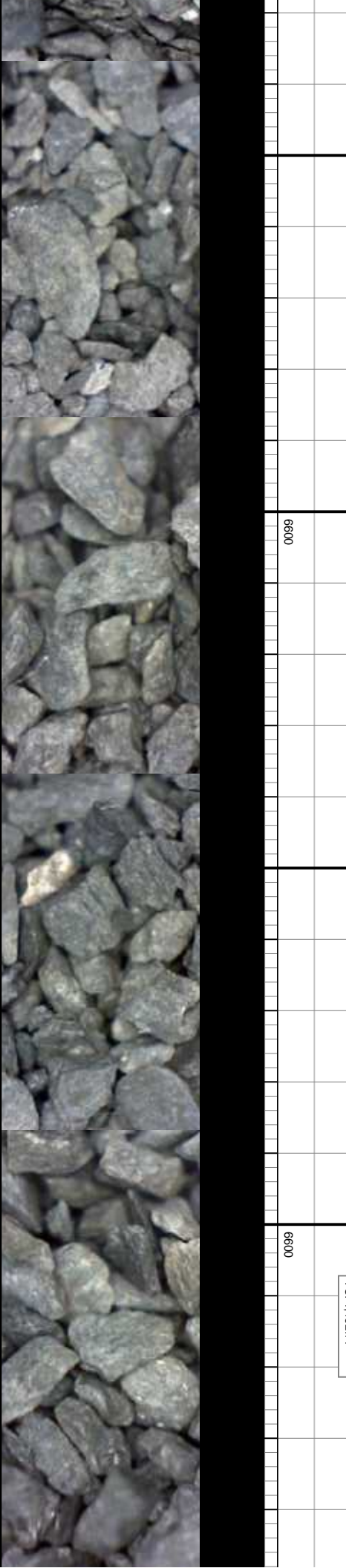
6600

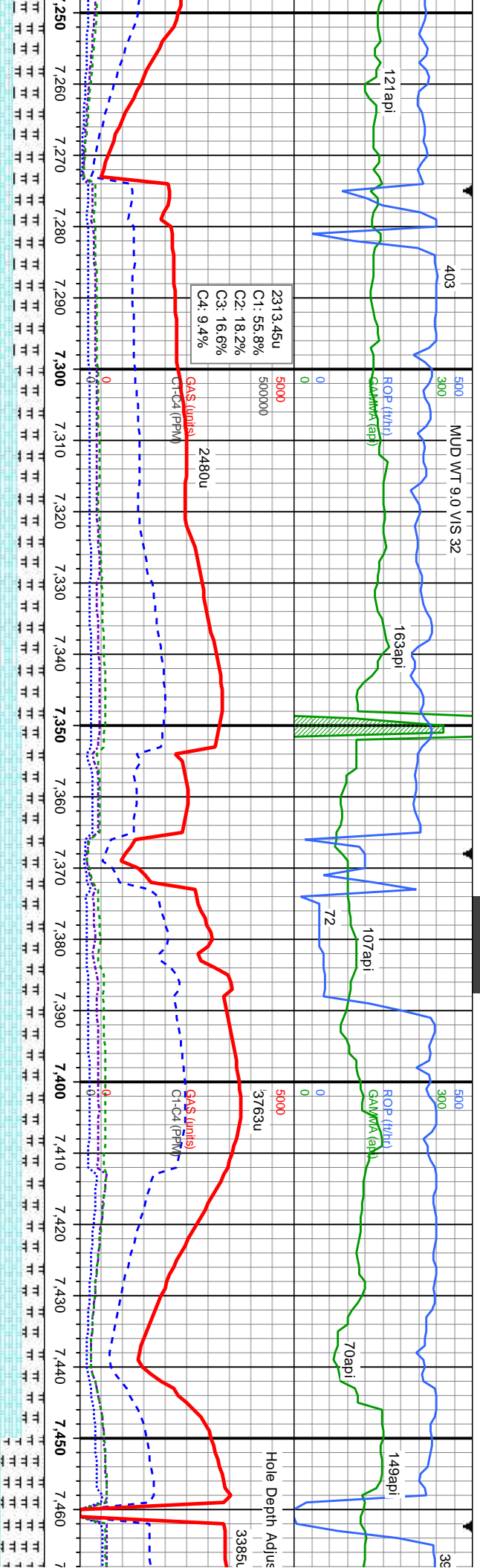






med gy-gy brn, sb blk, sl sft, mot, sl	CHK: med gy-gy brn, sb blk, sl sft, mot, sl	MD: 7.120' TVD: 6,549.18' Inclination: 87.58° Azimuth: 270.27° VS: 1,059.84
med gy-gy brn, sb blk, sl sft, mot, sl	CHK: med gy-gy brn, sb blk, sl sft, mot, sl	MD: 7.213' TVD: 6,552.54' Inclination: 88.29° Azimuth: 268.66° VS: 1,162.77





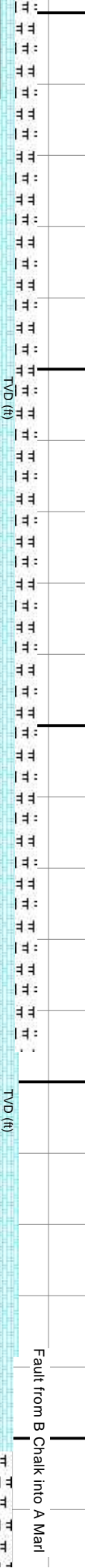
CHK: med gy-gy brn, sb blky, sl sft, mot, sl  
wxy, occ sl sily, v calc  
MRLST: med-dk gy sl silver, sb blky, sft - sl  
frm, rthy, sl aren, tr imbnd inoc foss

6500  
CHK: lt-med gy-lt gy brn, sb blky, sl sft, v mot,  
sl wxy, occ sl sily, v calc  
MRLST: med-dk gy sl silver, sb blky, sft - sl  
frm, rthy, sl aren, v calc

6500  
CHK: lt-med gy-lt gy brn, sb blky, sl sft, v mot,  
sl wxy, occ sl sily, v calc  
MRLST: med-dk gy sl silver, sb blky, sft - sl  
frm, rthy, sl aren, v calc

6500  
CHK: lt-med gy-lt gy brn, sb blky, sl sft, v mot,  
sl wxy, occ sl sily, v calc  
MRLST: med-dk gy, sb blky, sft - sl frm, rthy, sl  
aren, v calc

CHK: lt-med gy-lt  
sl wxy, occ sl sily,  
MRLST: med-dk  
aren, v calc

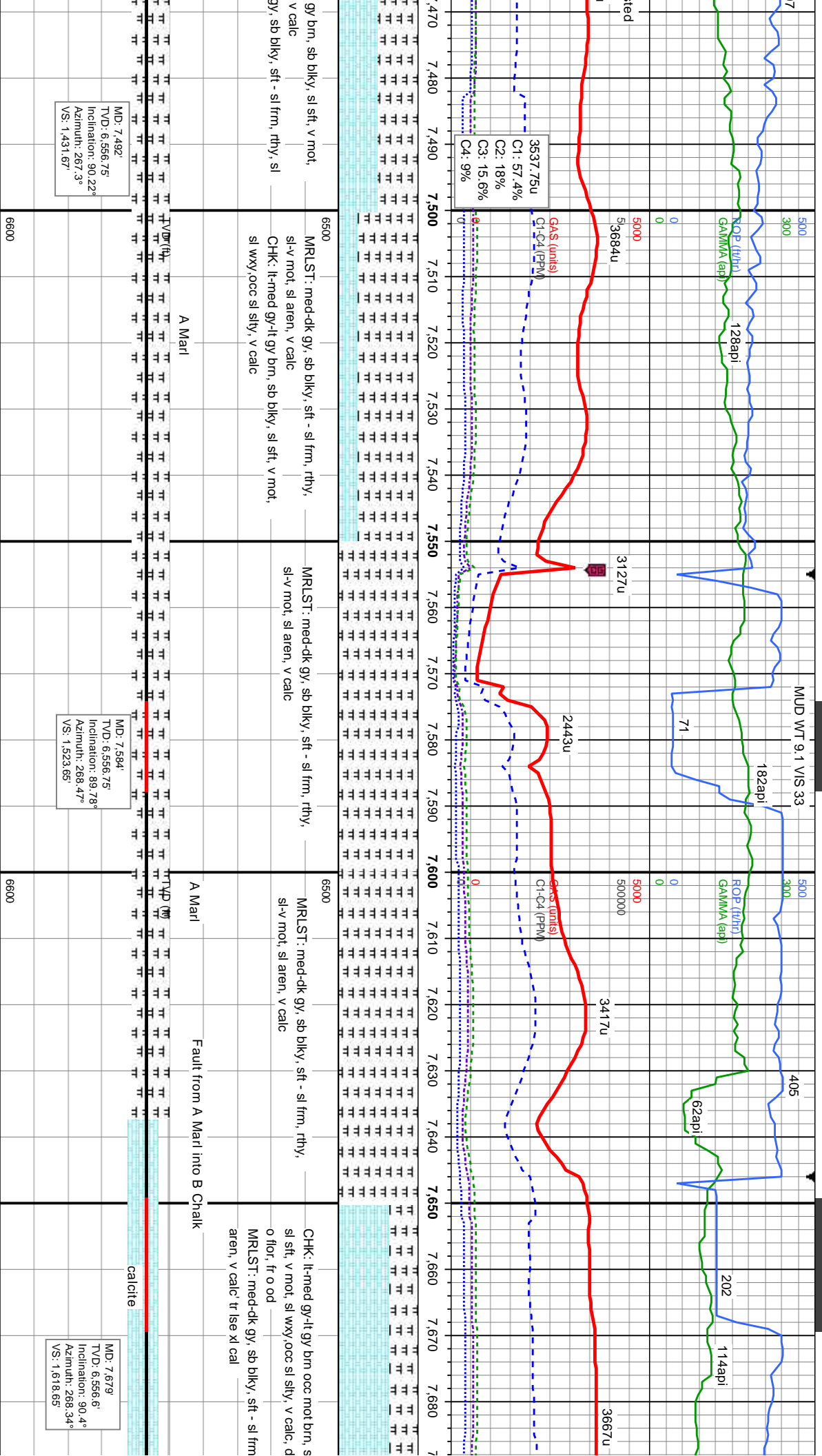


MD: 7.306'  
TVD: 6.554.74'  
Inclination: 88.99°  
Azimuth: 267.16°  
VS: 1.245.73

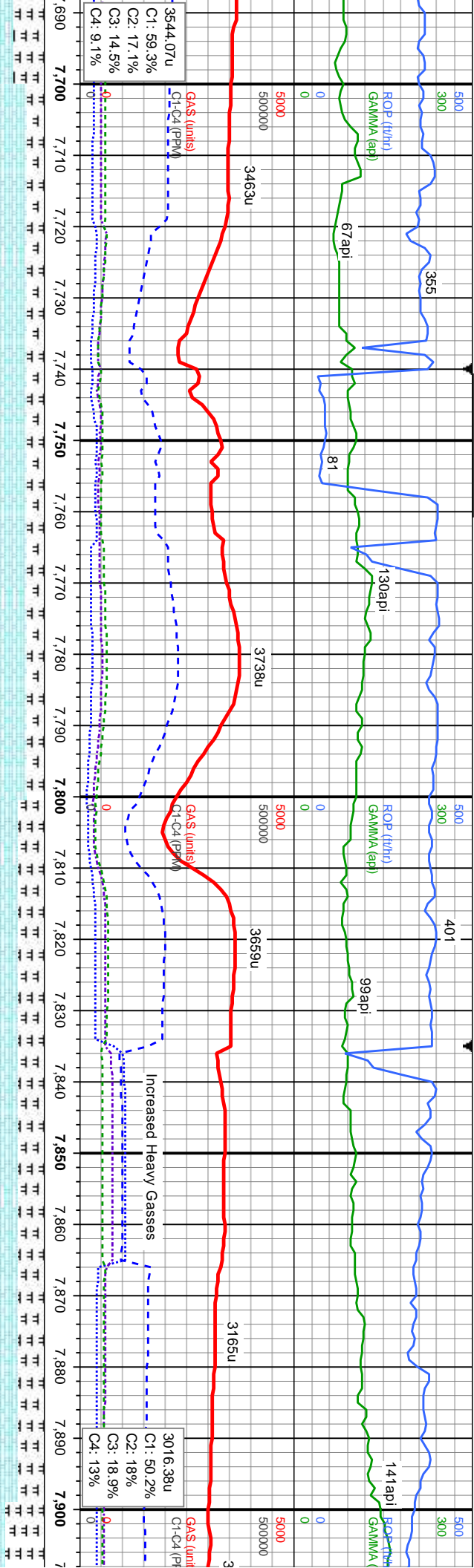
MD: 7.399'  
TVD: 6.556.24'  
Inclination: 89.16°  
Azimuth: 268.25°  
VS: 1.338.69







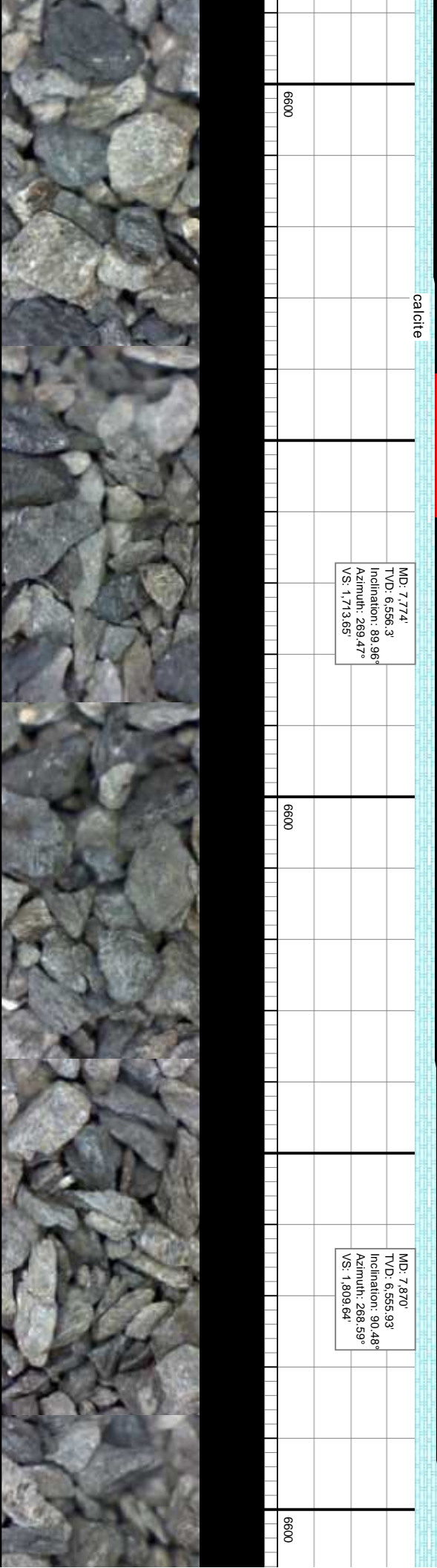




6500	CHK: lt-med gy-lt gy brn occ mot brn, sb blky, sl sft, v mot, sl wxy, occ sl sily, v calc, dim yel o flor, fr o od	CHK: med gy brn-lt gy brn occ mot brn, sb blky, sl sft, v mot, sl wxy, occ sl sily, v calc, dim yel o flor, fr o od	6500	CHK: med gy brn-lt gy brn occ mot brn, sb blky, sl sft, v mot, sl wxy, occ sl sily, v calc	6500	CHK: med gy brn-lt gy brn occ mot brn, sb blky, sl sft, v mot, sl wxy, occ sl sily, v calc	6500	CHK: med gy brn-lt gy brn occ mot brn, sb blky, sl sft, v mot, sl wxy, occ sl sily, v calc
	MRLST: med-dk gy, sb blky, sft - sl frm, rthy, sl aren, v calc			MRLST: med-dk gy, sb blky, sft - sl frm, rthy, sl aren, v calc				MRLST: med-dk gy, sb blky, sft - sl frm, rthy, sl aren, v calc
	TV D (ft)			TV D (ft)				TV D (ft)

MD: 7.774'  
TVD: 6.556.3'  
Inclination: 89.96°  
Azimuth: 269.47°  
VS: 1.713.65'

MD: 7.870'  
TVD: 6.555.93'  
Inclination: 90.48°  
Azimuth: 268.59°  
VS: 1.809.64'



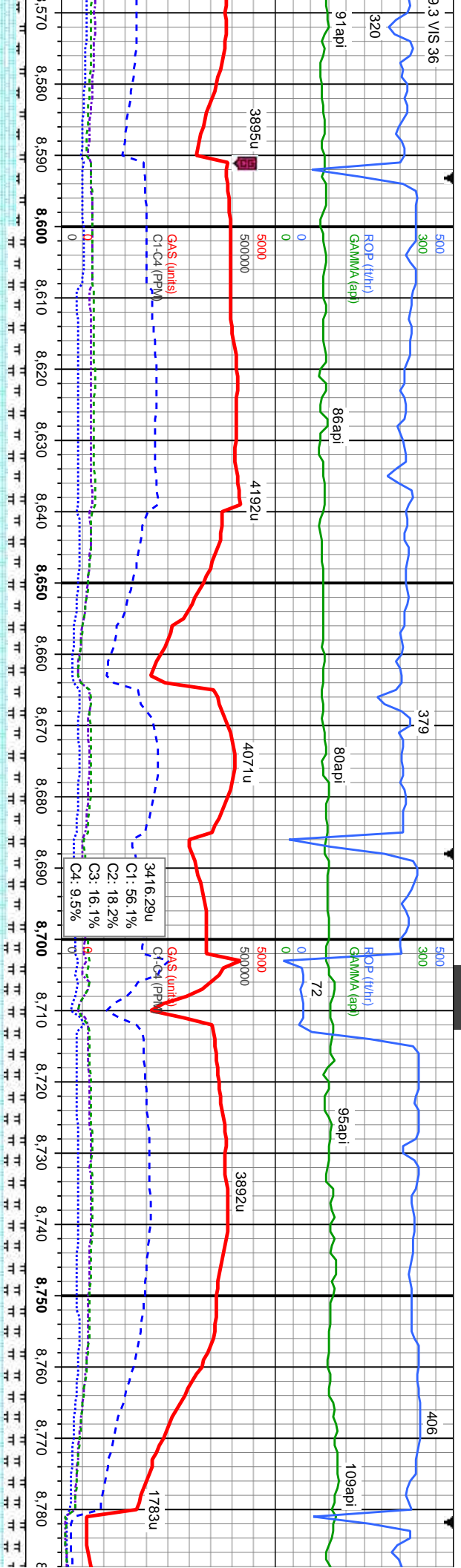












Y brn, sb blkly, sl sft-sl frm, v  
sl slty, v calc  
k gy, sb blkly, sft - sl frm, rthy,  
tr inoc

CHK: lt gy - lt gy brn, sb blkly, sl sft-sl frm, v  
mot, sl wxy, occ sl slty, v calc  
MRLST: med-dk gy, sb blkly, sft - sl frm, rthy,  
sl aren, v calc, tr inoc, tr cal

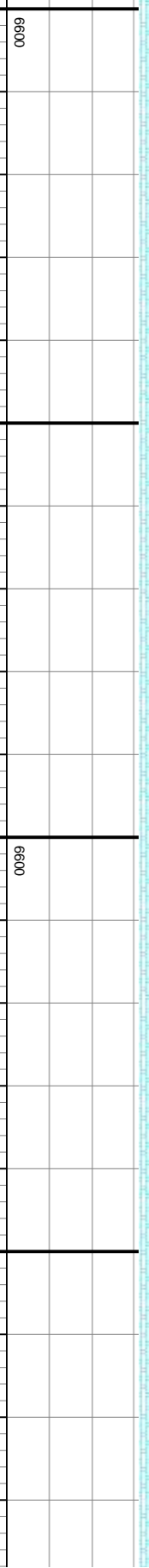
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mot, sl wxy, occ sl slty, v calc  
MRLST: med-dk gy, sb blkly, sft - sl frm, rthy,  
sl aren, v calc, tr inoc, tr cal

CHK: lt gy - lt gy brn, sb blkly, sl sft-sl frm, v  
mot, sl wxy, occ sl slty, v calc  
MRLST: med-dk gy, sb blkly, sft - sl frm, rthy,  
sl aren, v calc, tr inoc, tr bent

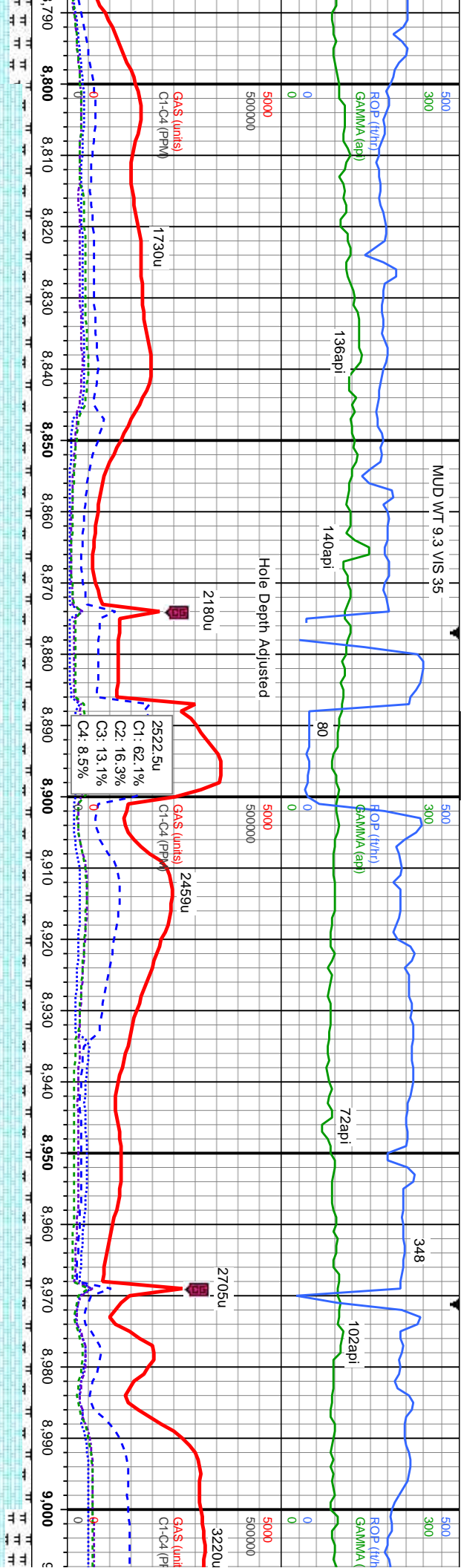
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mot, sl wxy, occ sl slty, v calc  
MRLST: med-dk gy, sb blkly, sft - sl frm, rthy,  
sl aren, v calc, tr inoc, tr bent

MD: 8.626'  
TVD: 6.565.17'  
Inclination: 89.69°  
Azimuth: 266.41°  
VS: 2.565.36

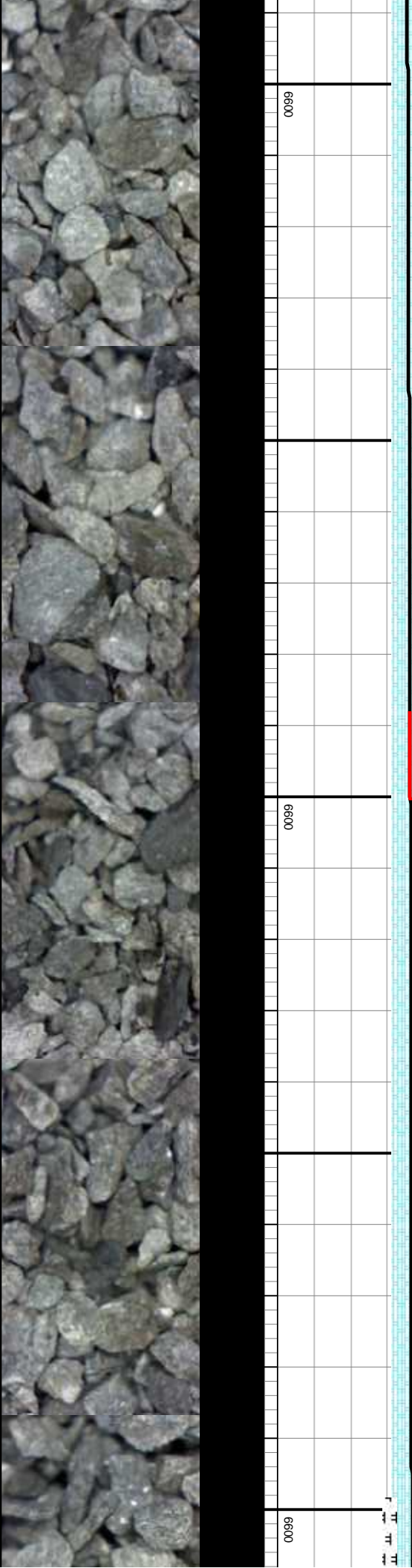
MD: 8.721'  
TVD: 6.565.09'  
Inclination: 90.4°  
Azimuth: 267.11°  
VS: 2.660.29



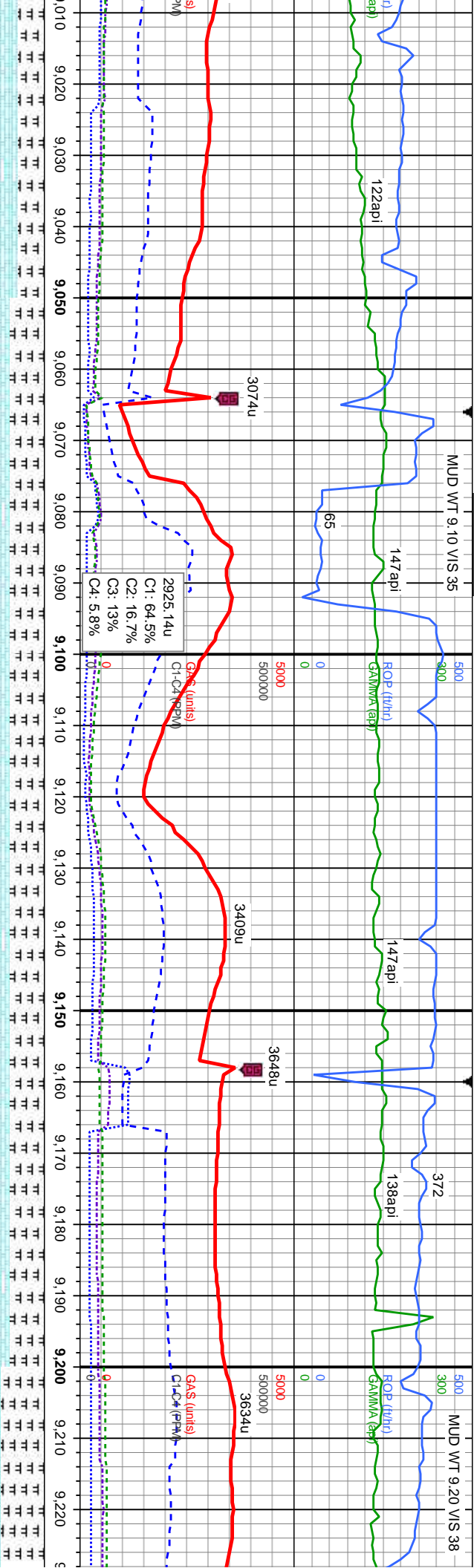




6500	CHK: lt gy - lt gy brn, sb blk, sl sft-sl frm, v mot, sl wxy, occ sl sft, v calc MRLST: med-dk gy, sb blk, sft - sl frm, rthy, sl aren, v calc; tr inoc, tr bent, rr cal	6500	CHK: lt gy - lt gy brn, sb blk, sl sft-sl frm, v mot, sl wxy, occ sl sft, v calc MRLST: med-dk gy, sb blk, sft - sl frm, rthy, sl aren, v calc; tr inoc, tr bent, rr cal	6500	CHK: lt gy - lt gy brn, sb blk, sl sft-sl frm, v mot, sl wxy, occ sl sft, v calc MRLST: med-dk gy, sb blk, sft - sl frm, rthy, sl aren, v calc; tr inoc, tr bent	6500	CHK: lt gy - lt gy brn, sb blk, sl sft-sl frm, v mot, sl wxy, occ sl sft, v calc MRLST: med-dk gy, sb blk, sft - sl frm, rthy, sl aren, v calc; tr inoc, tr bent
TVD: 8.816' Inclination: 90.84° Azimuth: 267.31° VS: 2.755.24'		TVD: 8.910' Inclination: 89.96° Azimuth: 266.66° VS: 2.849.19'		TVD: 9.004' Inclination: 90° Azimuth: 266° VS: 2.943.1'			







CHK: lt gy - lt gy brn, sb blk, sl sft-sl frm, v  
mot, sl wxy, occ sl slty, v calc  
MRLST: med-dk gy, sb blk, sft - sl frm, rthy,  
sl aren, v calc; tr cal

CHK: lt gy - lt gy brn, sb blk, sl sft-sl frm, v  
mot, sl wxy, occ sl slty, v calc  
MRLST: med-dk gy, sb blk, sft - sl frm, rthy,  
sl aren, v calc; occ cal

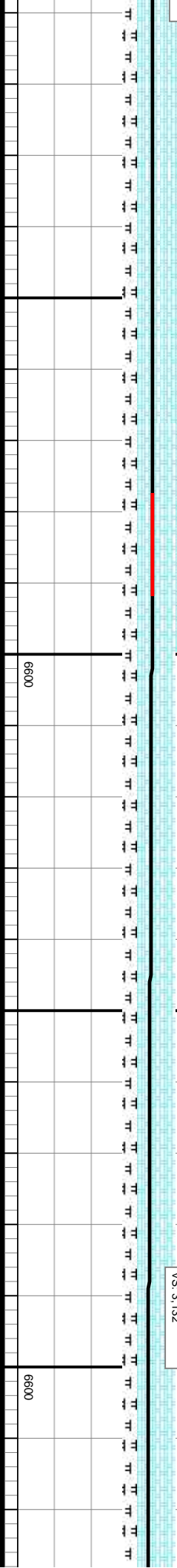
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mot, sl wxy, occ sl slty, v calc  
MRLST: med-dk gy, sb blk, sft - sl frm, rthy,  
sl aren, v calc; occ cal

MRLST: med-dk gy, sb blk  
CHK: lt gy - lt gy brn, sb blk  
mot, sl wxy, occ sl slty, v c

MD: 9.099'  
TVD: 6,563.05'  
Inclination: 89.52°  
Azimuth: 267.87°  
VS: 3,038.04'

MD: 9.193'  
TVD: 6,563.91'  
Inclination: 89.43°  
Azimuth: 266.78°  
VS: 3,132'

TVD (ft)

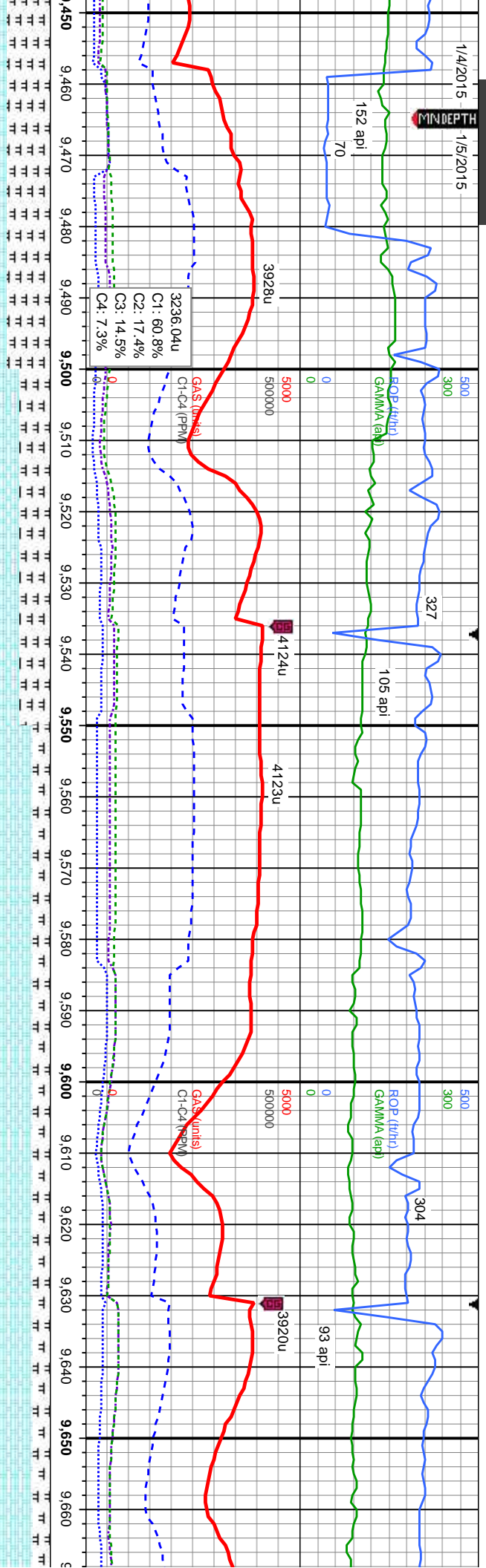






1/4/2015  
1/5/2015

MINDEPTH



MRLST: med-dk gy, sb blkly, sft - sl frm, rthy,  
sl aren, v calc; occ cal  
CHK: lt gy - lt gy brn, sb blkly, sl sft-sl frm, v  
mot, sl wxy, occ sl sily, v calc;  
mot, sl wxy, occ sl sily, v calc; rr inoc, rr cal

MD: 9.476'  
TVD: 6,566.58'  
Inclination: 89.08°  
Azimuth: 269.3°  
VS: 3.414.7

TVD (ft)

6600

CHK: lt gy - lt gy brn, sb blkly, sl sft-sl frm, v  
mot, sl wxy, occ sl sily, v calc  
MRLST: med-dk gy, sb blkly, sft - sl frm, rthy,  
sl aren, v calc; rr inoc

MD: 9.570'  
TVD: 6,567.73'  
Inclination: 89.52°  
Azimuth: 269.66°  
VS: 3.508.69

TVD (ft)

6600

CHK: lt gy - lt gy brn, sb blkly, sl sft-sl frm, v  
mot, sl wxy, occ sl sily, v calc  
MRLST: med-dk gy, sb blkly, sft - sl frm, rthy,  
sl aren, v calc; rr inoc

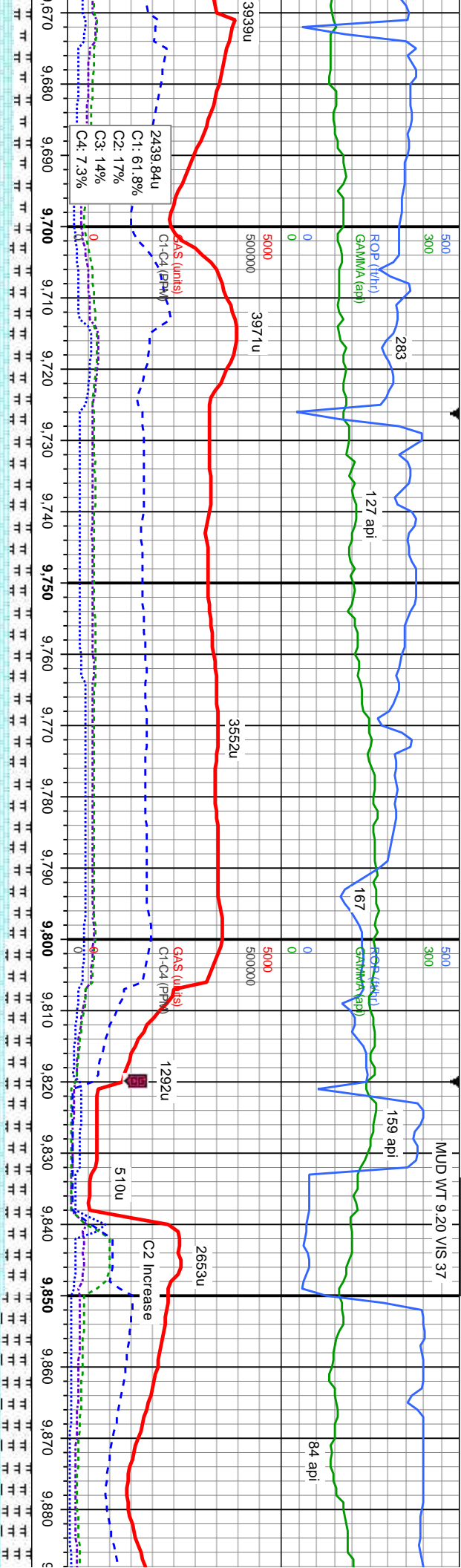
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mot, sl wxy, occ sl sily, v calc  
MRLST: med-dk gy, sb blkly, sft - sl frm, rthy,  
sl aren, v calc; rr cal

MD: 9.665'  
TVD: 6,568.0'  
Inclination: 9°  
Azimuth: 266°  
VS: 3.603.68

CHK: lt gy - lt gy brn, sb blkly, sl sft-sl frm, v  
mot, sl wxy, occ  
MRLST: med-dk gy, sb blkly, sft - sl frm, rthy,  
sl aren, v calc;







gy brn, sb blkly, sl sft-sl frm, v  
c sl sily, v calc  
dk gy, sb blkly, sft - sl frm, rthy,  
rr cal

6500  
CHK: lt gy - lt gy brn, sb blkly, sl sft-sl frm, v  
mot, sl wxy, occ sl sily, v calc  
MRLST: med-dk gy, sb blkly, sft - sl frm, rthy,  
sl aren, v calc; rr inoc

6500  
CHK: lt gy - lt gy brn, sb blkly, sl sft-sl frm, v  
mot, sl wxy, occ sl sily, v calc  
MRLST: med-dk gy, sb blkly, sft - sl frm, rthy,  
sl aren, v calc; rr inoc

6500  
CHK: lt gy - lt gy brn, sb blkly, sl sft-sl frm, v  
wxy, occ sl sily, v calc  
MRLST: med-dk gy, sb blkly, sft - sl frm, r  
aren, v calc

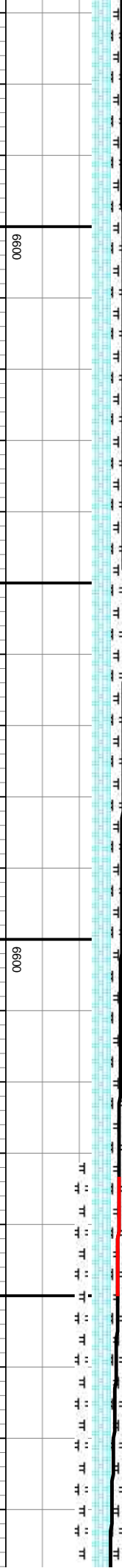
2  
0.13°  
46°

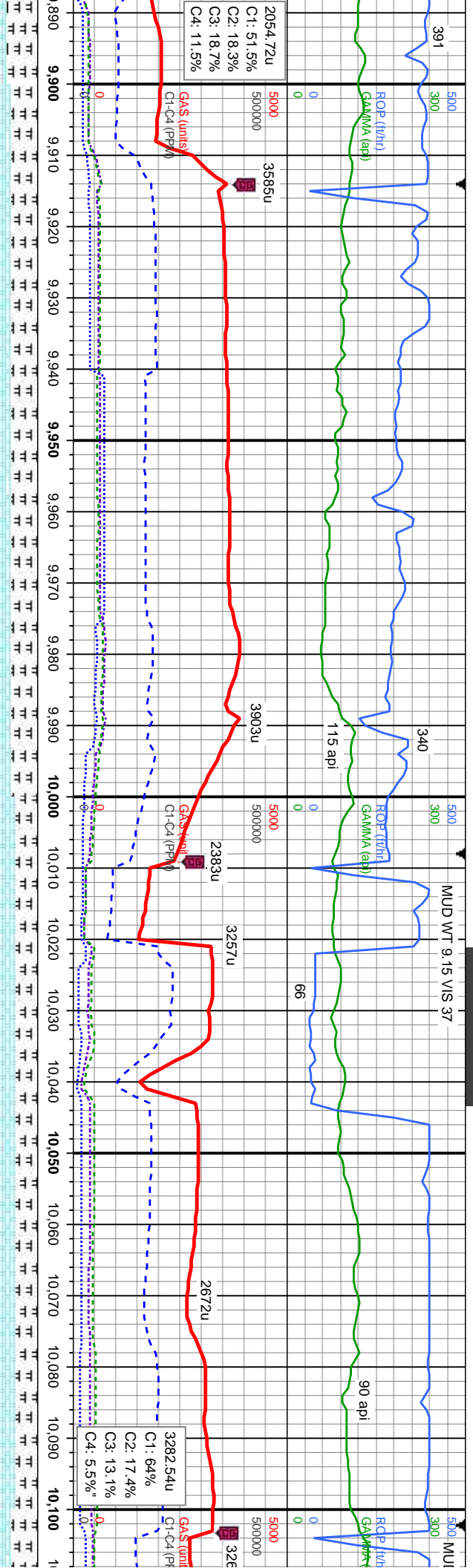
TVD (ft)

MD: 9.759°  
TVD: 6.567.3  
Inclination: 90.75°  
Azimuth: 268.58°  
VS: 3.697.67

TVD (ft)

MD: 9.853°  
TVD: 6.569.17  
Inclination: 86.97°  
Azimuth: 267.2°  
VS: 3.791.62

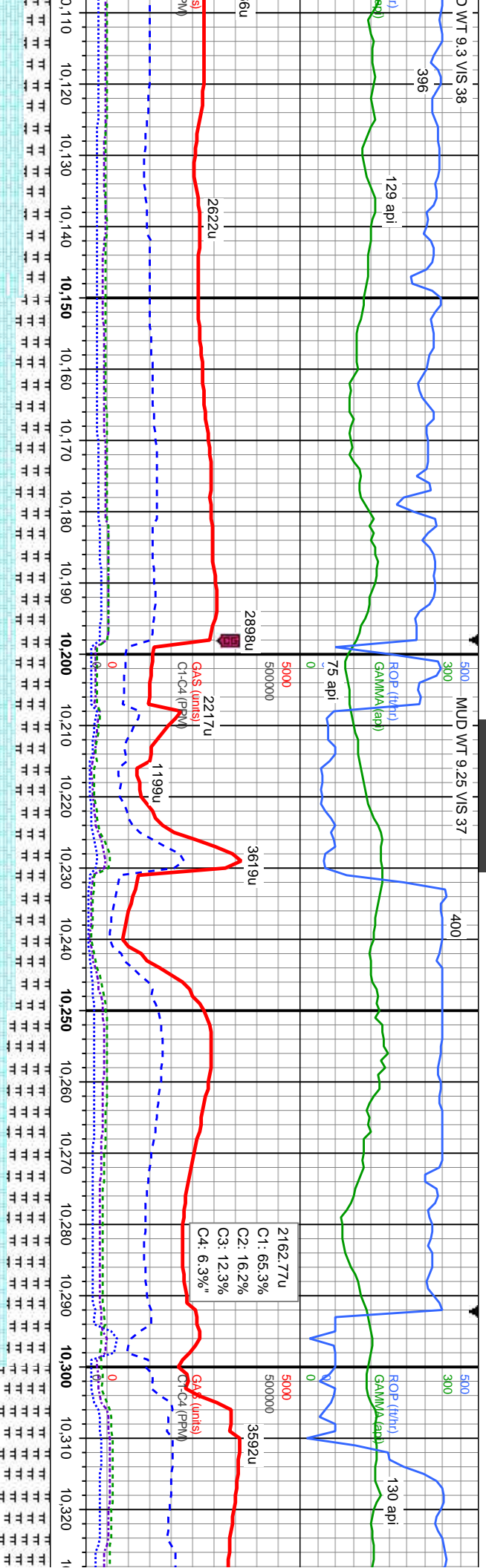


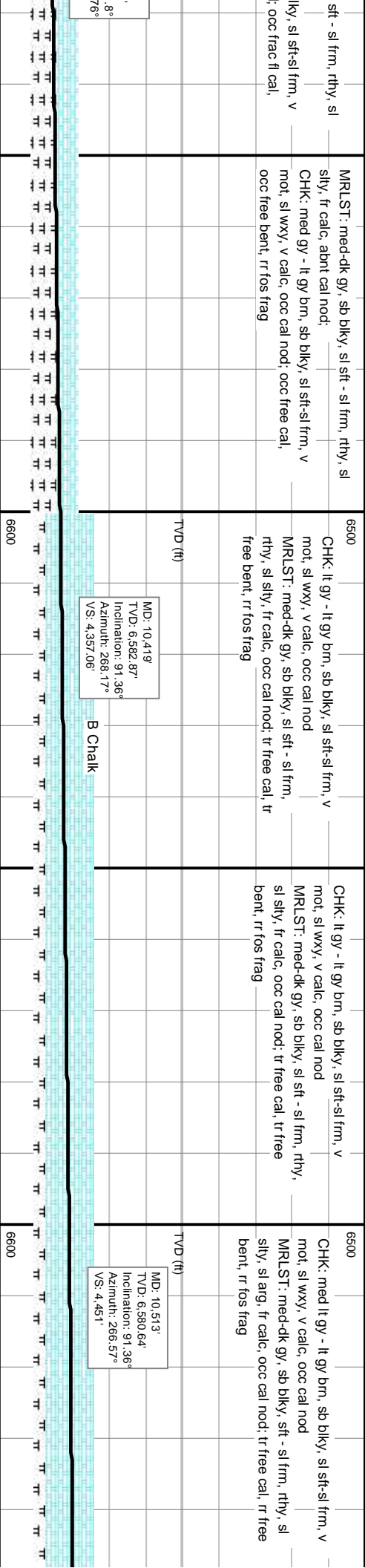


6500	CHK: med lt gy - lt gy brn, sb blk, sl sft-si frm, v mot, sl wxy, occ sl sily, v calc	6500	CHK: med lt gy - lt gy brn, sb blk, sl sft-si frm, v mot, sl wxy, r r sl sily, v calc	6500	CHK: lt gy - lt gy brn, sb blk, sl sft-si frm, v mot, sl wxy, r r sl sily, v calc	6500	CHK: lt gy - lt gy brn, sb blk, sl sft-si frm, v mot, sl wxy, r r sl sily, v calc	6500	CHK: lt gy - lt gy brn, sb blk, sl sft-si frm, v mot, sl wxy, r r sl sily, v calc
6500	MR.LST: med-dk gy, sb blk, sft - sl frm, rthy, sl aren, v calc; occ frac fl cal	6500	MR.LST: med-dk gy, sb blk, sft - sl frm, rthy, sl aren, v calc; occ frac fl cal	6500	MR.LST: med-dk gy, sb blk, sft - sl frm, rthy, sl aren, v calc; r frac fl cal, r fos frag	6500	MR.LST: med-dk gy, sb blk, sft - sl frm, rthy, sl aren, v calc; r frac fl cal, r fos frag	6500	MR.LST: med-dk gy, sb blk, sft - sl frm, rthy, sl aren, v calc; r frac fl cal, r fos frag
6500	MD: 9.947 TVD: 6,574.65' Inclination: 86.35° Azimuth: 266.78° VS: 3,885.41'	6500	MD: 10.041' TVD: 6,579.7 Inclination: 87.49° Azimuth: 269.1° VS: 3,979.25'	6500	MD: 10.041' TVD: 6,579.7 Inclination: 87.49° Azimuth: 269.1° VS: 3,979.25'	6500	MD: 10.041' TVD: 6,579.7 Inclination: 87.49° Azimuth: 269.1° VS: 3,979.25'	6500	MD: 10.041' TVD: 6,579.7 Inclination: 87.49° Azimuth: 269.1° VS: 3,979.25'
6600		6600		6600		6600		6600	

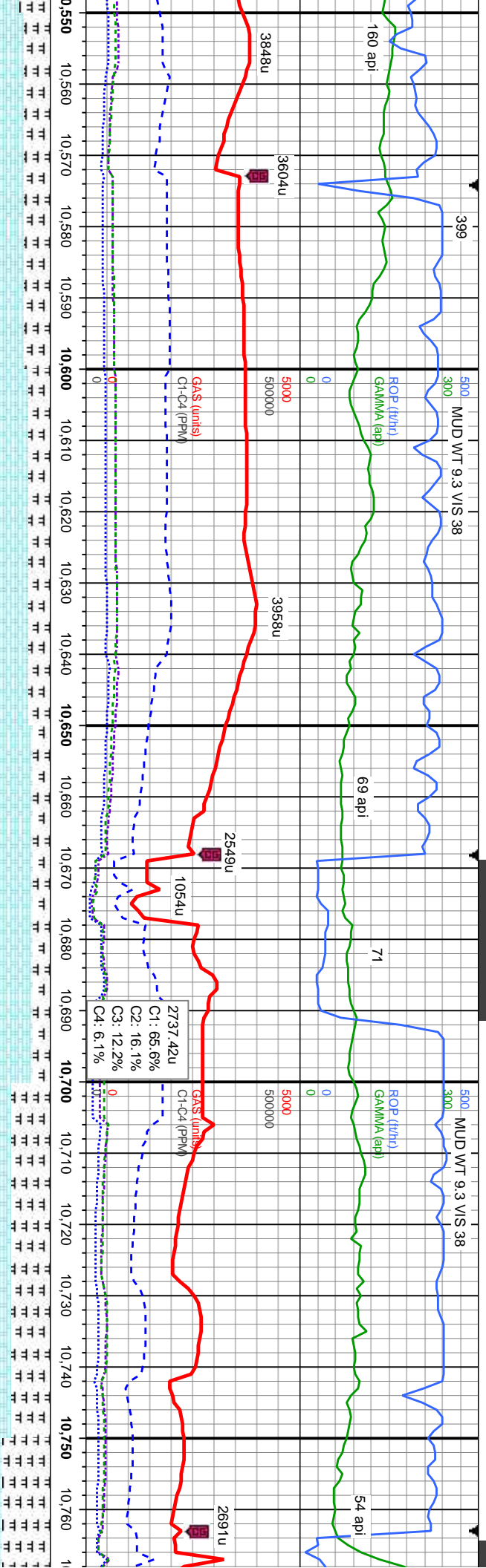












CHK: med lt gy - lt gy brn, sb blk, sl sft-sl frm, v  
mot, sl wxy, v calc, occ cal nod  
MRLST: med-dk gy, sb blk, sft - sl frm, rthy, sl  
sily, sl arg, fr calc, occ cal nod; tr free cal, tr  
free bent

CHK: med lt gy - lt gy brn, sb blk, sl sft-sl frm,  
v mot, sl wxy, v calc, tr cal nod  
MRLST: med-dk gy, sb blk, sft - sl frm, rthy, sl  
sily, sl arg, fr calc, tr cal nod; tr free cal, tr  
free bent

CHK: med lt gy - lt gy brn, sb blk, sl sft-sl  
frm, v mot, sl wxy, v calc, tr cal nod  
MRLST: med-dk gy, sb blk, sft - sl frm, rthy,  
sl sily, sl arg, fr calc, tr cal nod; tr free cal, tr  
free bent

CHK: med lt gy - lt gy brn, sb blk, sft-sl frm, v mot,  
sl wxy, v calc, tr cal nod  
MRLST: med-dk gy, sb blk, sft - sl frm, rthy, sl sily,  
sl arg, occ mot, fr-g calc, tr cal nod; tr frac fl cal,  
tr free bent

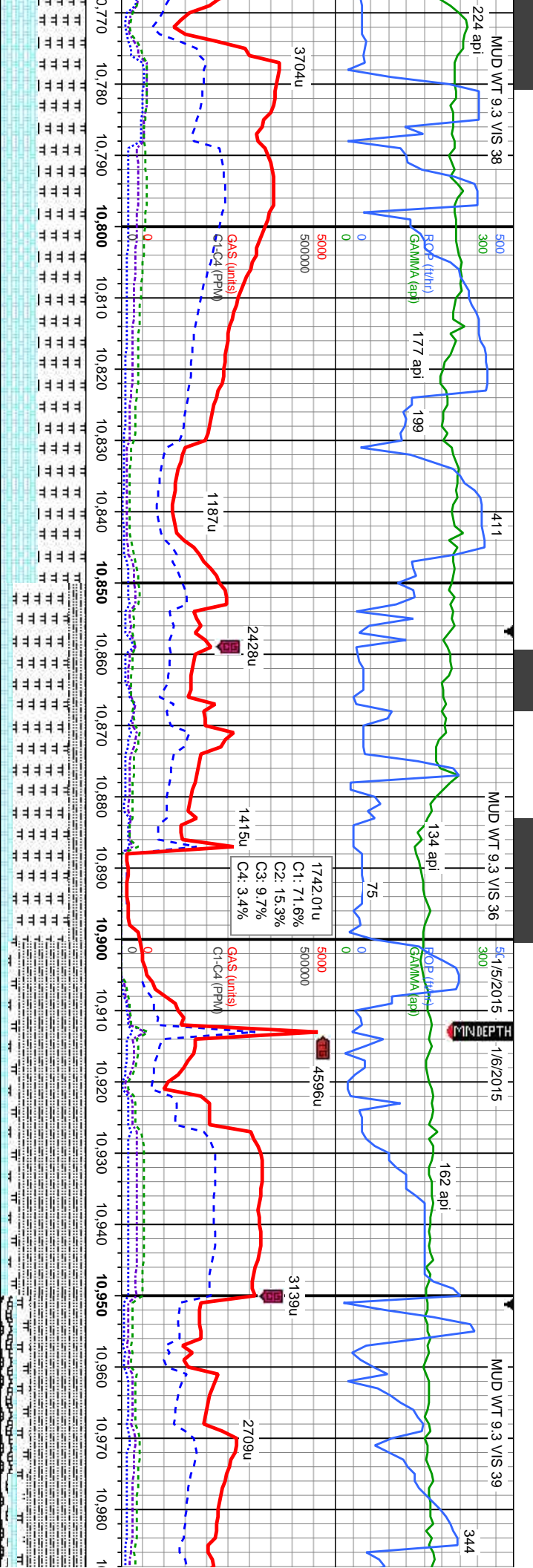
MRLST: med-dk g  
sily, abnt arg, occ  
CHK: med lt gy - lt  
mot, sl wxy, v calc  
free bent

TVD (ft)  
MD: 10,607'  
TVD: 6,578.84'  
Inclination: 90.84°  
Azimuth: 264.66°  
VS: 4,544.82'

TVD (ft)  
MD: 10,702'  
TVD: 6,578.03'  
Inclination: 90.13°  
Azimuth: 266.98°  
VS: 4,639.67'

B Chalk





MD: 10.796  
TVD: 6,577.82'  
Inclination: 90.13°  
Azimuth: 267.79°  
VS: 4,733.64'

MD: 10.890  
TVD: 6,578.4'  
Inclination: 89.16°  
Azimuth: 268.04°  
VS: 4,827.62'

MD: 10.985  
TVD: 6,579.7'  
Inclination: 8  
Azimuth: 266  
VS: 4,922.61'

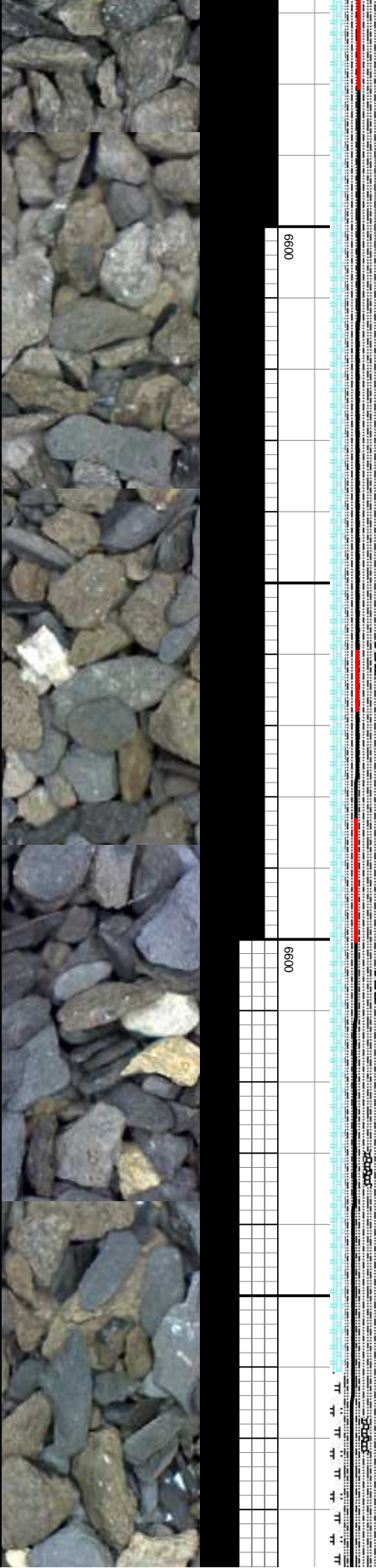
Sharon Springs

TOOH For New Mud Motor @ 10913 MD  
2:20pm MST 1-5-2015  
Resumed Drilling Lateral 9:30am MST 1/6/2015

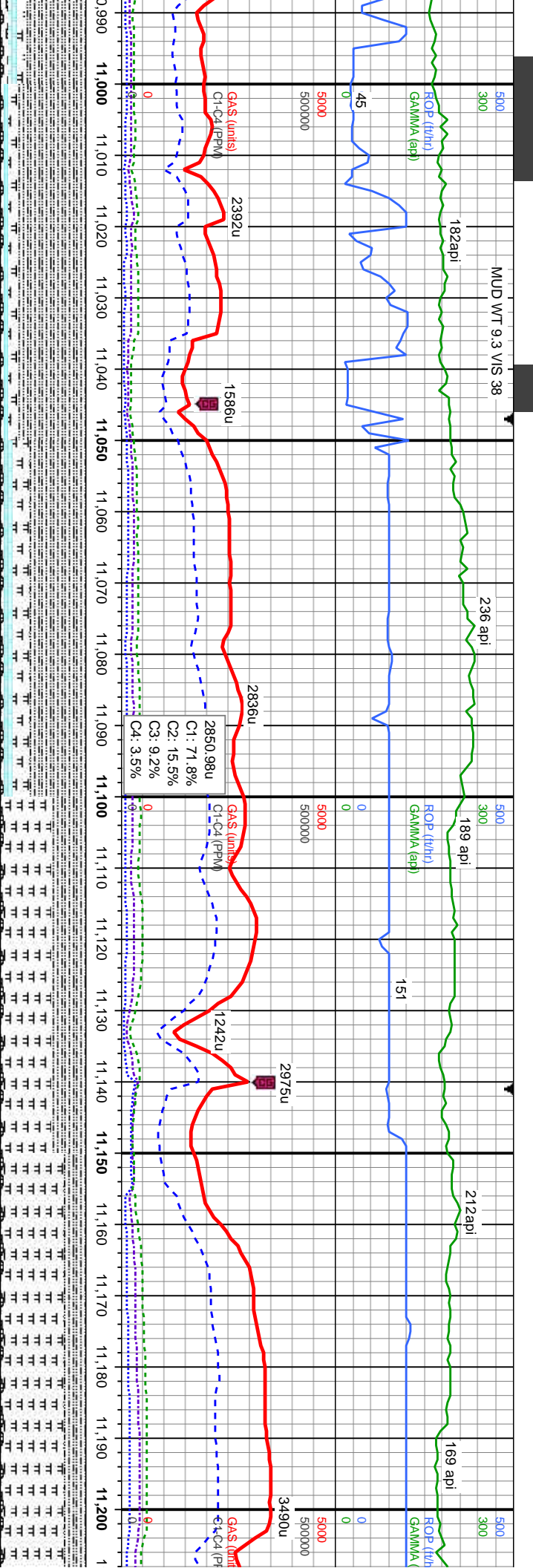
SL TV SH: med - dk gy - gy blk, sb ply-ply, sft - sl frm, silt tex, sl rthy lstr, sl calc  
MRLST: med-dk gy, sb blk, sl sft - frm, rthy, sl sily, abnt arg, tr mot, v calc, tr fos nod  
CHK: med lt gy - gy brn, sb blk, sft-si frm, v mot, sl wxy, v calc, rr cal nod; abnt bent

SL TV SH: med - dk gy - gy blk, sb ply-pl frm, silt tex, sl rthy lstr, sl calc  
MRLST: med-dk gy, sb blk, sl sft - frm, sily, abnt arg, tr mot, v calc, tr fos nod  
CHK: med lt gy - gy brn, sb blk, sft-si frm, v mot, sl wxy, v calc, rr cal nod  
BENT: olv - silver, med-lt gy, ply - sl flss, vlt, gt tex, bri yel mnrl flr

possible 48' Fault





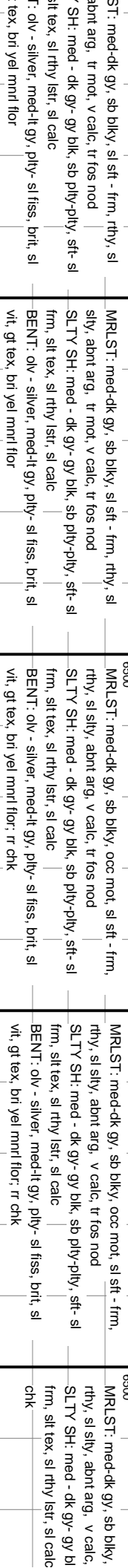


ly, sft- sl	6500	SLTY SH: med - dk gy- gy blk, sb pily- pily, sft- sl frm, sft tex, sl rthy lst, sl calc	SLTY SH: med - dk gy- gy blk, sb pily- pily, sft- sl frm, sft tex, sl rthy lst, sl calc	6500	SLTY SH: med - dk gy- gy blk, sb pily- pily, sft- sl frm, sft tex, sl rthy lst, sl calc	6500	MRSLT: med-dk gy, sb blk, sl sft - frm, rthy, sl sily, abnt arg, tr mot, v calc, tr fos nod	MRSLT: med-dk gy, sb blk, sl sft - frm, rthy, sl sily, abnt arg, tr mot, v calc, tr fos nod	6500	MRSLT: med-dk gy, sb blk, sl sft - frm, rthy, sl sily, abnt arg, tr mot, v calc, tr fos nod	6500	MRSLT: med-dk gy, sb blk, sl sft - frm, rthy, sl sily, abnt arg, tr mot, v calc, tr fos nod
rthy, sl		MRSLT: med-dk gy, sb blk, sl sft - frm, rthy, sl sily, abnt arg, tr mot, v calc, tr fos nod			MRSLT: med-dk gy, sb blk, sl sft - frm, rthy, sl sily, abnt arg, tr mot, v calc, tr fos nod		SLTY SH: med - dk gy- gy blk, sb pily- pily, sl calc	SLTY SH: med - dk gy- gy blk, sb pily- pily, sl calc		SLTY SH: med - dk gy- gy blk, sb pily- pily, sl calc		SLTY SH: med - dk gy- gy blk, sb pily- pily, sl calc
frm, v		CHK: med lt gy - gy brn, sb blk, sft-sl frm, v mot, mot, sl wxy, v calc, tr cal nod			CHK: med lt gy - gy brn, sb blk, sft-sl frm, v mot, sl wxy, v calc, tr cal nod		BENT: oliv - silver, med-lt gy, pily- sl fss, brlt, sl vlt, gt tex, bri yel mnrl flr	BENT: oliv - silver, med-lt gy, pily- sl fss, brlt, sl vlt, gt tex, bri yel mnrl flr		BENT: oliv - silver, med-lt gy, pily- sl fss, brlt, sl vlt, gt tex, bri yel mnrl flr		BENT: oliv - silver, med-lt gy, pily- sl fss, brlt, sl vlt, gt tex, bri yel mnrl flr
brlt, sl		BENT: oliv - silver, med-lt gy, pily- sl fss, brlt, sl vlt, gt tex, bri yel mnrl flr			BENT: oliv - silver, med-lt gy, pily- sl fss, brlt, sl vlt, gt tex, bri yel mnrl flr							
		TVD (ft)			TVD (ft)							

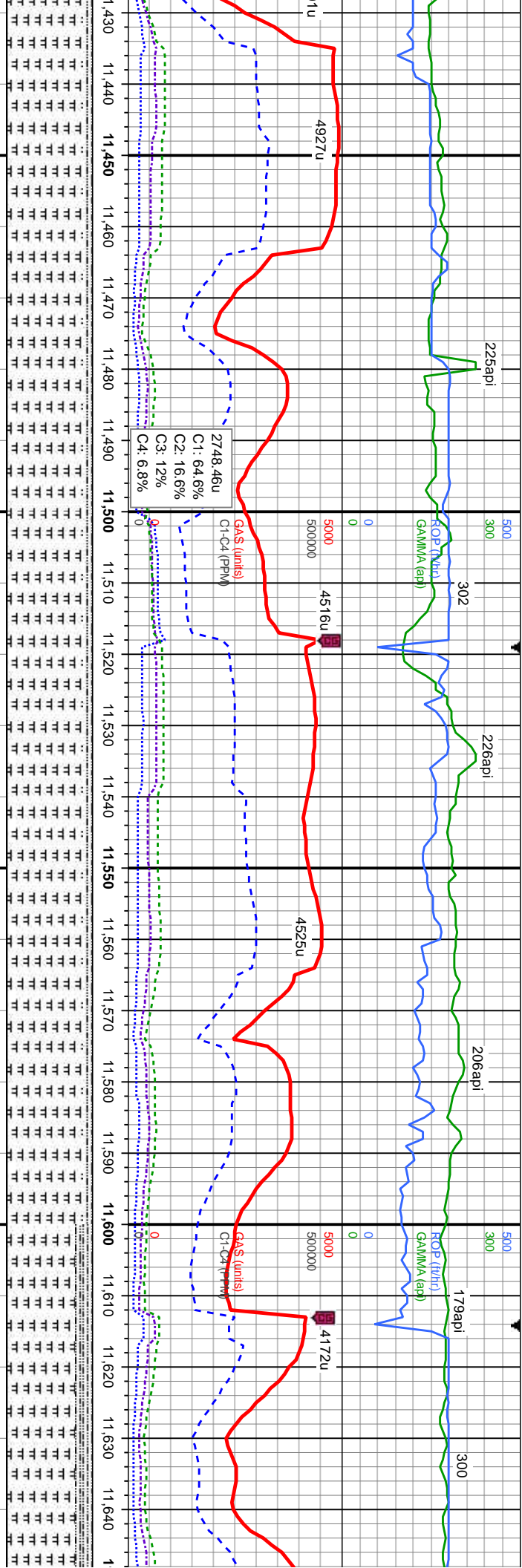
MD: 11.079  
TVD: 6,580.59  
Inclination: 89.87°  
Azimuth: 268.11°  
VS: 5.016.6

MD: 11.174  
TVD: 6,580.8  
Inclination: 89.87°  
Azimuth: 267.65°  
VS: 5.111.59









occ mot, sl sft - frm,  
tr fos nod  
k, sb pily-pily, sft- sl  
abunt bent, occ

MRSLT: med-dk gy, sb blk, occ mot, sl sft - frm,  
rthy, sl sily, abnt arg, v calc, tr fos nod  
SLTY SH: med - dk gy- gy blk, sb pily-pily, sft- sl  
frm, silt tex, sl rthy lstr, sl calc; abunt bent, occ  
chk

6500

MRSLT: med-dk gy, sb blk, occ mot, sl sft - frm,  
rthy, sl sily, abnt arg, v calc, tr fos nod  
SLTY SH: med - dk gy- gy blk, sb pily-pily, sft- sl  
frm, silt tex, sl rthy lstr, sl calc; abunt bent, r chk

6500

MRSLT: med-dk gy, sb blk, occ mot, sl sft - frm,  
rthy, sl sily, abnt arg, v calc, tr fos nod  
SLTY SH: med - dk gy- gy blk, sb pily-pily, sft- sl  
frm, silt tex, sl rthy lstr, sl calc; abunt bent, r chk

6500

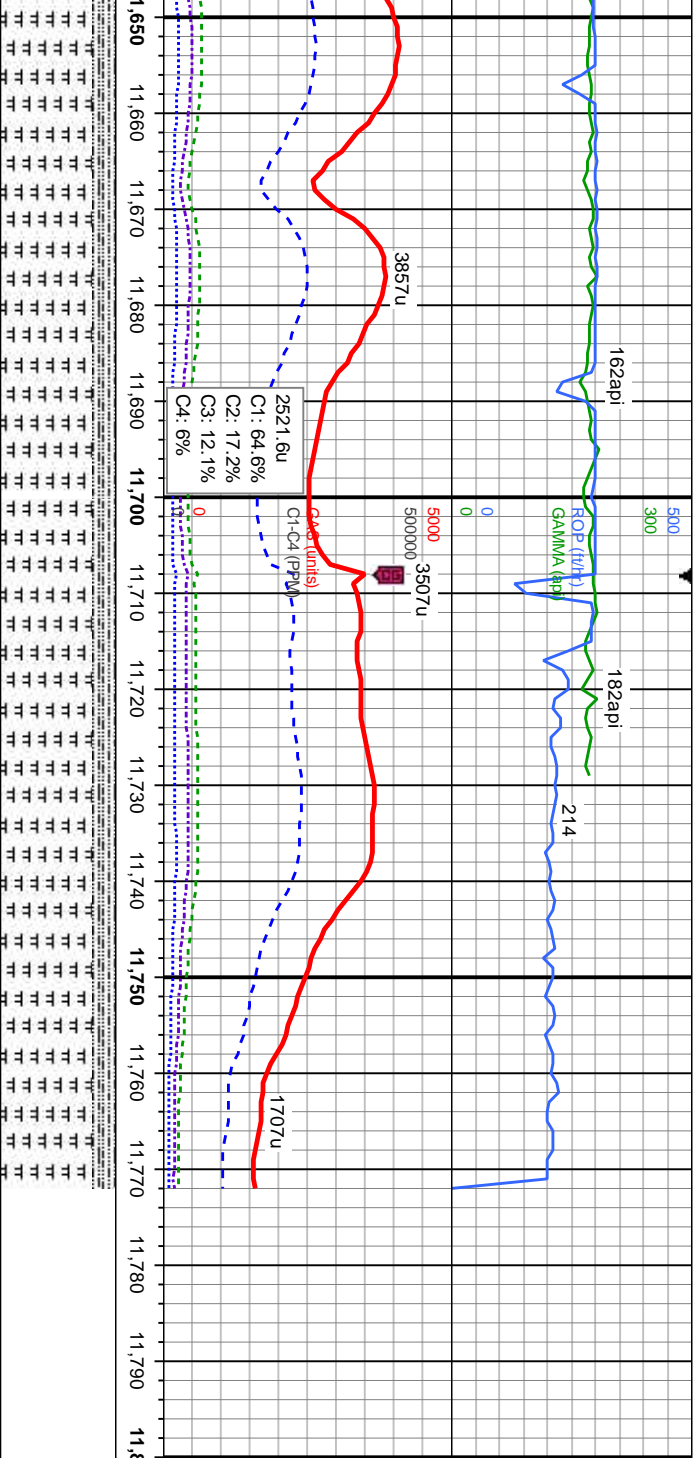
MRSLT: med-dk gy, sb blk, occ mot, sl sft - frm,  
rthy, sl sily, abnt arg, v calc, tr fos nod  
SLTY SH: med - dk gy- gy blk, sb pily-pily, sft- sl  
frm, silt tex, sl rthy lstr, sl calc; occ bent

MD: 11,458'  
TVD: 6,581.46'  
Inclination: 90.57°  
Azimuth: 268.11°  
VS: 5,395.51'

MD: 11,552'  
TVD: 6,580.53'  
Inclination: 90.57°  
Azimuth: 267.72°  
VS: 5,489.49'

MD: 11,640'  
TVD: 6,557'  
Inclination:  
Azimuth:  
VS: 5,584'





MRLST: med-dk gy, sb blk, occ mot, sl sft - frm, rthy, sl sily, abnt arg, v calc, tr fos nod SLTY SH: med - dk gy- gy blk, sb pily-pily, sft- sl frm, slt tex, sl rthy lstr, sl calc, occ bent	6500	MRLST: med-dk gy, sb blk, abnt mot, sl sft - frm, rthy, sl sily, abnt arg, v calc, tr fos nod SLTY SH: med - dk gy- gy blk, sb pily-pily, sft- sl frm, slt tex, sl rthy lstr, sl calc, abnt bent	TD 11,772MD 7:30pm MST 1/6/2015
MRLST: med-dk gy, sb blk, occ mot, sl sft - frm, rthy, sl sily, abnt arg, v calc, tr fos nod SLTY SH: med - dk gy- gy blk, sb pily-pily, sft- sl frm, slt tex, sl rthy lstr, sl calc, occ bent	6600	MRLST: med-dk gy, sb blk, abnt mot, sl sft - frm, rthy, sl sily, abnt arg, v calc, tr fos nod SLTY SH: med - dk gy- gy blk, sb pily-pily, sft- sl frm, slt tex, sl rthy lstr, sl calc, abnt bent	TD 11,772MD 7:30pm MST 1/6/2015

