

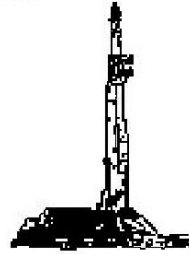
**GOOLSBY BROTHERS**  
and associates, inc.

575 Union Blvd, Suite 208  
Lakewood, CO 80228  
303-945-2860 Office



Geological Wellsite  
Supervision

[www.goolsbybrothers.com](http://www.goolsbybrothers.com)



Scale 1:240 (5"=100') Imperial  
Measured Depth Log

Well Name: **Mulga 28C-23HZ**  
Well Id:  
Location: **Sec. 23 T2N R67W Weld County, CO.**  
License Number: **API: 051233925500 AFE: 2094827** Region: **Wattenberg**  
Spud Date: **July 23, 2014** Drilling Completed: **July 29, 2014**  
Surface Coordinates: **275' FSL, 850' FWL**  
**Lat. 40.1171525, Long. -104.8589598, Sec.23, T2N R67W**  
Bottom Hole **1' FNL, 685' FWL**  
Coordinates: **Lat. 40.1308310, Long. -104.8586100, Sec. 23, T2NR67W**  
Ground Elevation (ft): **4947'** K.B. Elevation (ft): **4972'**  
Logged Interval (ft): **7150' To: 12534 Total Depth (ft): 12534'**  
Formation: **Codell**  
Type of Drilling Fluid: **LSND (Polymer-Water)**  
Printed by HORIZONTAL.LOG from WellSight Systems 1-800-447-1534 [www.WellSight.com](http://www.WellSight.com)

**OPERATOR**

Company: **Anadarko Petroleum Corporation**  
Address: **Granite Tower - 1099 18th St, Ste 1800**  
**Denver, CO 80202**  
**CO Geologist, Tom Birmingham.**

**GEOLOGIST**

Name: **George Bejan, Dan Kabala**  
Company: **Goolsby Brothers & Assoc. (GBA), Inc. ([www.goolsbybrothers.com](http://www.goolsbybrothers.com))**  
Address: **575 Union Blvd.**  
**Suite 208,**  
**Lakewood CO. 80228**

## E-logs

MWD Gamma

## Casing

Intermediate casing: 7", 26#, HTC 110 LTC, set at 7877'

Liner: 4 1/2", packer and assembly, 11.5#, HCP 110, LTC & D2X, set at 12527'

## Comments

Drilling Contractor: H&P 311

Pumps 1 & 2: Gardner Denver PZ 11 6" x 11" (.0914 bbl/stk)

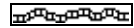
Rig Manager: Jack Truett, James Baggett.

Drillers: Michael Munroe, Christopher Beckstead

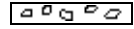
## ROCK TYPES



Anhy



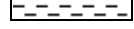
Bent



Brec



Cht



Cyst



Coal



Oil sat.



Congl



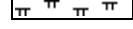
Dol



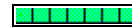
Gyp



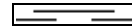
Lmst



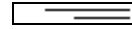
Mrlst



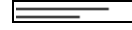
Salt



Shale



Shcol



Shgy



Ss



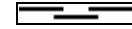
Sltst



Ss



Chalk



Carb sh



Sltly sh

## ACCESSORIES

### MINERAL

	Anhy
	Arggrn
	Arg
	Bent
	Bit
	Brecfrag
	Calc
	Carb
	Chtdk
	Chtlit
	Dol
	Feldspar
	Ferrpel
	Ferr
	Glau
	Gyp
	Hvymin
	Kaol
	Marl

	Minxl
	Nodule
	Phos
	Pyr
	Salt
	Sandy
	Silt
	Sil
	Sulphur
	Tuff

### FOSSIL

	Algae
	Amph
	Belm
	Bioclst
	Brach
	Bryozoa
	Cephal
	Coral

	Crin
	Echin
	Fish
	Foram
	Fossil
	Gastro
	Oolite
	Ostra
	Pelec
	Pellet
	Pisolite
	Plant
	Strom

### STRINGER

	Chlkstg
	Anhy
	Arg
	Bent
	Coal

	Dol
	Gyp
	Ls
	Mrst
	Sltstrg
	Ssstrg

### TEXTURE

	Boundst
	Chalky
	Cryxln
	Earthy
	Finexln
	Grainst
	Lithogr
	Microxln
	Mudst
	Packst
	Wackest

## OTHER SYMBOLS

### OIL SHOWS

	Even
	Spotted
	Ques
	Dead
	Vspotty
	near even

### POROSITY TYPE

	Earthy
	Fenest
	Fracture
	Inter
	Moldic
	Organic

	Pinpoint
	Vuggy

### ROUNDING

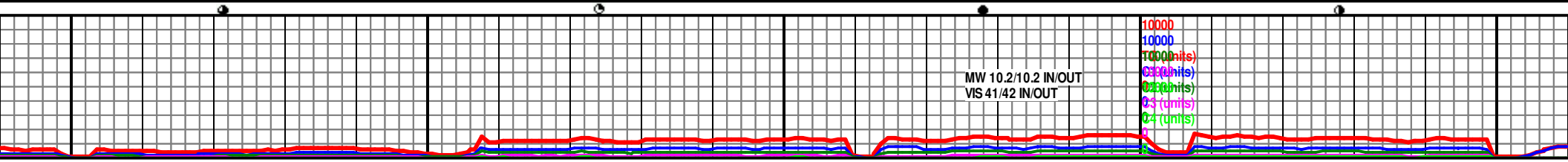
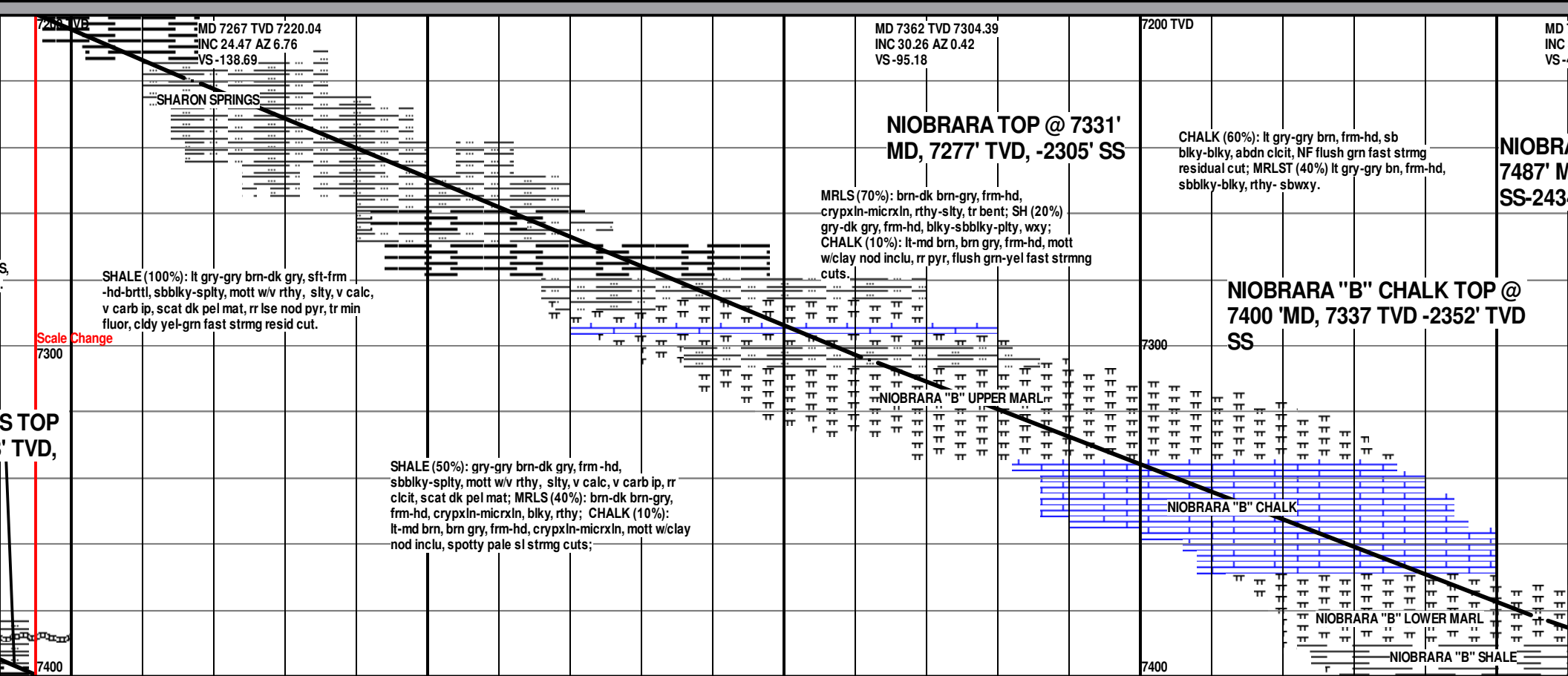
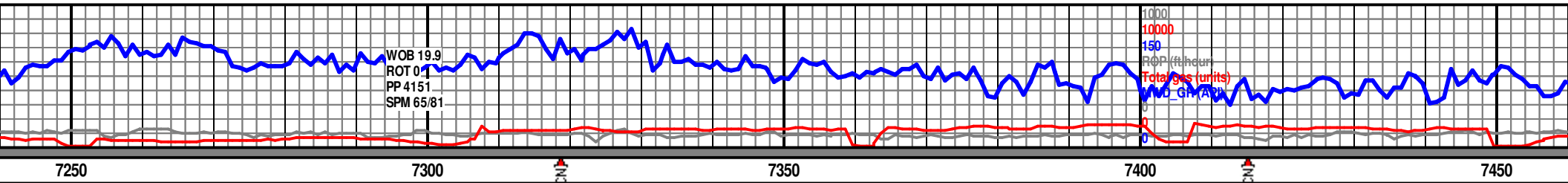
	Rounded
	Subrnd
	Subang

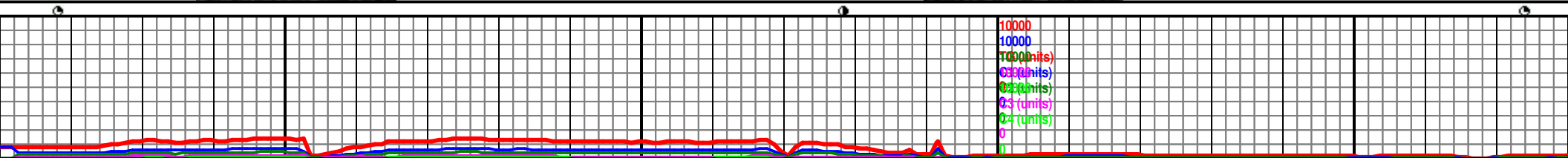
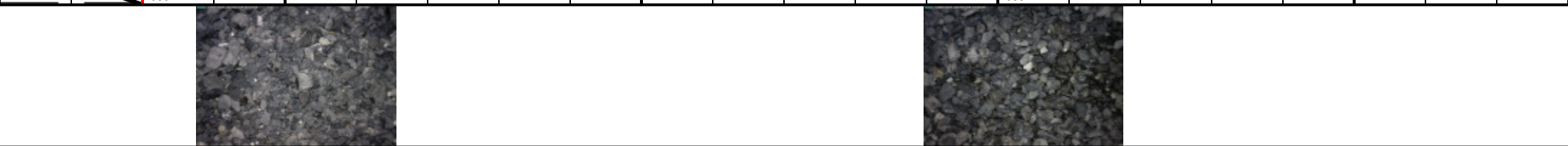
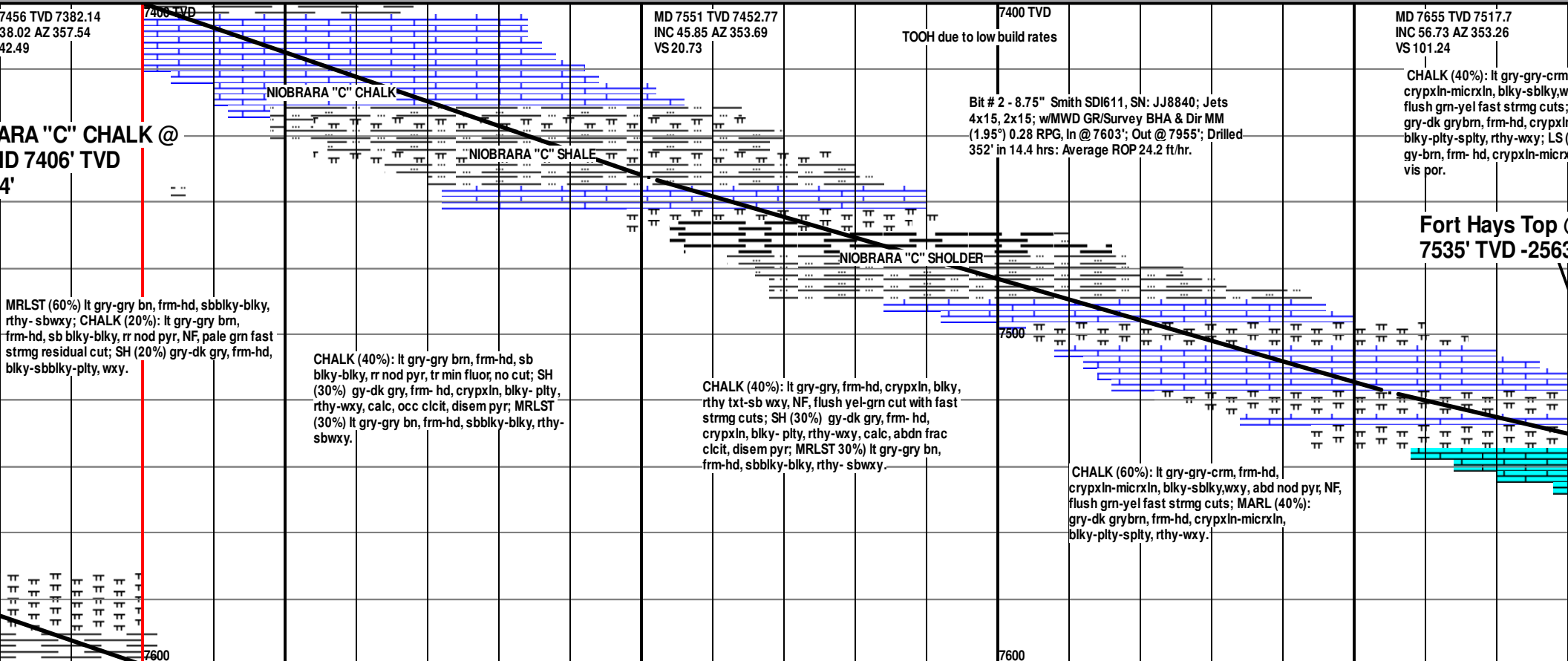
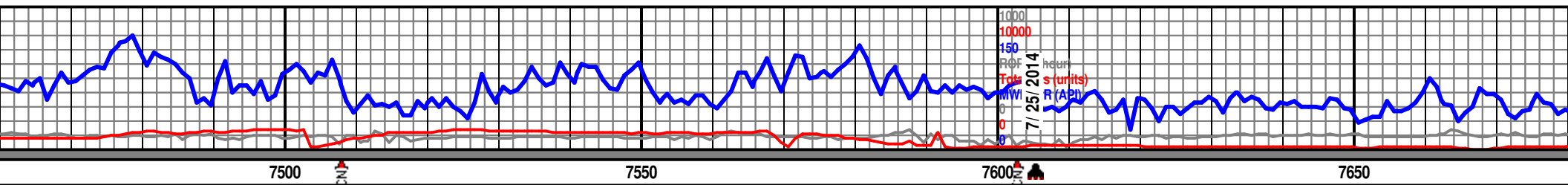
	Angular
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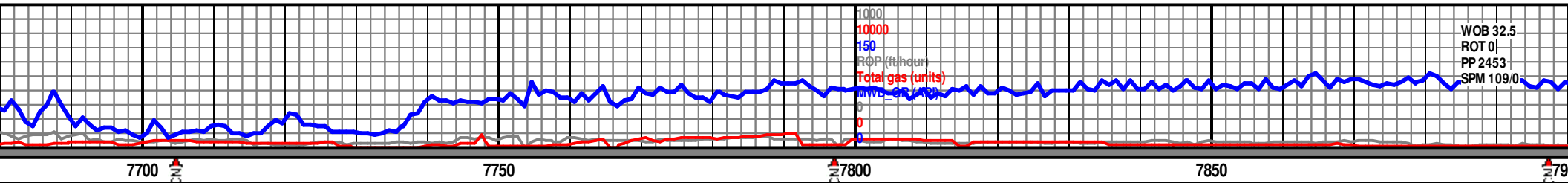
### SORTING

	Well
	Moderate
	Poor

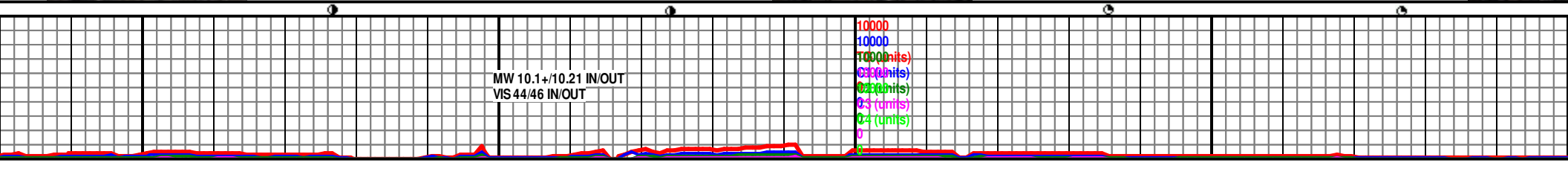


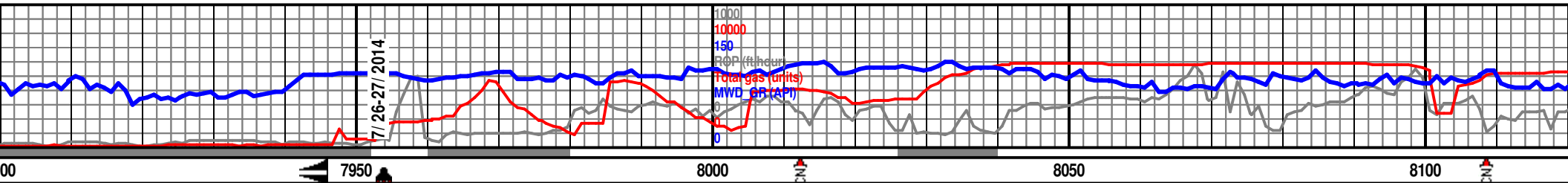






<p>MD 7702 TVD 7540.81 INC 64.34 AZ 353.12 VS 141.84</p> <p>MD 7749 TVD 7558.61 INC 71.12 AZ 353.28 VS 185</p> <p>MD 7796 TVD 7570.85 INC 78.67 AZ 353.23 VS 230.03</p> <p>MD 7843 TVD 7577.19 INC 85.8 AZ 352.76 VS 276.22</p>	<p>LS (70) %: lt brn gy-brn, frm-hd, crypxln-micrxln, fri, wxy no est vis por, NF, flush yel-grn fast strmg cut; SS (30%): lt brn gy-dk gy, abdn   clr-trans, vfg-fg, sb ang-sb rnd, md-w srt, w cmt, abun silic cmt, 10-12% est vis por, occ disem pyr.</p>	<p>SS (100%): lt brn gy-dk gy, rr clr-trans, vfg-fg, sb ang-sb rnd, md-w srt, w cmt, abun silic cmt, 10-12% est vis por, rr disem pyr, &lt;5% LS, NF, dull sl strmg cut.</p>	<p>SS (100%): lt brn gy-dk gy, rr clr-trans, vfg-fg, sb ang-sb rnd, md-w srt, w cmt, abun silic cmt, 10-12% est vis por, rr disem pyr, tr LS, tr SH, NF, dull yel with fast strmg cuts.</p>	<p>SS: (60%) lt brn gy-dk gy, vlf-fg, rr ufg, m cmt, m w srt, most sbmd, occ sbang, est vis por 10-12%; SH: (40%) v dk gy-blk, frm, plty, fiss, sb wxy-wxy, n silty, sl carb, NSF, sl milky cut, fr rsd rng flor.</p>	<p>Carlie SH</p>
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ICP reached @ 7955' MD, 16:35 hours,  
7/25/14. CONDITION HOLE, TOH, 7" CASING, SET  
@ 7944.6', WT: 26 ppf; Grade: HCP110, SET @  
MD 7944.6'.

Bit # 3 - 6.125" ULTERRA U516S, SN: 26514;  
Jets 4x18, 2x20; w/MWD GR/Survey BHA & Dir  
MM (1.95") 0.28 RPG, In @ 7955'; Out @ 9559';  
Drilled 1604' in 10.5 hrs: Average ROP 152.62  
ft/hr.

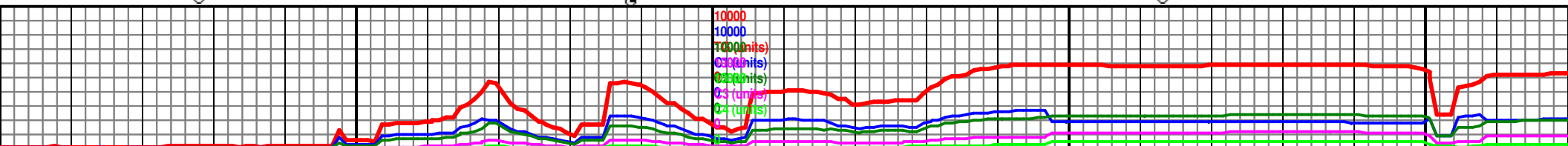
SH: (60%) v dk gy-blk, frm, plty, fiss, sb wxy-wxy,  
n silty, sl carb, NSF, cldy cut with fast strmg  
cuts; SS: (40%) gy- gysh bn-dkgysh bn - dk bn,  
vlf-lfg, rr ufg, m cmt, m w srt, most sbrnd, occ  
sbang, est vis por 10-12%.

SS (80%): lt brn gy-dk gy, friable, fn w occ med  
grns, subang-rnd, mod sphrcy md-w srt, grn  
suprtd, 8-10% vis por, pnt-cntct, no rxn w hcl, NF,  
mod-fst dull whi cloudy cut, fnt-mod yllw-whi res  
ring, tr SH, CMT (20%)

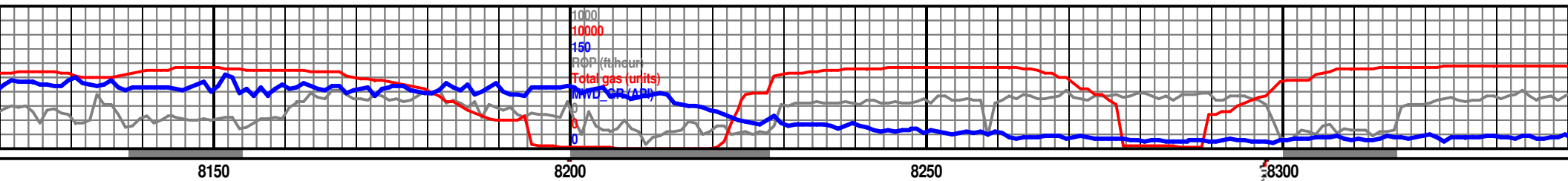
SS (90%): lt brn gy-dk gy, friable, fn w occ med  
grns, subang-rnd, md sbrnd md-w srt, grn suprtd,  
8-10% vis por, NF, mod-fst dull wh cldy cut,  
fnt-mod yllw-whi res ring; SH: (10%) v dk gy-blk,  
frm, plty, fiss, sb wxy-wxy, n silty, sl carb.

Projection to bit

7600







MD 8139 TVD 7562.86  
INC 93.93 AZ 4.2  
VS 571.21

7430 TVD

MD 8233 TVD 7558.64  
INC 91.21 AZ 2.35  
VS 664.95

MD 8328 TVD  
INC 90.5 AZ 1.4  
VS 759.89

SS (90%): lt brn gy-dk gy, frm-hd, fn w occ med  
grms, subang-rnd, md sbmd md-w srt, 8-10% vis  
por, NF, mod-fst dull whi cloudy cut, fnt-mod  
yllw-wh res ring, LS (10%) lt brn gy-brn, frm-hd,  
crypxln-micrxln, fri, wxy no est vis por,

Scale Change  
7530

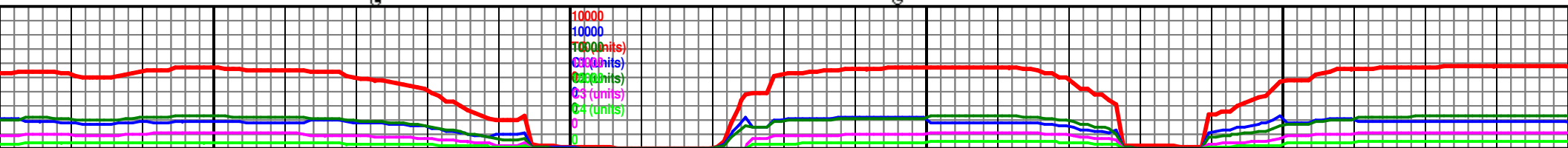
Ft Hays LS

Codell SS

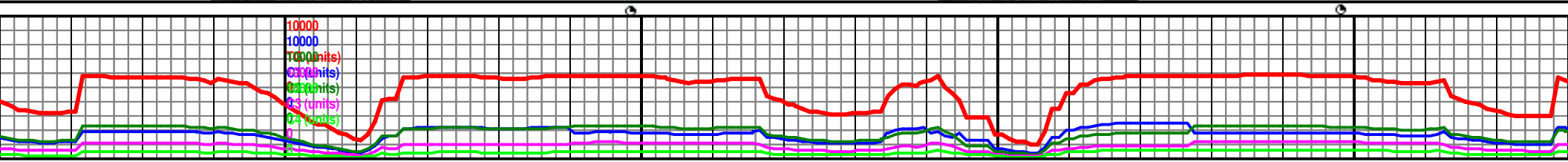
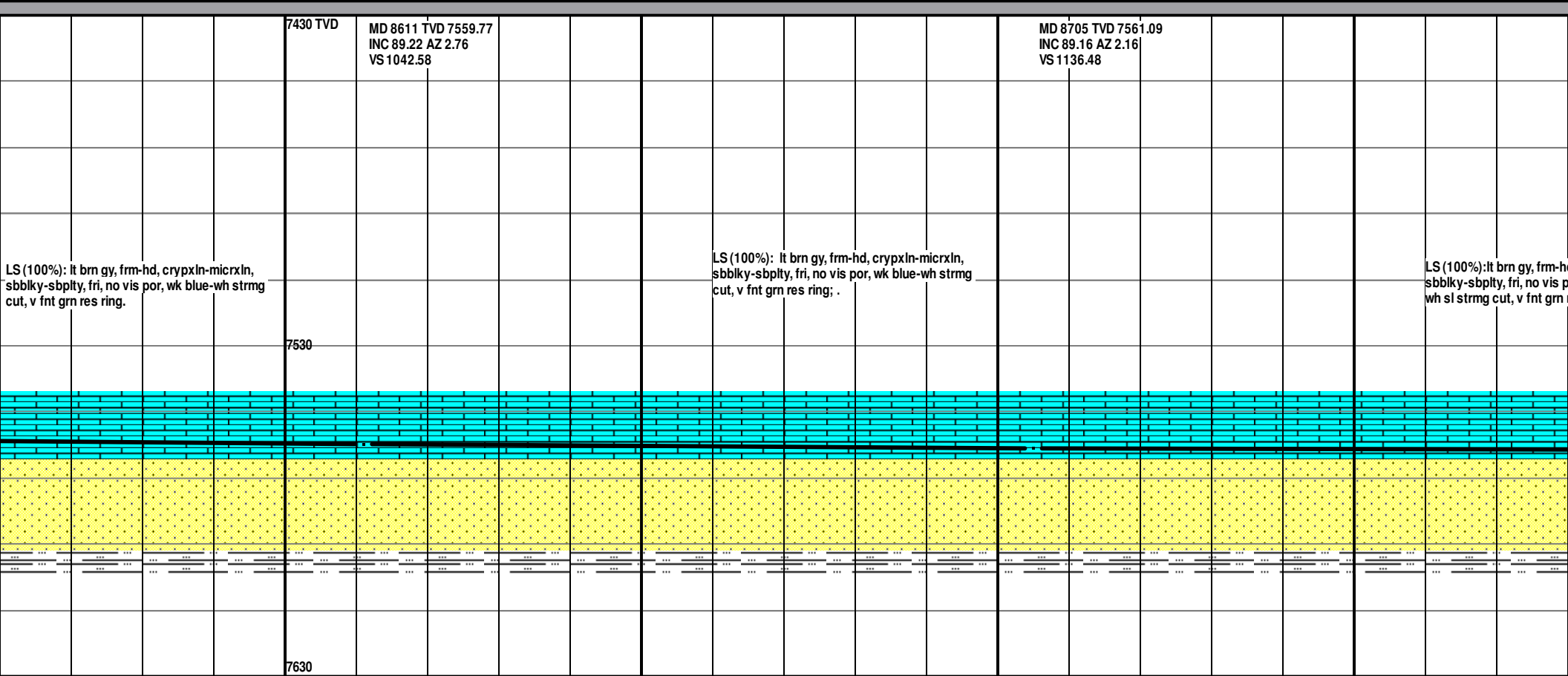
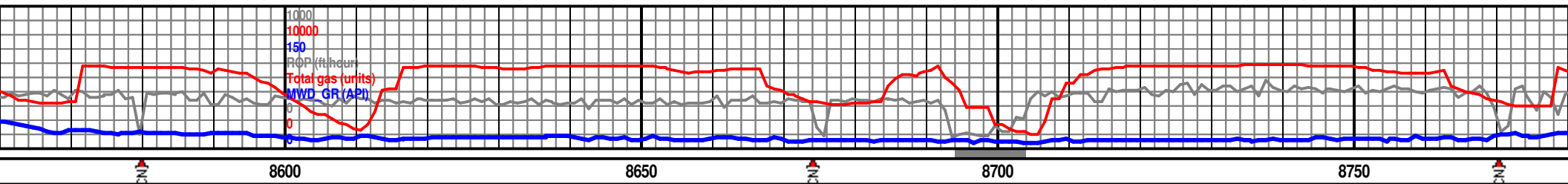
Carlile SH

LS (90%): lt brn gy, frm-hd, crypxln-micrxln,  
sbbky-sbply, fri, no vis por, wk blue-wh strmg  
cut, v fnt gm res ring; SH (10%) gry-dk gry,  
frm-hd, blk-sbbky-pty, wxy.

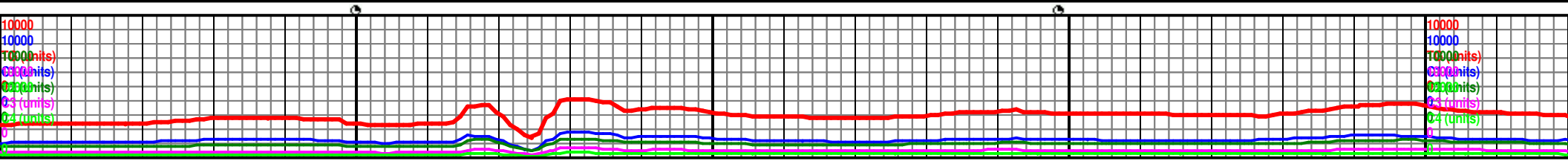
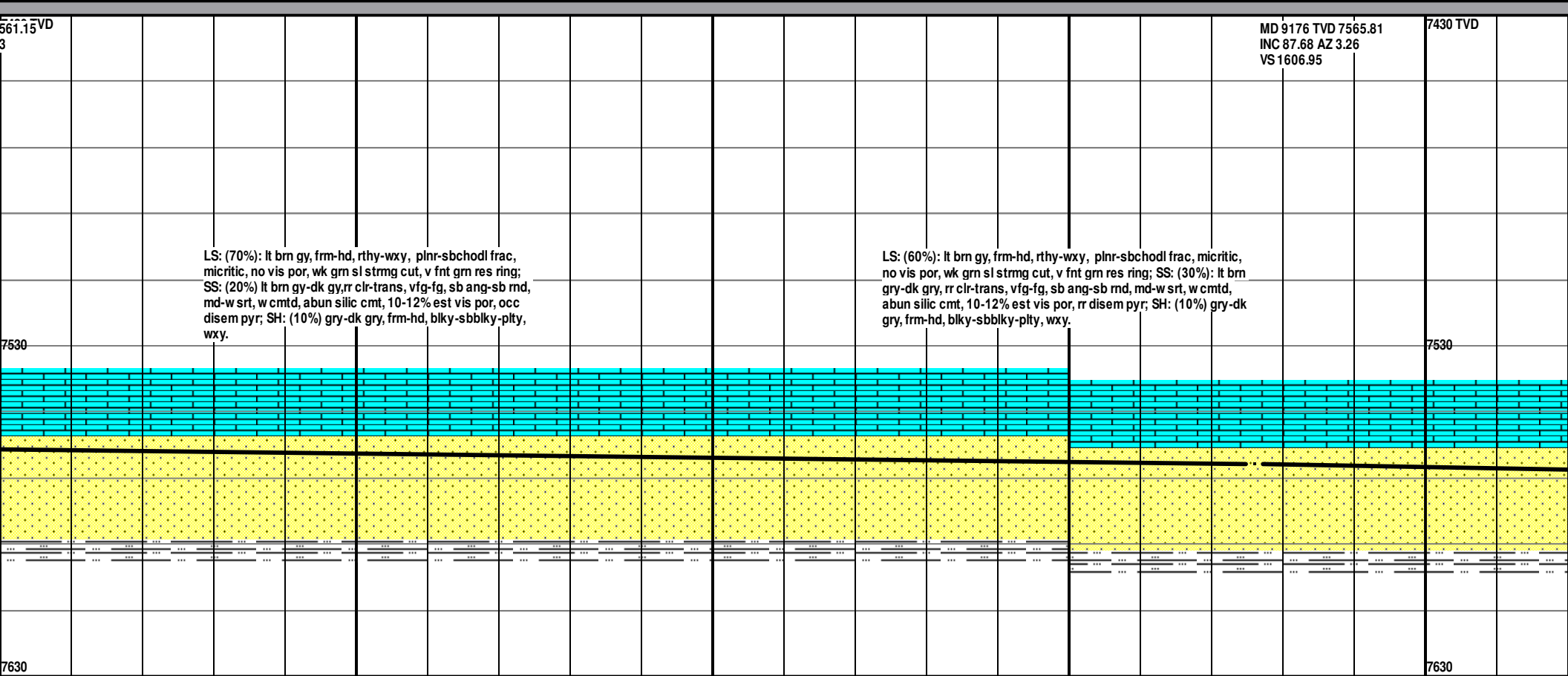
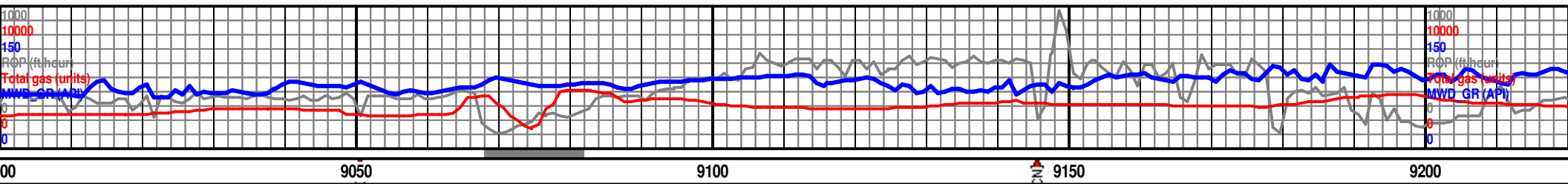
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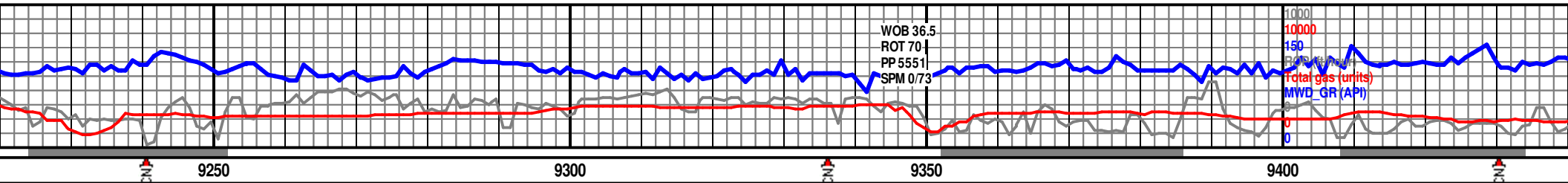












LS: (60%): lt brn gy, frm-hd, rthy-wxy, plnr-sbchodl frac, micritic, no vis por, fst good wh blooming cut, good wh res ring. SS: (30%) lt brn gy-dk gy, rr clr-trans, vfg-fg, sb ang-sb rnd, md-w srt, w cmt, abun silic cmt, 10-12% est vis por, rr disem pyr; SH: (10%) v dk gy-blk, frm, plty, fiss, sb wxy-wxy, n slty, sl carb.

LS (40) %: lt brn-gybrn, frm- hd, crypxln-micrxln, fri, wxy no est vis por, NF, flush yel-grn fast strmg cut; SS (40%): lt brn gy-dk gy, abdn clr-trans, vfg-fg, sb ang-sb rnd, md-w srt, w cmt, abun silic cmt, 10-12% est vis por, occ disem pyr; SH (20%) v dk gy-blk, frm, plty, fiss, sb wxy-wxy, n slty, sl carb.

MD 9365 TVD 7572.9  
INC 88.02 AZ 0.84  
VS 1795.69

7430 TVD

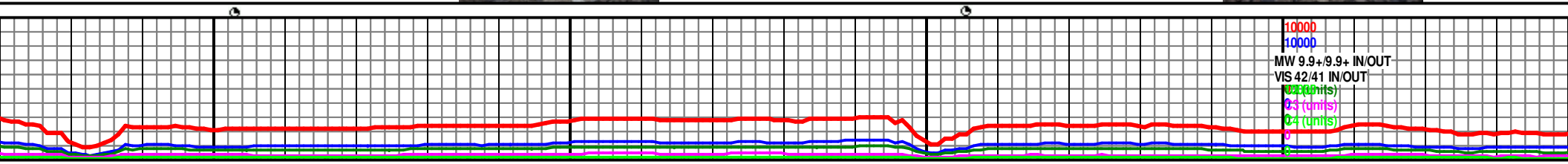
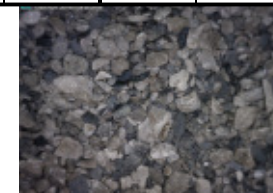
Ft Hays LS

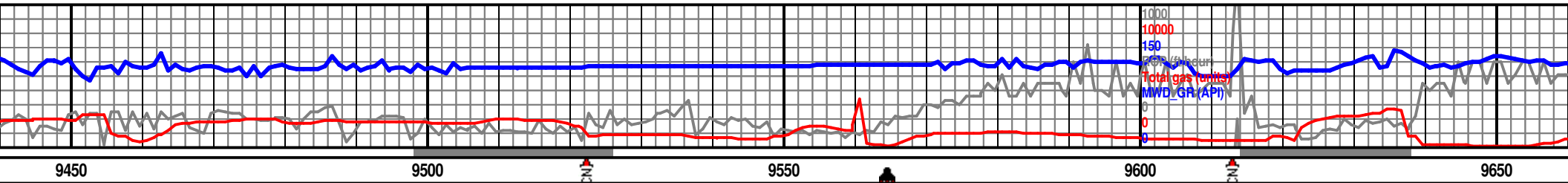
Code II SS

Carille SH

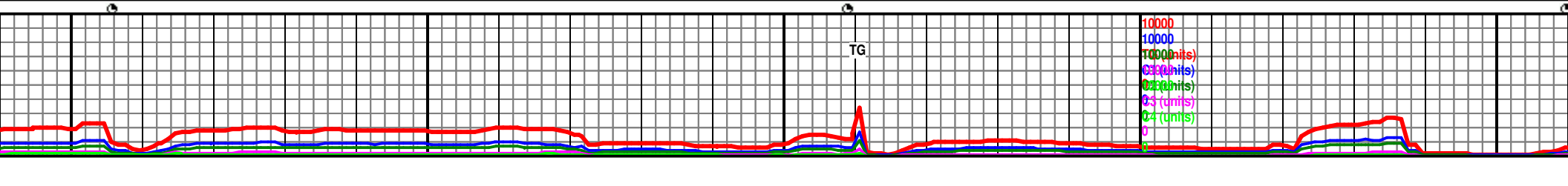
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7630



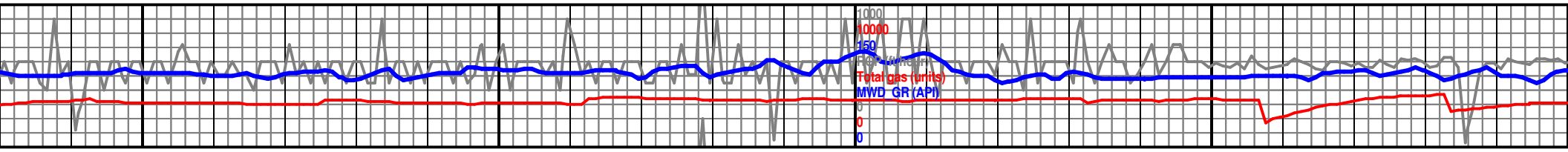


<p>MD 9459 TVD 7574.85 INC 89.6 AZ 358.95 VS 1889.66</p> <p>SH (50%) v dk gy-blk, frm, plty, fiss, sb wxy-wxy, n slty, sl carb; SS (40%): lt brn gy-dk gy, abdn clr-trans, vfg-fg, sb ang-sb rnd, md-w srt, w cmt, abun silic cmt, 10-12% est vis por, occ disem pyr, pale yel-grm sl strmg cut; LS (10) %: lt brn gy-brn, frm- hd, crypxln-micrxln, fri, wxy no est vis por.</p>	<p>MD 9553 TVD 7575.18 INC 90 AZ 359.7 VS 1983.65</p> <p>TOOH for MM</p> <p>Bit # 4 - 6.125" ULTERA U513S, SN: 26514; Jets 4x18, 2x20; w/MWD GR/Survey BHA &amp; Dir MM (1.95") 0.28 RPG, In @ 9559'; Out @ 12534'; Drilled 2975' in 16.42 hrs: Average ROP 181.18 ft/hr.</p>	<p>7430 TVD</p> <p>7530</p> <p>7630</p>	<p>MD 9647 TVD 7575.18 INC 90.77 AZ 0.0 VS 2077.64</p> <p>SH (80%): gy-dk gy, frm- wxy-rthy, slty-grtty thru wh-blue cldy cut, v wk b lt brn gy-dk gy, abdn lse vfg-fg, sb ang-sb rnd, m abun silic cmt, non-sl c</p>
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9900

9950

10000

10050

10100

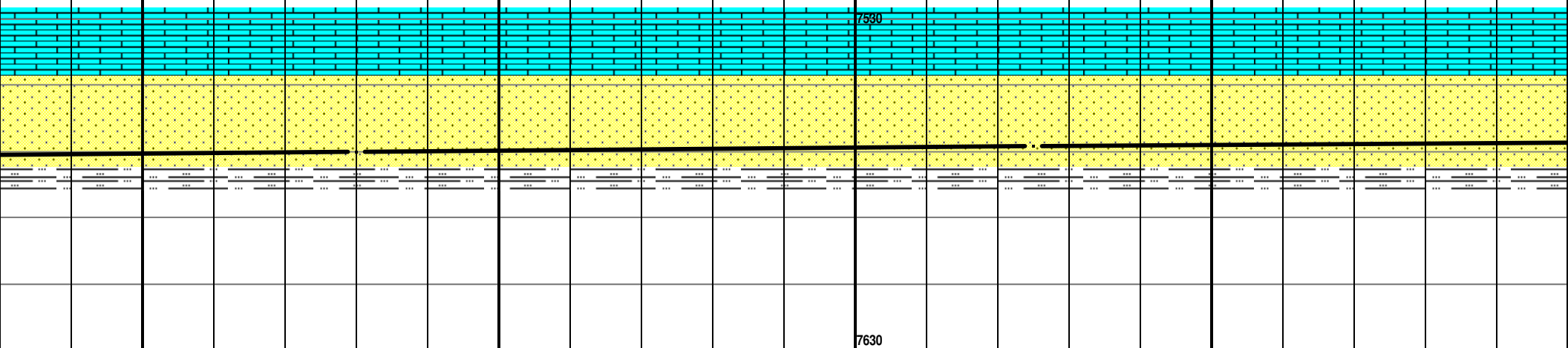
MD 9930 TVD 7570.26  
INC 91.14 AZ 0.59  
VS 2360.59

7430 TVD

MD 10025 TVD 7568.28  
INC 91.24 AZ 0.52  
VS 2455.56

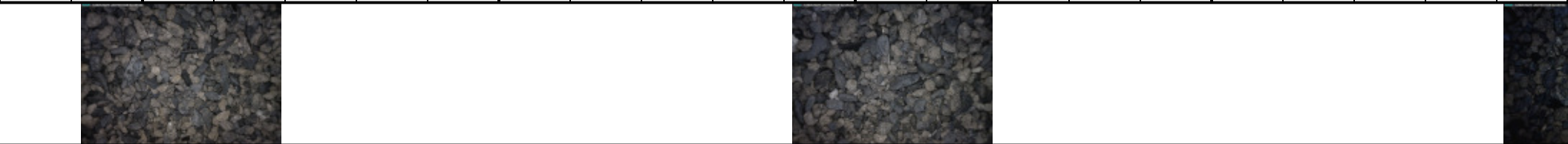
SS (90%): lt brn gy, rr lse clr-trans qrtz grns,  
vfg-fg, sb ang-sb rnd, md-w srt, ply-md cmtd,  
abun silic cmt, non-sl calc, 10-12% est vis por,  
NF, fst good wh cldy cut, good blue-wh resid  
ring; SH: (10%) v dk gy-blk, frm, pty, fiss, sb  
wxy-wxy, n slty, sl carb.

SS (90%): lt brn gy, rr lse clr-trans qrtz grns,  
vfg-fg, sb ang-sb rnd, md-w srt, ply-md cmtd,  
abun silic cmt, non-sl calc, 10-12% est vis por,  
NF, fst good wh blooming cut, good blue-whi  
resid ring; SH: (10%) v dk gy-blk, frm, pty, fiss,  
sb wxy-wxy, n slty, sl carb.

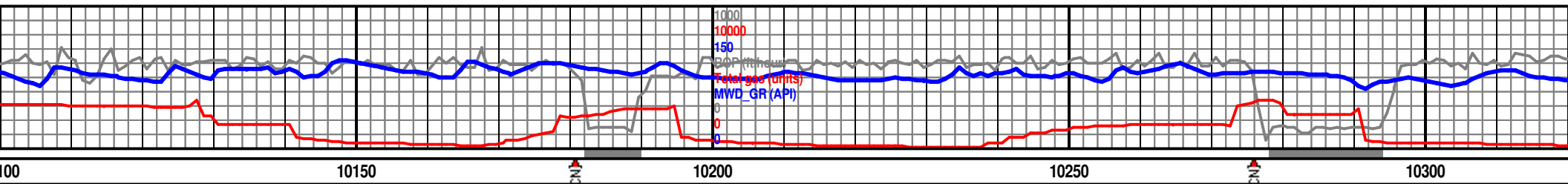


7530

7630

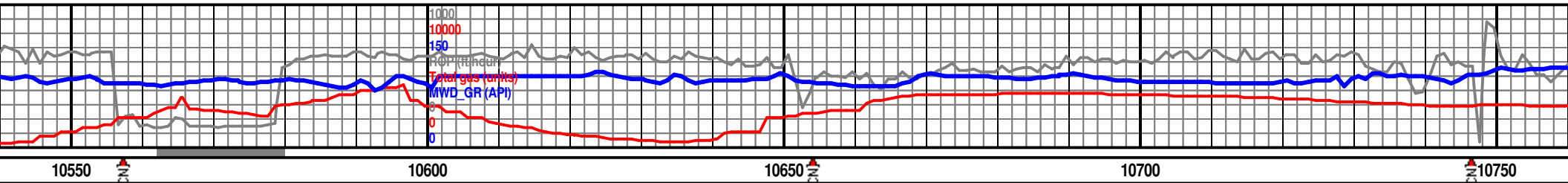


10000  
10000  
10000 (units)  
0.1 (units)  
0.2 (units)  
0.3 (units)  
0.4 (units)  
0

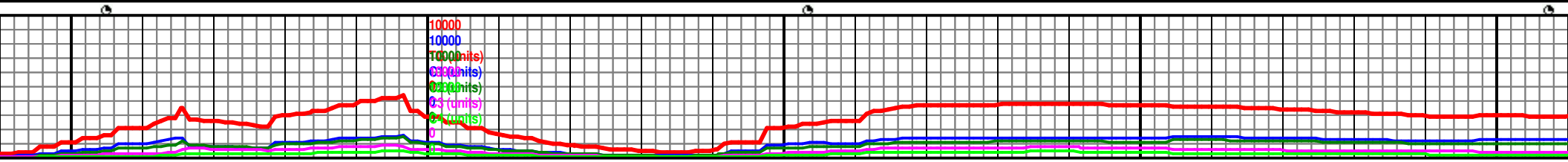


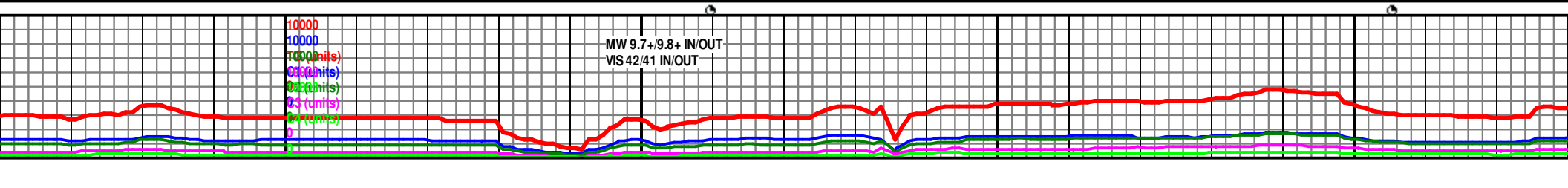
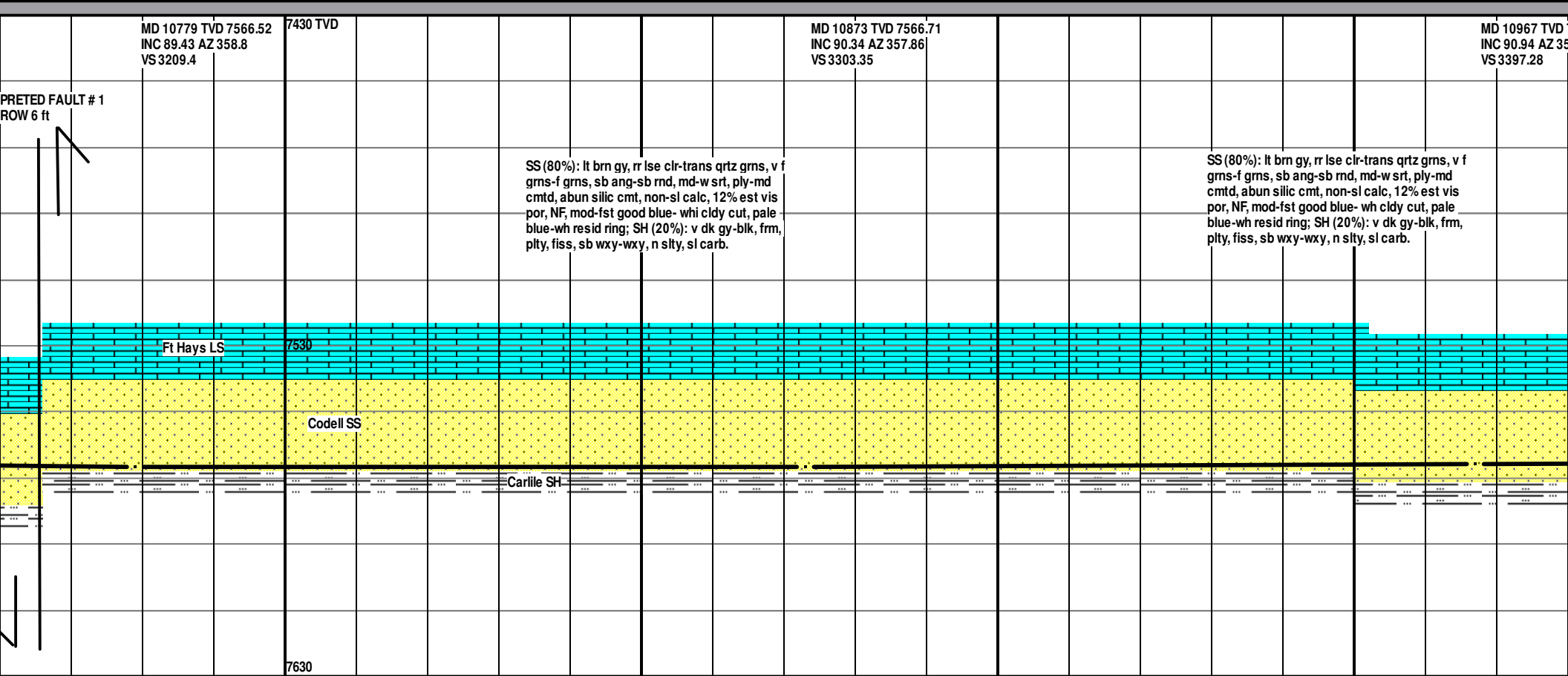
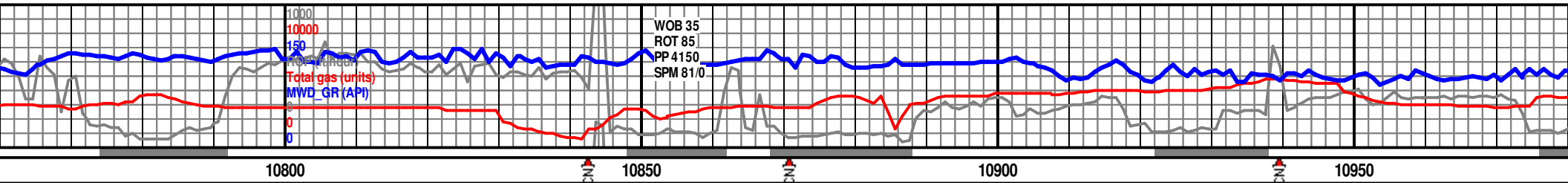
MD 10119 TVD 7566.91 INC 90.44 AZ 359.84 VS 2549.55								7430 TVD				MD 10213 TVD 7565.61 INC 91.14 AZ 359.54 VS 2643.54												MD 10307 TVD 7565.61 INC 90.34 AZ 359.54 VS 2737.53			
				</																							

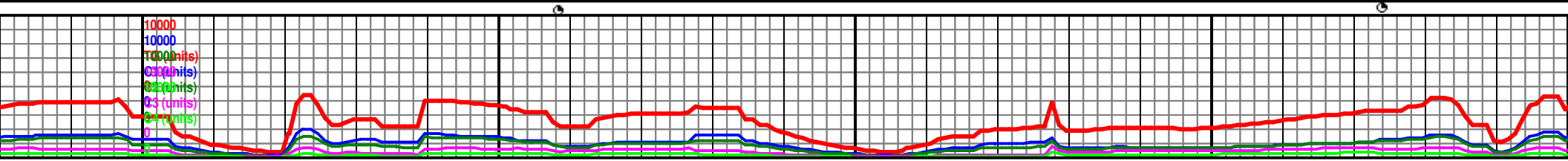
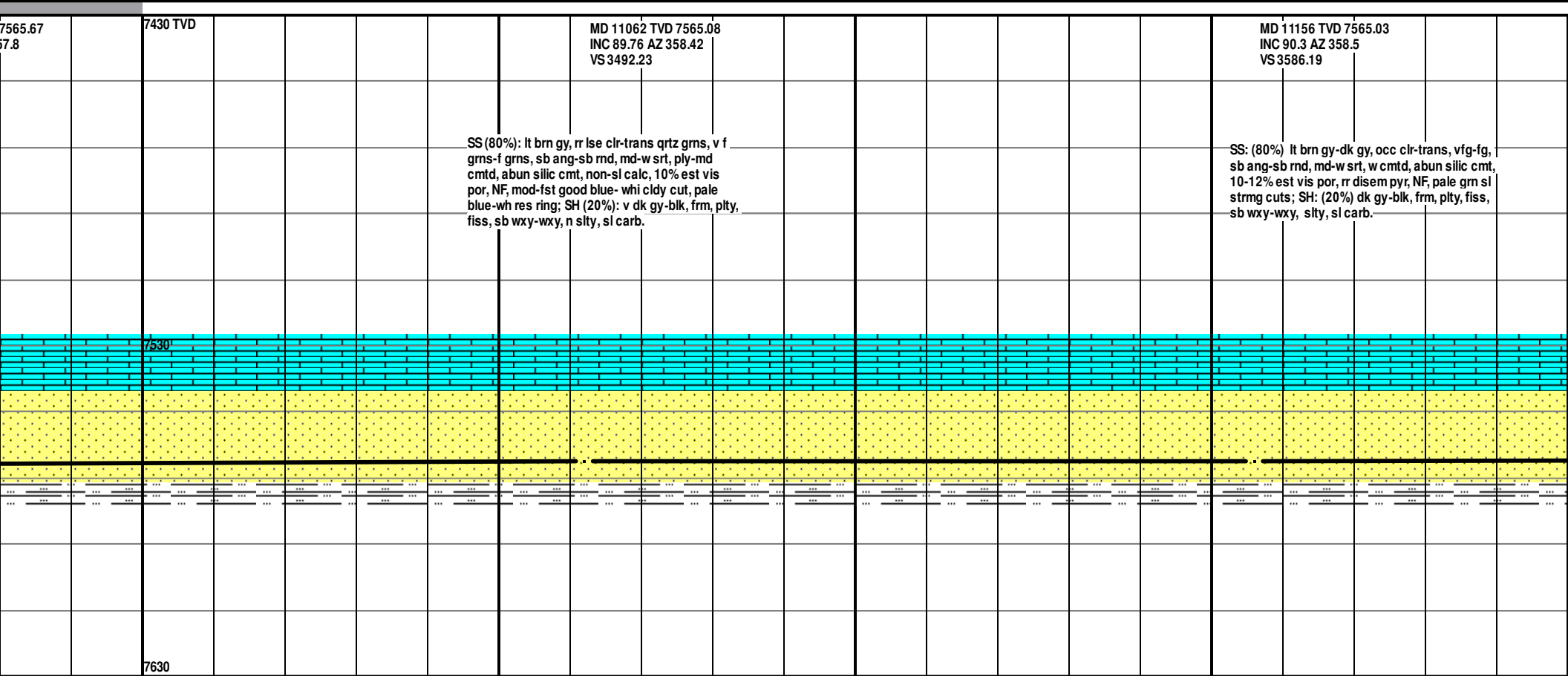


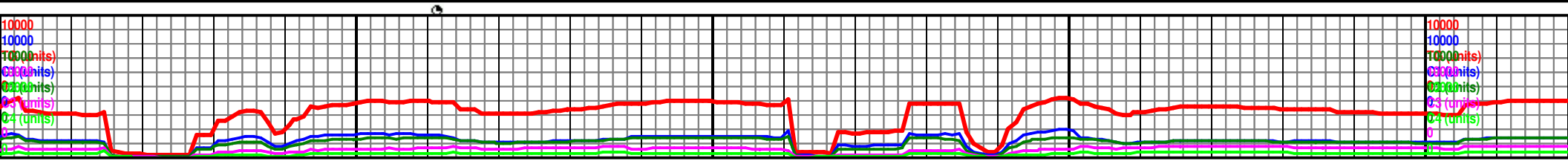
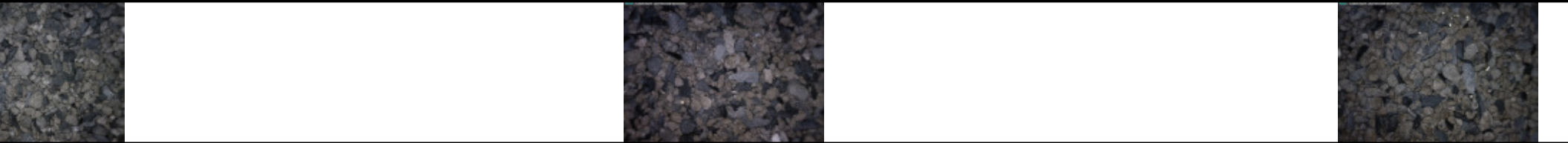
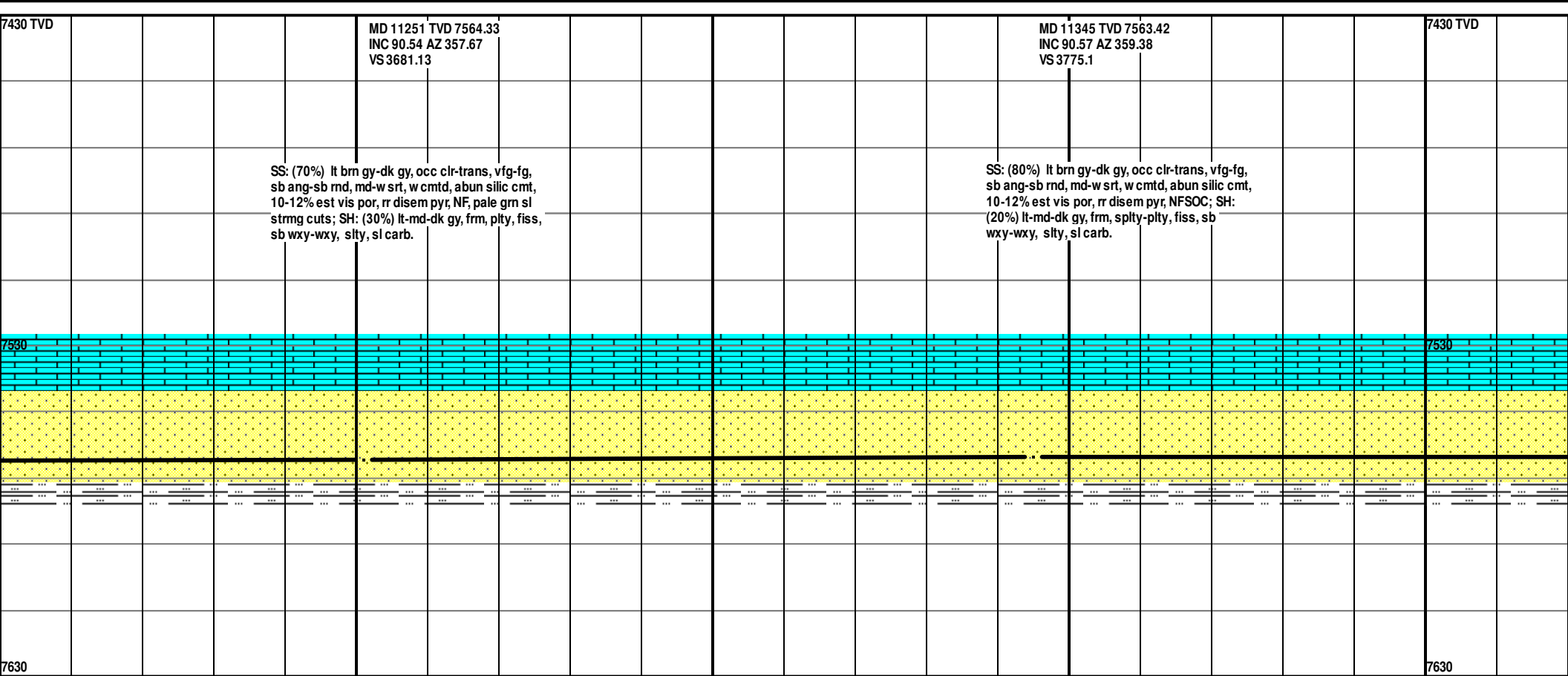
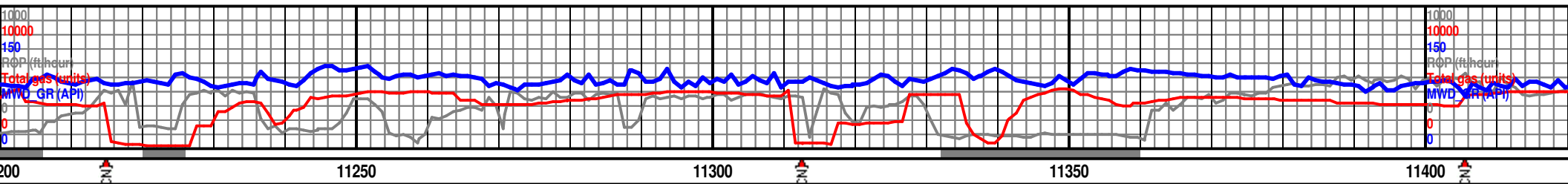


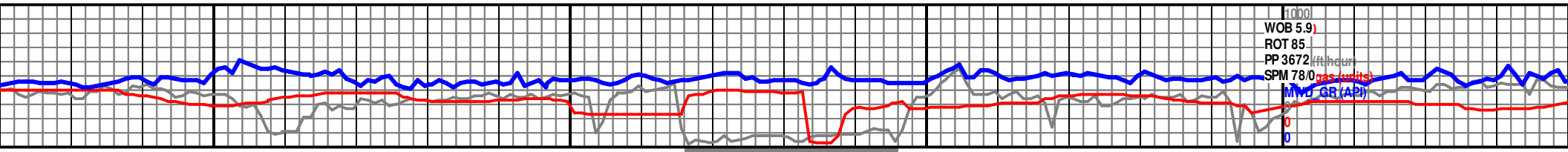
MD 10590 TVD 7561.92 INC 88.55 AZ 0.43 VS 3020.46										MD 10684 TVD 7564.57 INC 88.22 AZ 0.16 VS 3114.42										INTER UP TH									
SS (90%): lt brn gy, rr lse clr-trans qrtz grns, v f grns-f grns, sb ang-sb rnd, md-w srt, ply-md cmt, abun silic cmt, non-sl calc, 12% est vis por, NF, fst bri whi cldy cut, pale blue-wh res ring; SH (10%) v dk gy-blk, frm, plty, fiss, sb wxy-wxy, n slty, sl carb.										SS (90%): lt brn gy, rr lse clr-trans qrtz grns, v f grns-f grns, sb ang-sb rnd, md-w srt, ply-md cmt, abun silic cmt, non-sl calc, 12% est vis por, NF, fst bri whi cldy cut, pale blue-whi res ring; SH (10%)v dk gy-blk, frm, plty, fiss, sb wxy-wxy, n slty, sl carb.										SS (80%): lt brn gy, rr lse clr-trans qrtz grns, v f grns-f grns, sb ang-sb rnd, md-w srt, ply-md cmt, abun silic cmt, non-sl calc, 10% est vis por, NF, mod-fst good blue- whi cldy cut, pale blue-whi res ring; SH (20%): v dk gy-blk, frm, plty, fiss, sb wxy-wxy, n slty, sl carb.									
7530																													
7630																													











11450

11500

11550

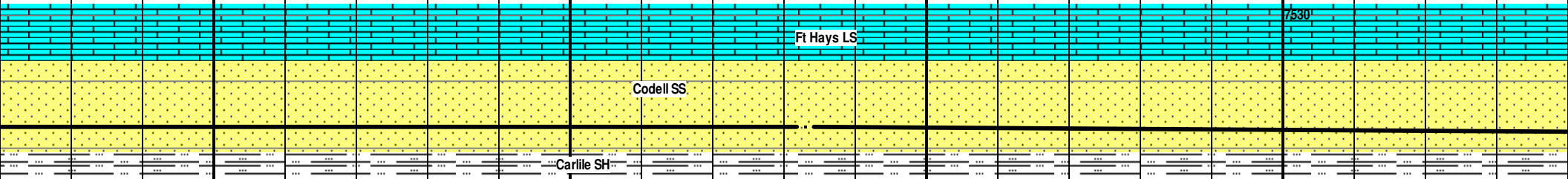
11600

MD 11533 TVD 7563.58  
INC 89.33 AZ 1.18  
VS 3963.08

7430 TVD

SS: (80%) lt brn gy-dk gy, rr clr-trans, vfg-fg, sb  
ang-sb md, md-w srt, w cmt, abun silic cmt,  
10-12% est vis por, NF pale grn-yel sl strmg  
cuts; SH: (20%) gy-dk gy, frm, plty-splty, fiss, sb  
wxy-wxy, slty, sl carb.

SS: (80%) lt brn gy-dk gy, rr clr-trans, vfg-fg, sb  
ang-sb md, md-w srt, w cmt, abun silic cmt,  
10-12% est vis por, NF, wk grn-yel sl strmg resid  
cut; SH: (20%) gy-dk gy, frm, plty-splty, fiss, sb  
wxy-wxy, slty, sl carb.



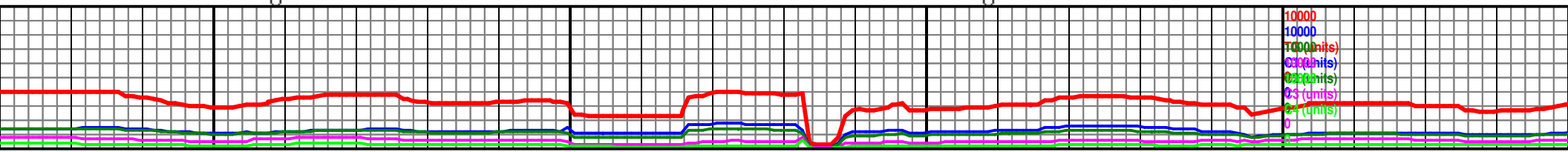
Ft Hays LS

Codell SS

Carlile SH

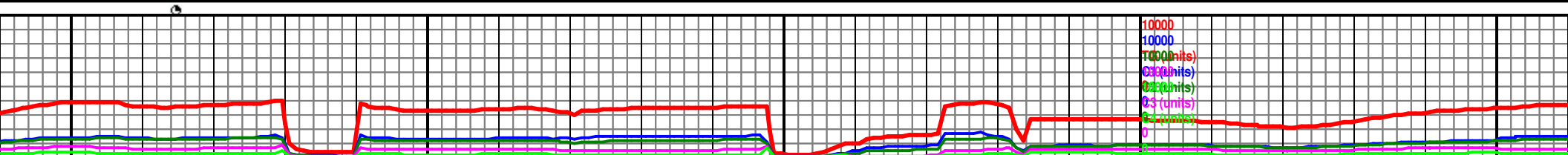
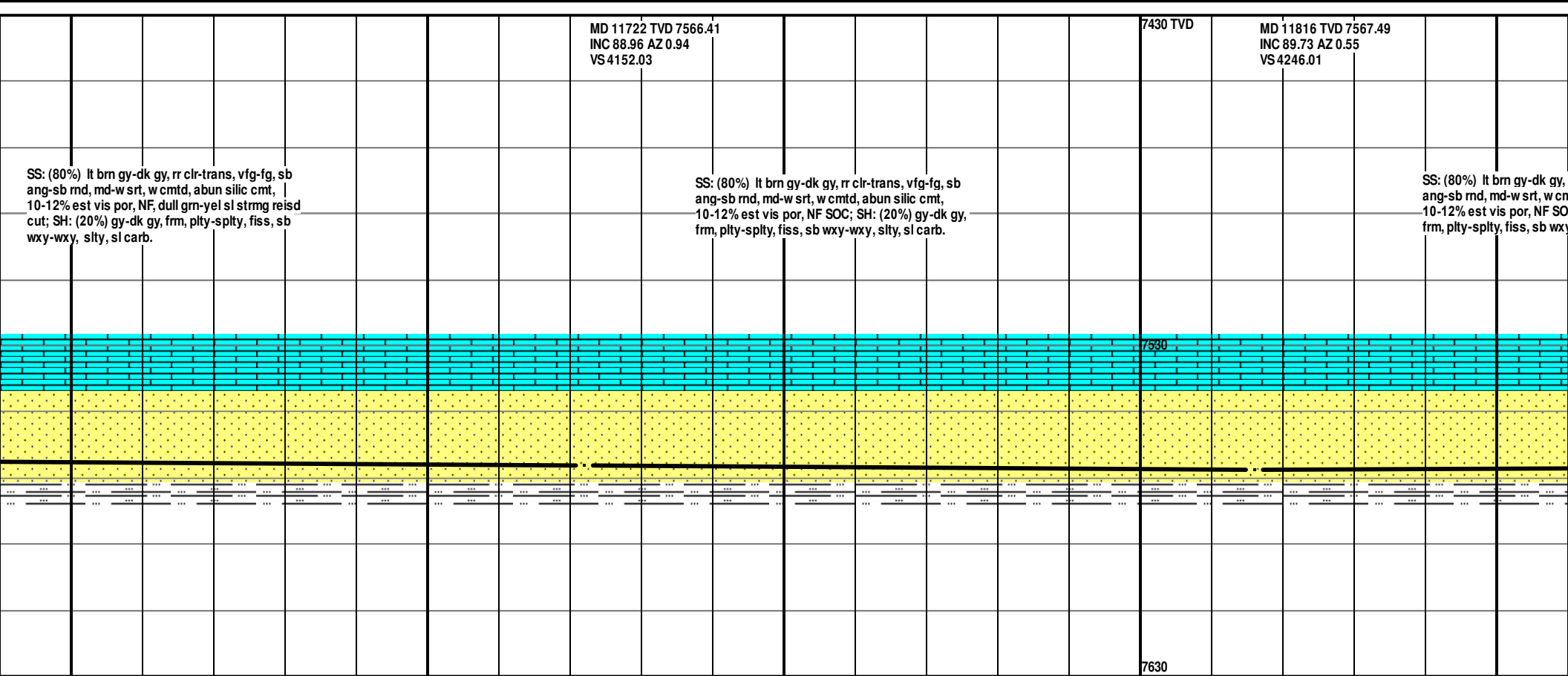
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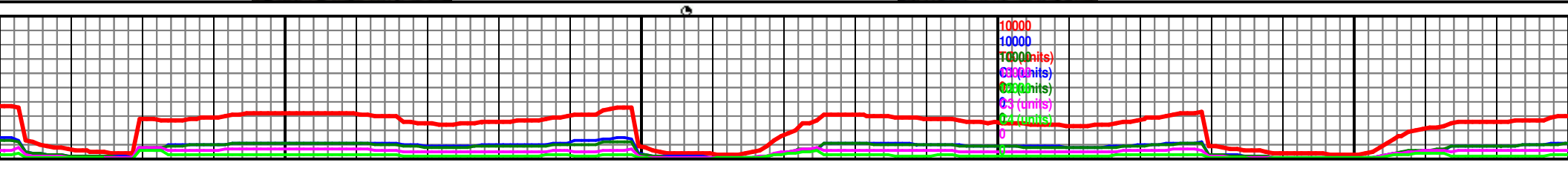
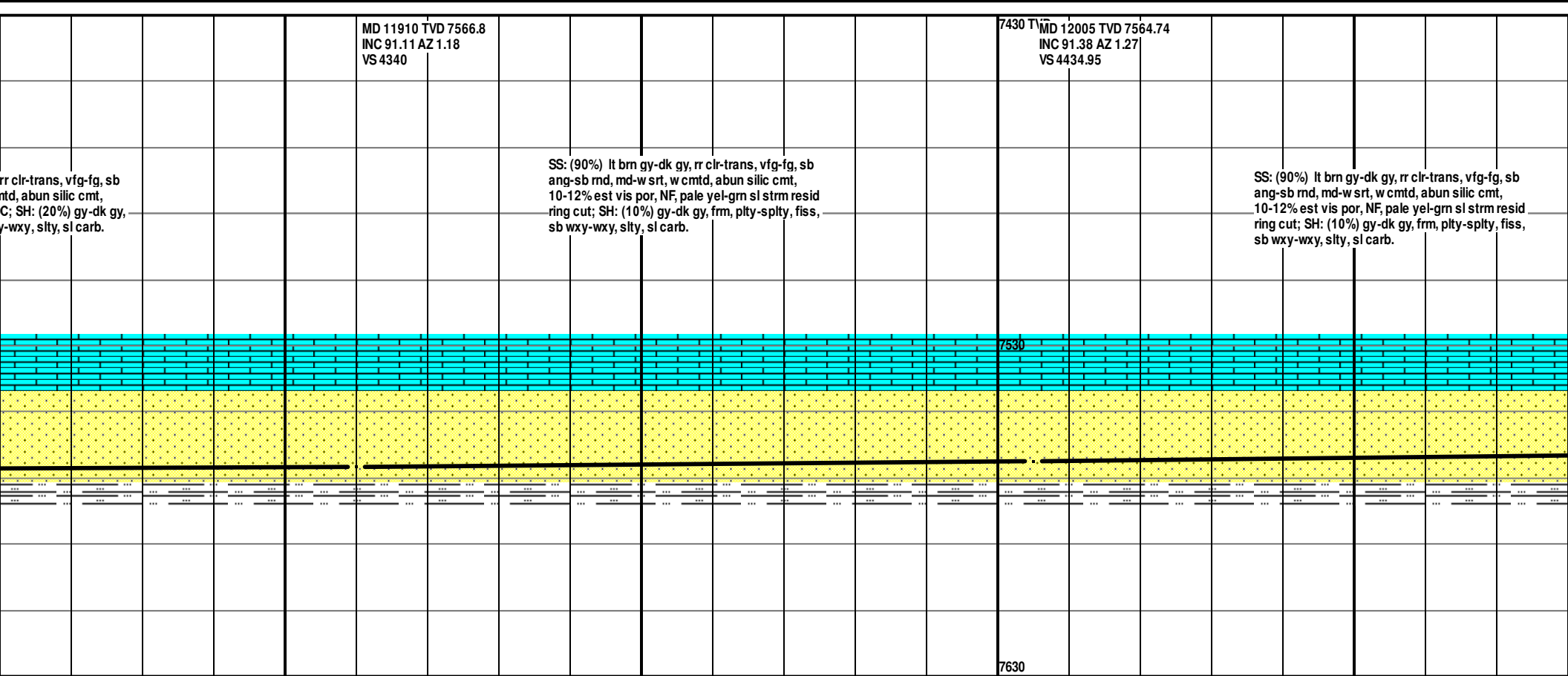
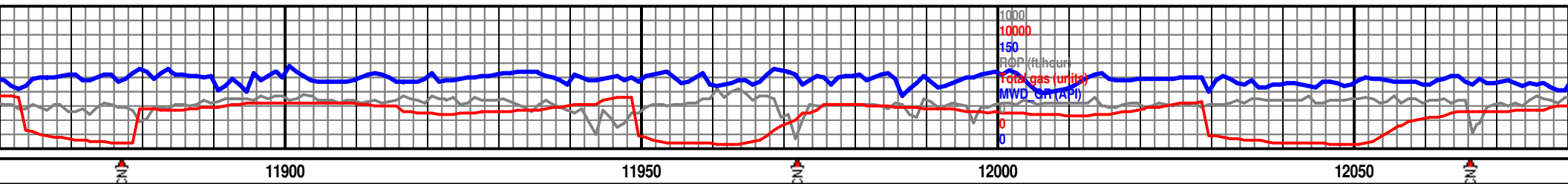
7630

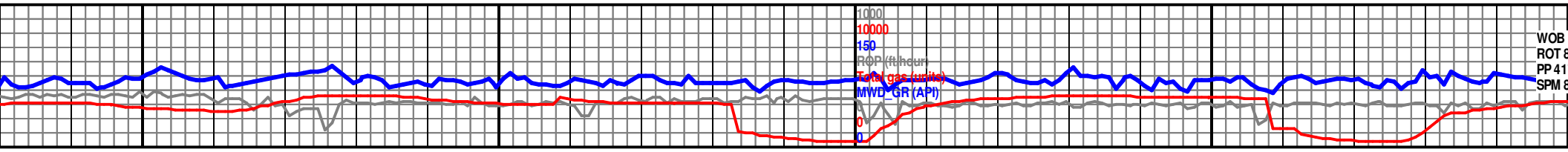


10000  
10000  
10000  
0.1  
0.1  
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0.1  
0.1  
0.1  
0.1









12100

12150

12200

12250

12280

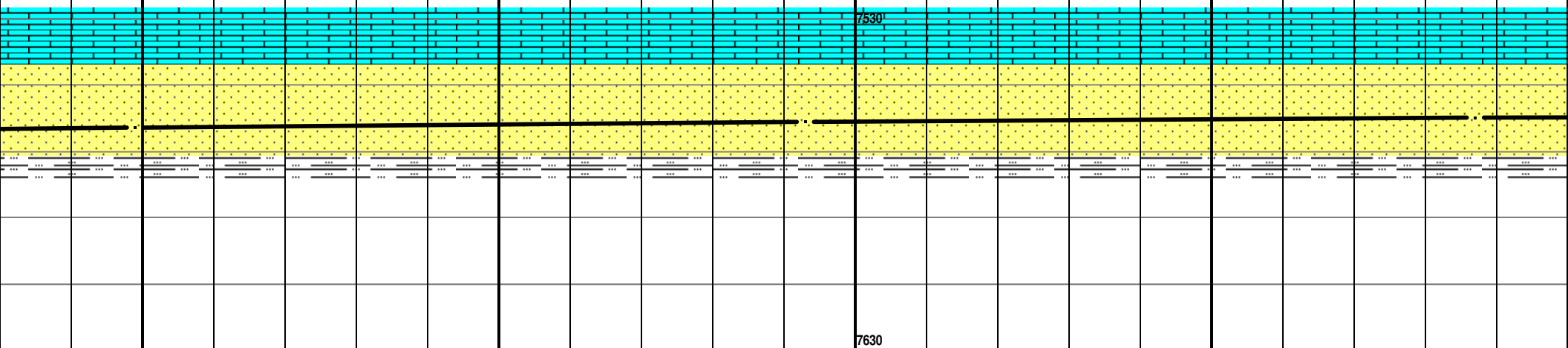
MD 12099 TVD 7562.61  
INC 91.21 AZ 1.28  
VS 4528.9

MD 12193 TVD 7560.98  
INC 90.77 AZ 1.24  
VS 4622.87

MD 12287 TVD 7560.98  
INC 90.77 AZ 1.24  
VS 4716.83

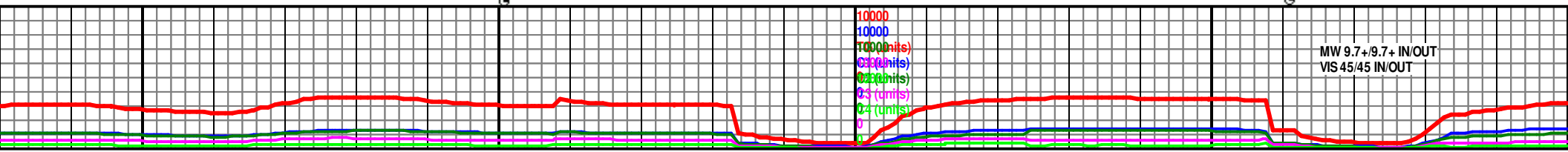
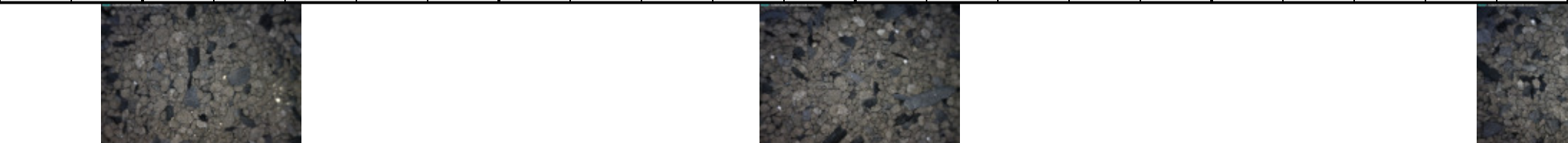
SS: (90%) lt brn gy-dk gy, rr clr-trans, vfg-fg, sb  
ang-sb rnd, md-w srt, w cmt, abun silic cmt,  
10-12% est vis por, NF, pale yel-grn sl strm resid  
ring cut; SH: (10%) gy-dk gy, frm, plty-splty, fiss,  
sb wxy-wxy, slty, sl carb.

SS: (90%) lt brn gy-dk gy, rr clr-trans, vfg-fg, sb  
ang-sb rnd, md-w srt, w cmt, abun silic cmt,  
10-12% est vis por, occ lse disem pyr, NF, pale  
yel-grn sl strm resid ring cut; SH: (10%) gy-dk  
gry, frm-hd, plty-splty, wxy-rthy, sl slty.



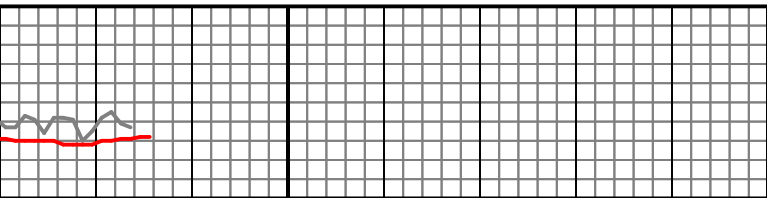
7530'

7630



MW 9.7+/9.7+ IN/OUT  
VIS 45/45 IN/OUT





MD 12534 TVD 7560.6  
INC 89.56 AZ 1.32  
VS 4967.1

TD 12534' MD @ 13:55 hours, 07/29/2014

(GOOLSBY BROTHERS & ASSOCIATES)



Projection to bit

4.5" production liner set and cemented at  
12527' ,WT: 11.6 ppf; Grade: HCP110 on July 31,  
2014.

