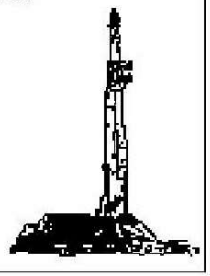
GOOLSBY BROTHERS
and associates, inc.
575 Union Blvd, Suite 208
Lakewood, CO 80228
303-945-2860 Office
Geological Wellsite
Supervision
www.goolsbybrothers.com



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

Well Name:	**Harvesters State 4C-16-M**
API:	**051234637200**
Location:	**Section 15, T6N, R66W, Weld County, CO.**
License Number:	
Region:	**Wattenberg**
Spud Date:	**April 19, 2018**
Drilling Completed:	**April 22, 2018**
Surface Coordinates:	**SWNE T6N, R66W Sec 15, 1,633' FNL & 2,333' FEL**
	LAT 40.2928036 LONG -104.4545025
Bottom Hole Coordinates:	**NWNW T6N, R66W Sec 16, 548' FNL & 115' FWL**
Ground Elevation (ft):	**4,803'**
K.B. Elevation (ft):	**4,823'**
Logged Interval (ft):	**7,000' To: 15,218'**
Total Depth (ft):	**15,218' DMTD**
Formation:	**Pierre Shales / Sands, Sharon Springs, Niobrara, Codell (Target)**
Type of Drilling Fluid:	**FW Surface, OBM Curve & Lateral**

OPERATOR

Company: SRC Energy Inc.
Address: 1675 Broadway, Suite 2600
Denver, Colorado 80202
(720) 616-4300

GEOLOGIST

Name: Larry Goolsby & Brian Spitzmiller
Company: Goolsby Brothers & Assoc. (GBA), Inc. (www.goolsbybrothers.com)
Address: 575 Union Blvd. Suite 208,
Lakewood CO. 80228
Tel 303-618-7736

Logs

PULSE MWD GR from 1,818'-15,205' MD

Casing

9 5/8" Surface Casing set @ 1,802' MD
5 1/2" Production Casing set @ 15,205' MD

Comments

1) Drilling Contractor: Precision Drilling, Rig #462
Toolpusher: Cody Teeter, Joseph Credeur

2) Company Man: Steve Wilson, Buddy Davis
Lovell Young, Tony Pershall

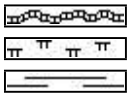
3) Mud Company : Anchor USA
Engineer: Tim Pattison, James Eckhardt

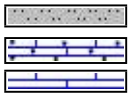
4) Directional Drilling: Baker Hughes Directional
Rotary Steerable BHA
Drillers: Dustin Tissaw, Matthew Leopold

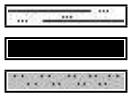
5) Gas Equipment: Pason Gas Analyzer (Spectrometer)

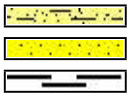
6) SRC Geologist: Tony Williams

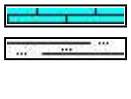
ROCK TYPES


Bent
Mrlst
Shale


Sltst
Carb chalk
Chalk


Slty sh
Coal
Sltst


Arg_ss
Ss
Carb sh


Ls
Slty sh

ACCESSORIES

MINERAL

- Anhy
- Arggrn
- Arg
- Bent
- Bit
- Brecfrag
- Calc
- Carb
- Chtdk
- Chtlt
- 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

POROSITY TYPE

- Earthy
- Fenest
- Fracture
- Inter
- Moldic
- Organic
- Pinpoint
- Vuggy

SORTING

- Well
- Moderate
- Poor

ROUNDING

- Rounded
- Subrnd
- Subang
- Angular

OIL SHOWS

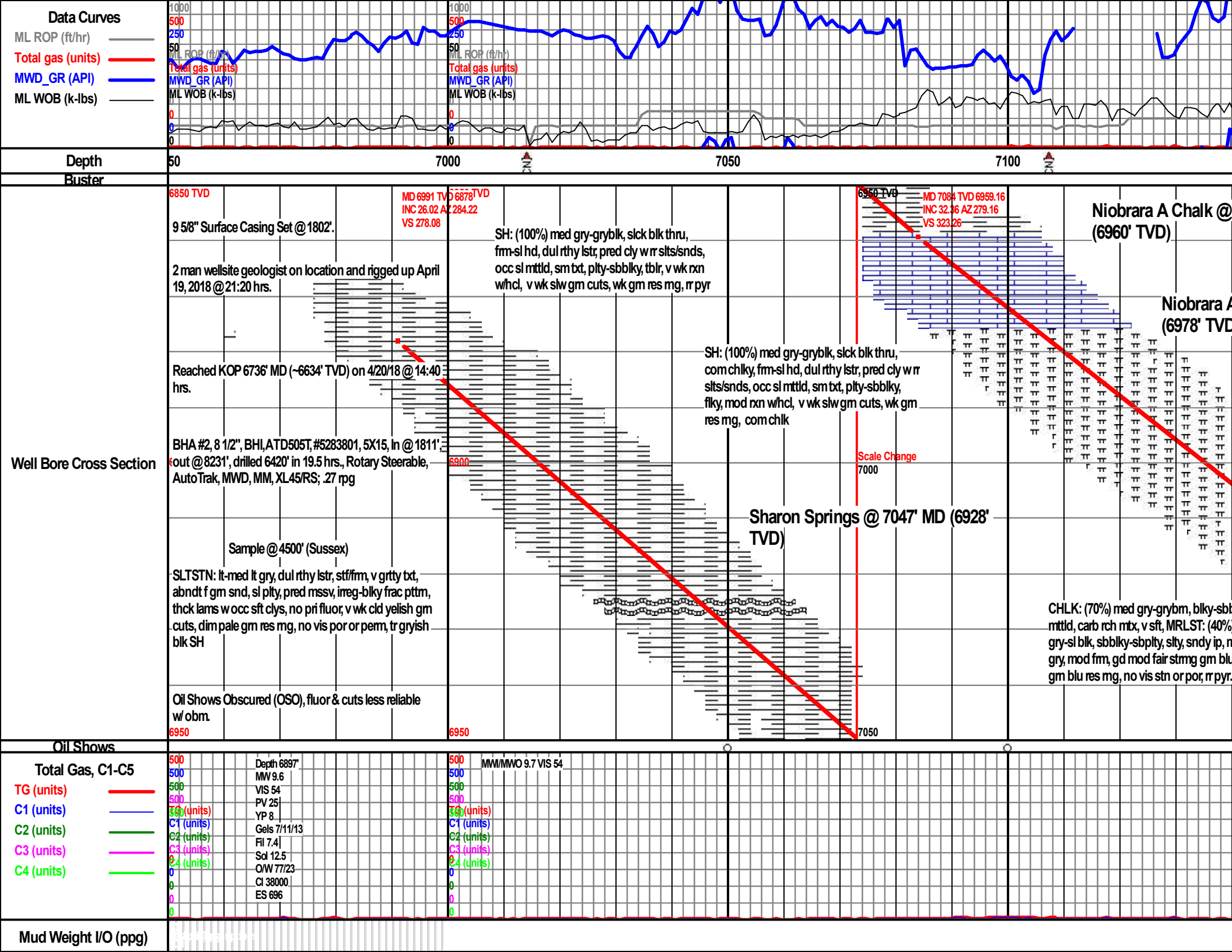
- Even
- Spotted
- Ques
- Dead
- Vspotty
- near even

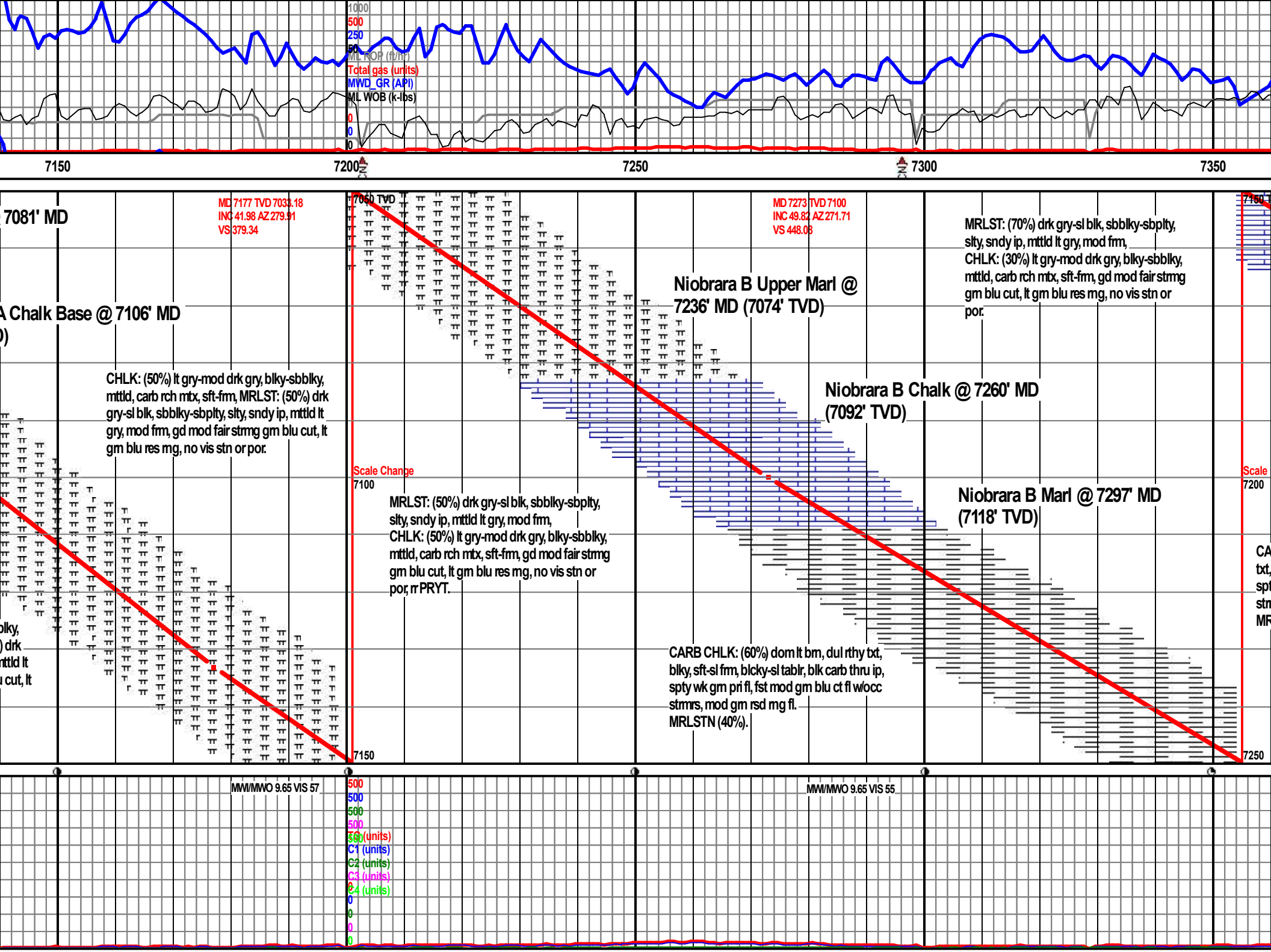
INTERVALS

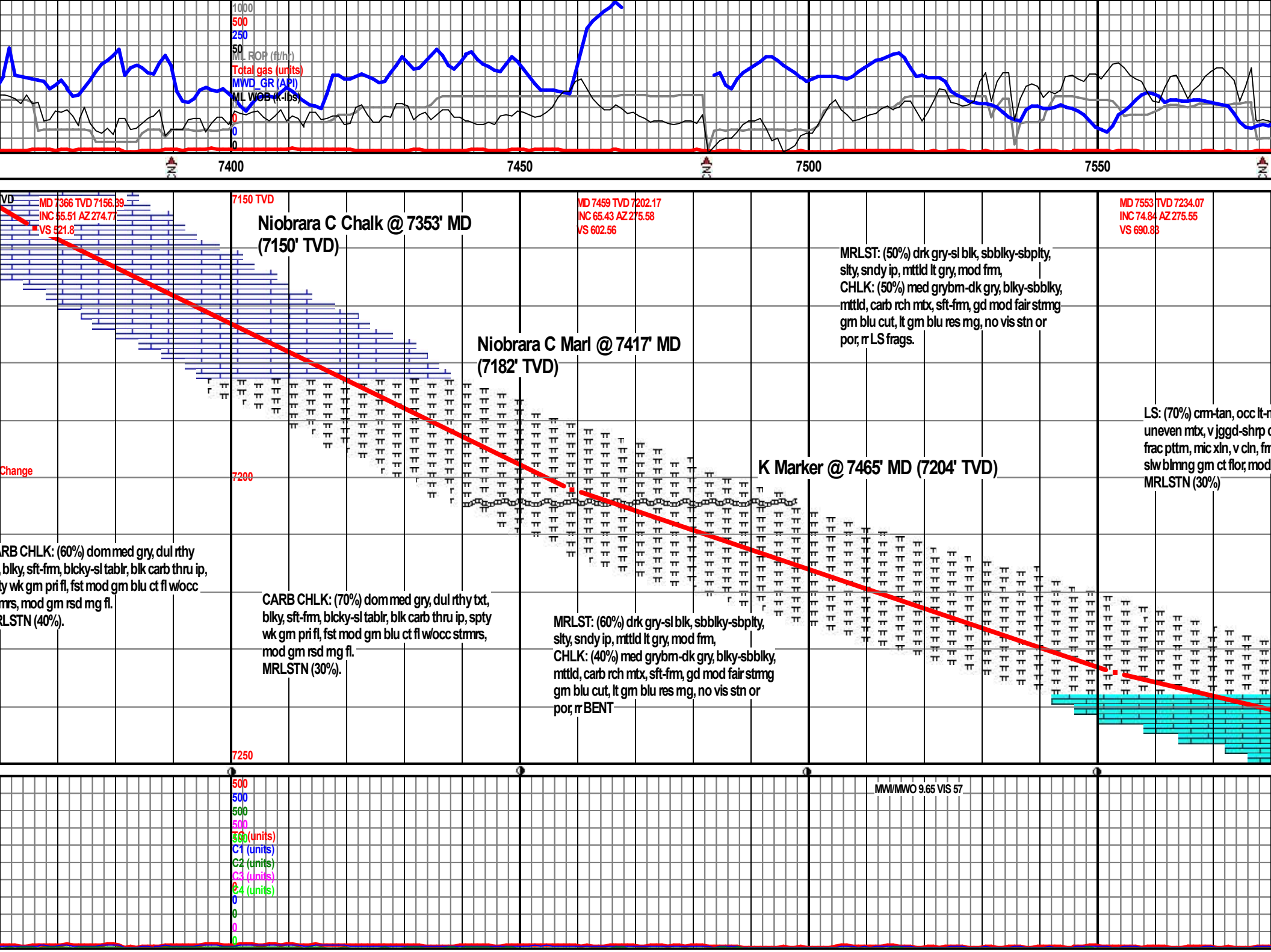
- Core
- Dst

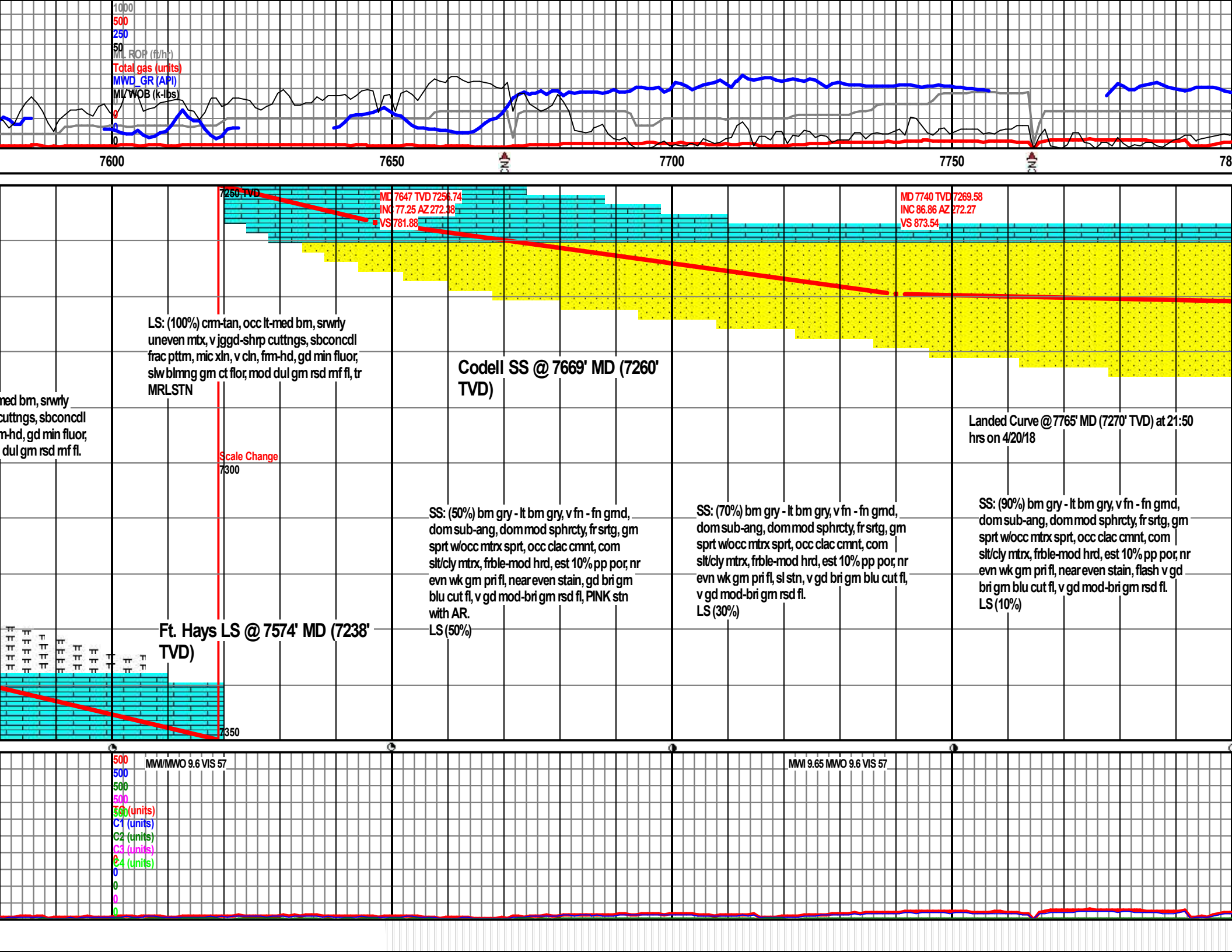
EVENTS

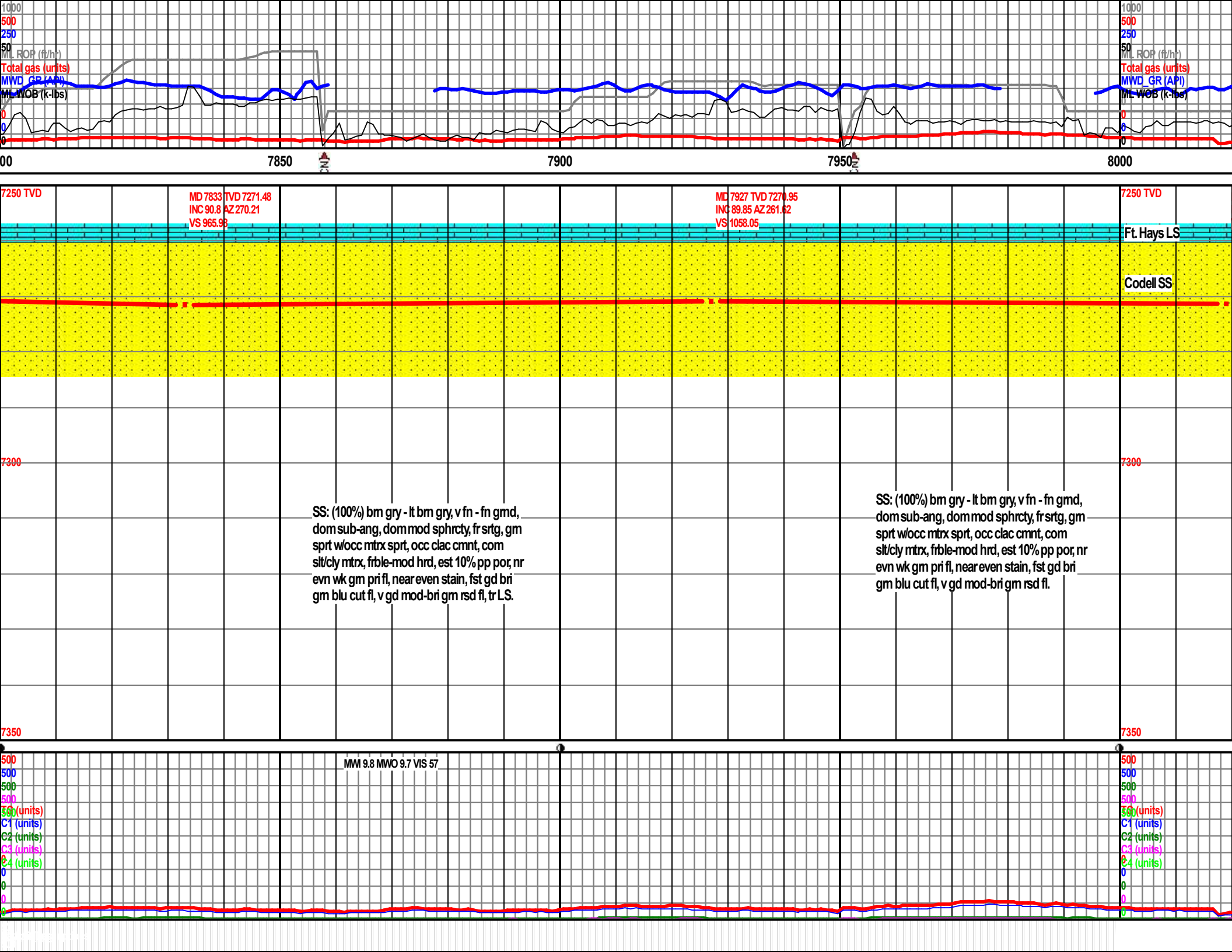
- Casing shoe_hzl
- Trip_point_1
- Off bottom
- conn
- Survey(mwd)
- Survey(red)
- bit

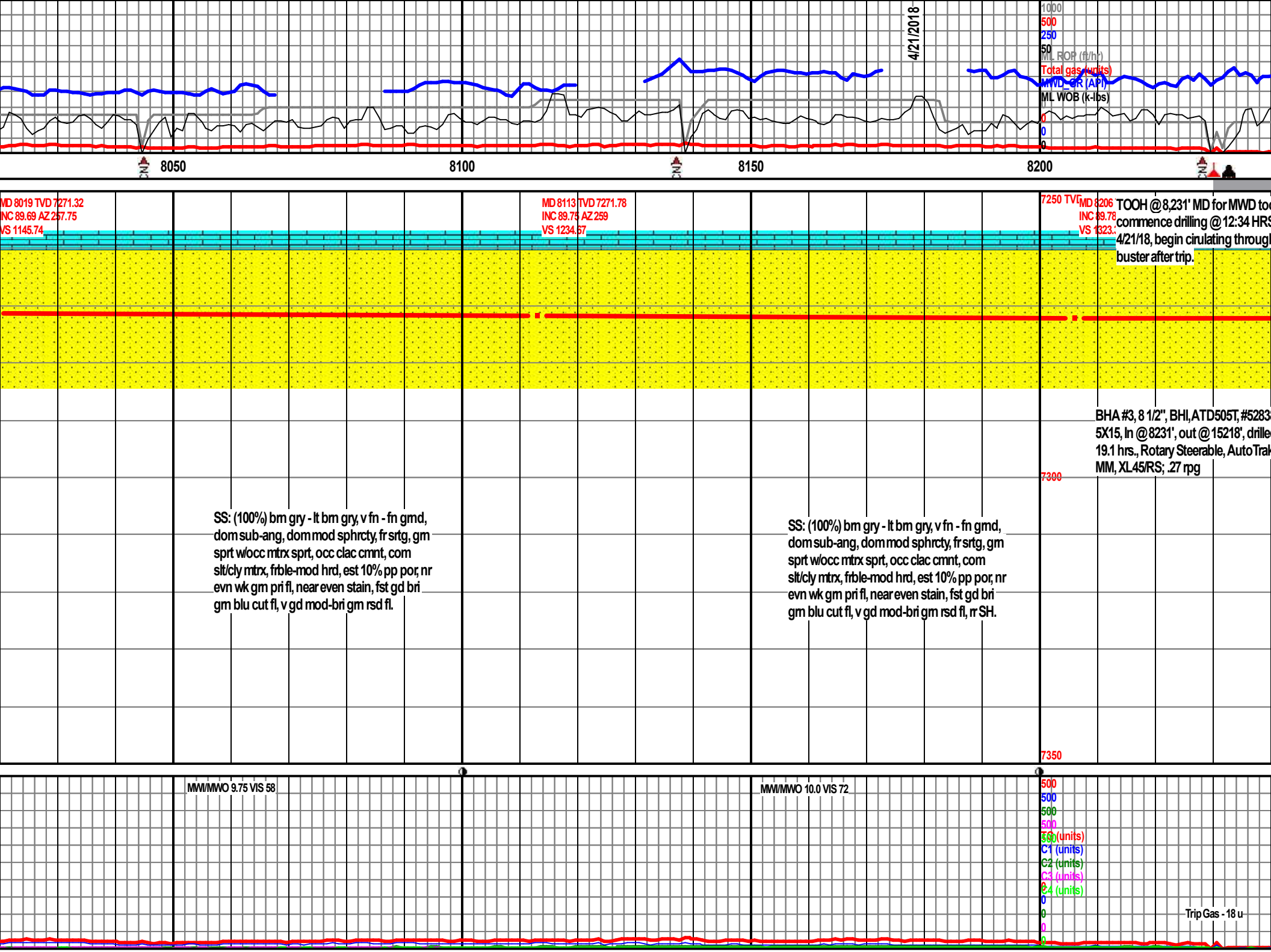

Data Curves
ML ROP (ft/hr)
Total gas (units)
MWD_GR (API)
ML WOB (k-lbs)
1000
500
250
50
0
Depth
50
7000
7050
7100
Buster
Well Bore Cross Section
6850 TVD
MD 6991 TVD 6878 TVD
INC 26.02 AZ 284.22
VS 278.08
9 5/8" Surface Casing Set @ 1802'.
2 man wellsite geologist on location and rigged up April 19, 2018 @ 21:20 hrs.
Reached KOP 6736' MD (~6634' TVD) on 4/20/18 @ 14:40 hrs.
BHA #2, 8 1/2", BHI,ATD505T,#5283801, 5X15, in @ 1811', out @ 8231', drilled 6420' in 19.5 hrs., Rotary Steerable, AutoTrak, MWD, MM, XL45/RS; .27 rpg
Sample @ 4500' (Sussex)
SLTSTN: lt-med lt gry, dul rthy lstr, stf/frm, v grtty txt, abndt f gm snd, sl plty, pred mssv, irreg-blky frac pttm, thck lams w occ sft clys, no pri fluor, v wk cld yelish gm cuts, dim pale gm res rng, no vis por or perm, tr gryish blk SH
Oil Shows Obscured (OSO), fluor & cuts less reliable w/ obm.
6950
SH: (100%) med gry-gryblk, slck blk thru, frm-sl hd, dul rthy lstr, pred cly w rr slts/snds, occ sl mttld, sm txt, plty-sbblky, tblr, v wk rxn w/hcl, v wk slw gm cuts, wk gm res rng, rr pyr
6900
6950 TVD
MD 7084 TVD 6959.16
INC 32.36 AZ 279.16
VS 323.26
SH: (100%) med gry-gryblk, slck blk thru, com chlky, frm-sl hd, dul rthy lstr, pred cly w rr slts/snds, occ sl mttld, sm txt, plty-sbblky, flky, mod rxn w/hcl, v wk slw gm cuts, wk gm res rng, com chlk
Scale Change
7000
Sharon Springs @ 7047' MD (6928' TVD)
7050
Niobrara A Chalk @ (6960' TVD)
Niobrara A (6978' TVD
CHLK: (70%) med gry-grybm, blky-sbb mttld, carb rch mtx, v sft, MRLST: (40% gry-sl blk, sbblky-sbplty, slty, sndy ip, n gry, mod frm, gd mod fair strng gm blu gm blu res rng, no vis stn or por, rr pyr.
Oil Shows
Total Gas, C1-C5
TG (units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)
500
0
Depth 6897'
MW 9.6
VIS 54
PV 25
YP 8
Gels 7/11/13
Fil 7.4
Sol 12.5
O/W 77/23
Cl 38000
ES 696
MWI/MWO 9.7 VIS 54
Mud Weight I/O (ppg)

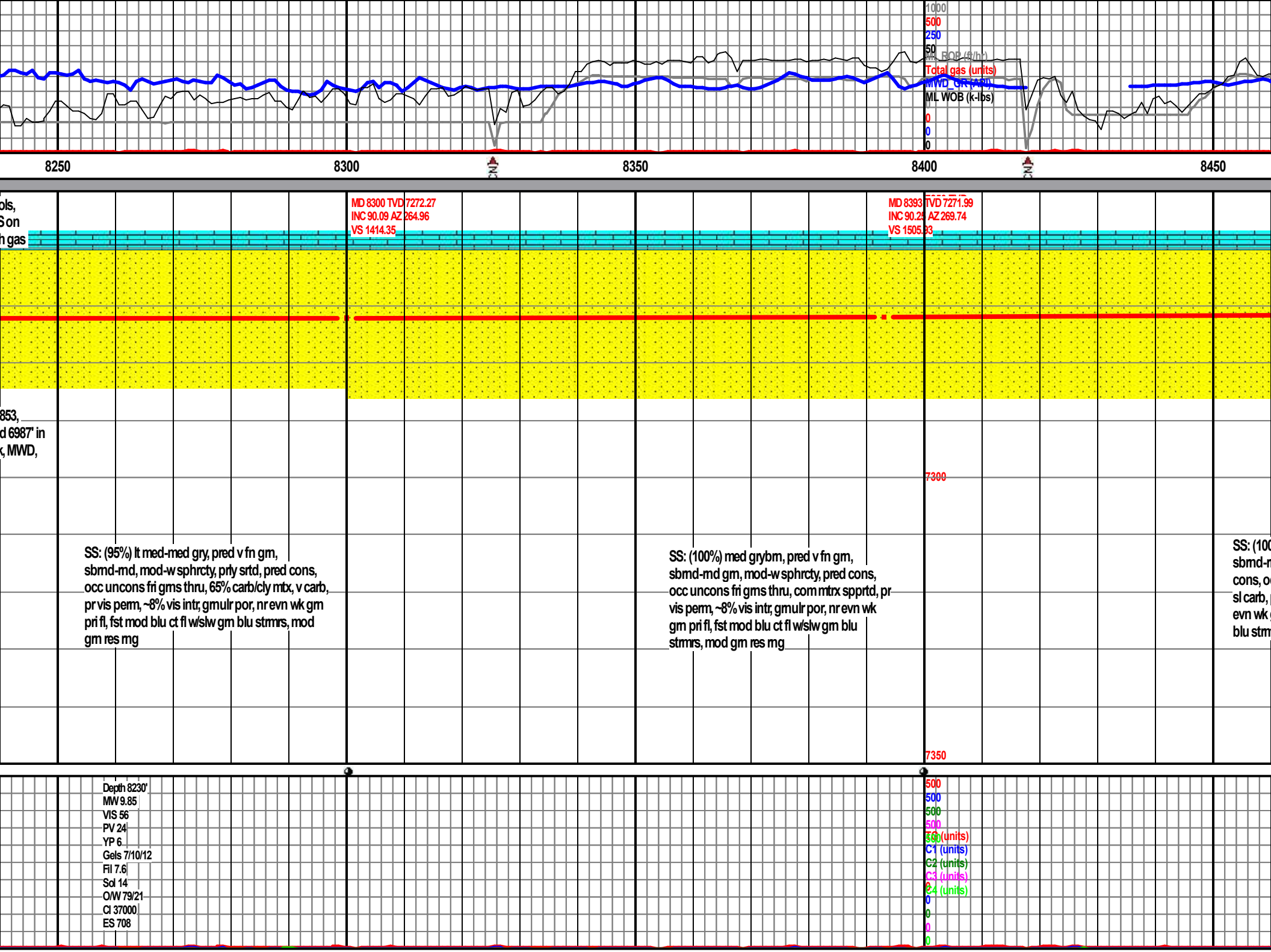

1000
500
250
50
ML ROP (ft/hr)
Total gas (units)
MWD_GR (API)
ML WOB (k-lbs)
0
0
0
7150
7200
7250
7300
7350
7081' MD
A Chalk Base @ 7106' MD
MD 7177 TVD 7033.18
INC 41.98 AZ 279.91
VS 379.34
7060 TVD
CHLK: (50%) lt gry-mod drk gry, blky-sbblky, mttld, carb rch mtx, sft-frm, MRLST: (50%) drk gry-sl blk, sbblky-sbplty, slty, sndy ip, mttld lt gry, mod frm, gd mod fair strmg gm blu cut, lt gm blu res mg, no vis stn or por.
Scale Change
7100
MRLST: (50%) drk gry-sl blk, sbblky-sbplty, slty, sndy ip, mttld lt gry, mod frm, CHLK: (50%) lt gry-mod drk gry, blky-sbblky, mttld, carb rch mtx, sft-frm, gd mod fair strmg gm blu cut, lt gm blu res mg, no vis stn or por, rr PRYT.
7150
Niobrara B Upper Marl @ 7236' MD (7074' TVD)
MD 7273 TVD 7100
INC 49.82 AZ 271.71
VS 448.08
MRLST: (70%) drk gry-sl blk, sbblky-sbplty, slty, sndy ip, mttld lt gry, mod frm, CHLK: (30%) lt gry-mod drk gry, blky-sbblky, mttld, carb rch mtx, sft-frm, gd mod fair strmg gm blu cut, lt gm blu res mg, no vis stn or por.
Niobrara B Chalk @ 7260' MD (7092' TVD)
Niobrara B Marl @ 7297' MD (7118' TVD)
CARB CHLK: (60%) dom lt brn, dul rthy txt, blky, sft-sl frm, blcky-sl tablr, blk carb thru ip, spty wk gm pri fl, fst mod gm blu ct fl w/occ strmrs, mod gm rsd mg fl. MRLSTN (40%).
7250
MW/MWO 9.65 VIS 57
MW/MWO 9.65 VIS 55
500
500
500
C1 (units)
C2 (units)
C3 (units)
C4 (units)
0
0
0
0

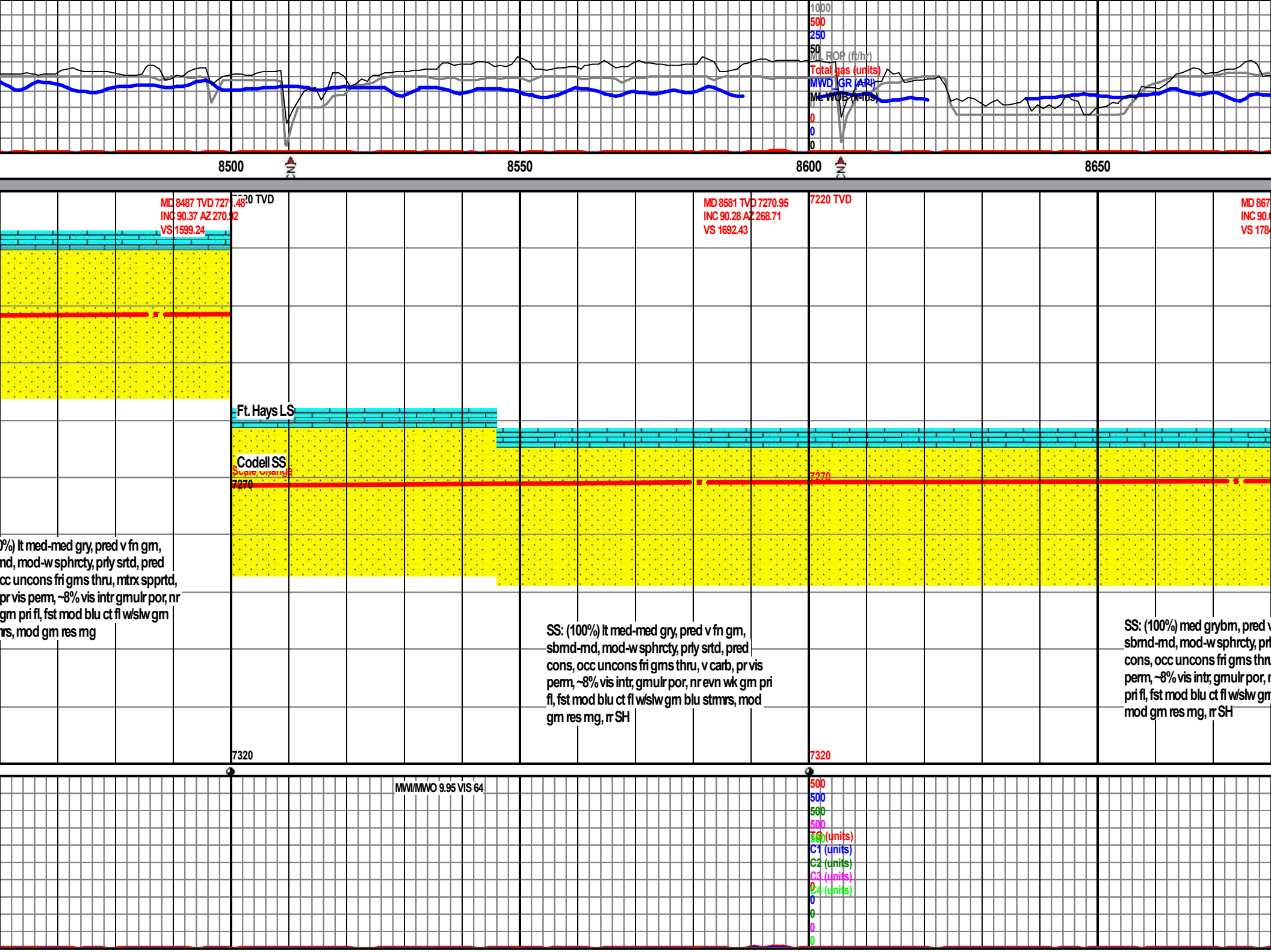

1000
500
250
50
ML ROP (ft/hr)
Total gas (units)
MWD_GR (API)
ML WOB (K-lbs)
0
0
0
7400
7450
7500
7550
MD 7366 TVD 7156.39
INC 55.51 AZ 274.77
VS 521.8
7150 TVD
Niobrara C Chalk @ 7353' MD
(7150' TVD)
MD 7459 TVD 7202.17
INC 65.43 AZ 275.58
VS 602.56
MD 7553 TVD 7234.07
INC 74.84 AZ 275.55
VS 690.83
MRLST: (50%) drk gry-sl blk, sbblky-sbplty,
slty, sndy ip, mttld lt gry, mod frm,
CHLK: (50%) med grybm-dk gry, blky-sbblky,
mttld, carb rch mtx, sft-frm, gd mod fair strmg
gm blu cut, lt gm blu res mg, no vis stn or
por, rr LS frags.
Niobrara C Marl @ 7417' MD
(7182' TVD)
K Marker @ 7465' MD (7204' TVD)
LS: (70%) crm-tan, occ lt-
uneven mtx, v jggd-shrp
frac pttm, mic xln, v cln, fr
slw blmng gm ct flor, mod
MRLSTN (30%)
Change
7200
RB CHLK: (60%) dom med gry, dul rthy
blky, sft-frm, blcky-sl tablr, blk carb thru ip,
y wk gm pri fl, fst mod gm blu ct fl w/occ
mrs, mod gm rsd mg fl.
RLSTN (40%).
CARB CHLK: (70%) dom med gry, dul rthy txt,
blky, sft-frm, blcky-sl tablr, blk carb thru ip, spty
wk gm pri fl, fst mod gm blu ct fl w/occ stmrs,
mod gm rsd mg fl.
MRLSTN (30%).
MRLST: (60%) drk gry-sl blk, sbblky-sbplty,
slty, sndy ip, mttld lt gry, mod frm,
CHLK: (40%) med grybm-dk gry, blky-sbblky,
mttld, carb rch mtx, sft-frm, gd mod fair strmg
gm blu cut, lt gm blu res mg, no vis stn or
por, rr BENT
7250
500
500
500
500
(units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)
0
0
0
0
MW/MWO 9.65 VIS 57

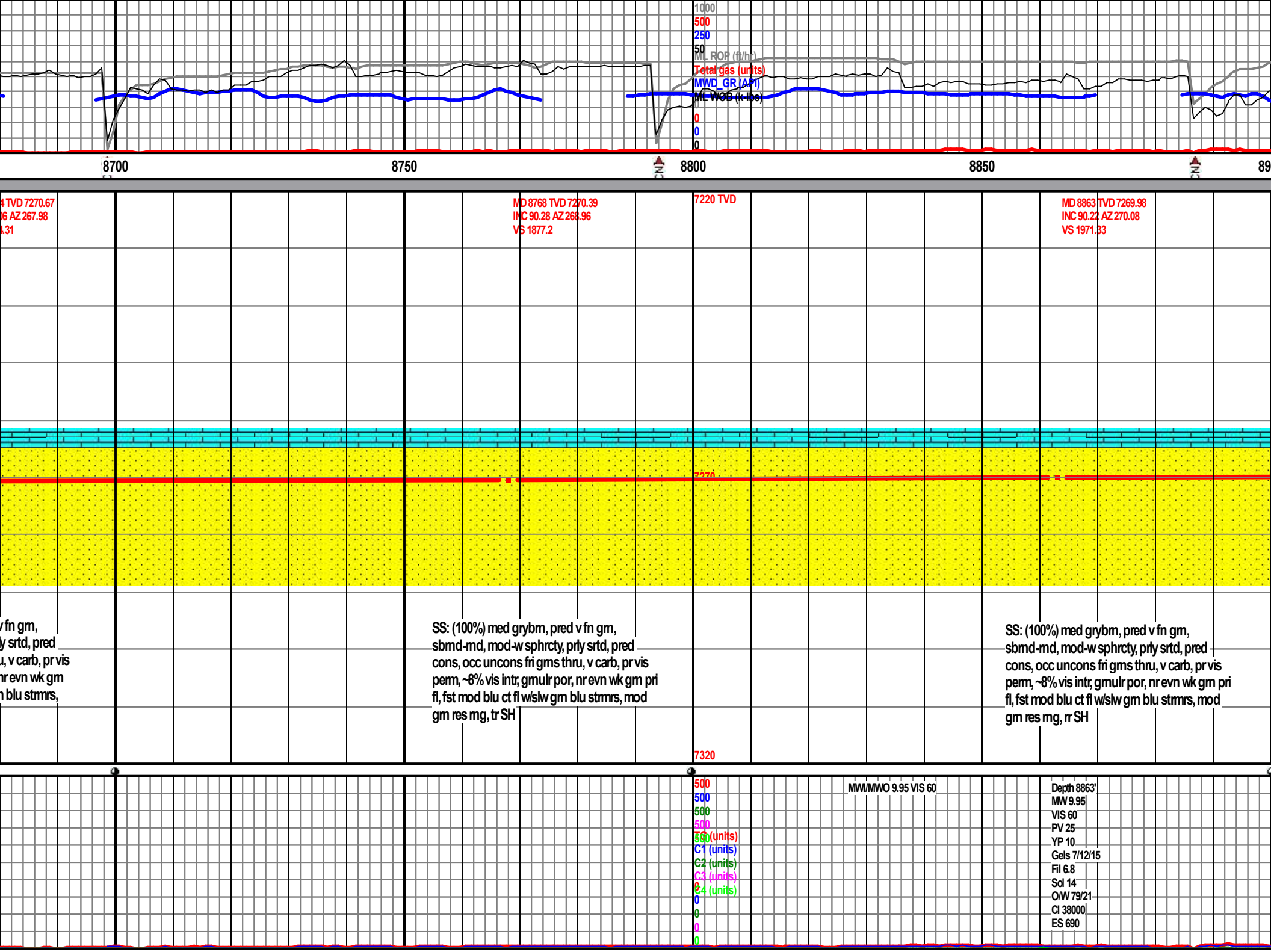

1000
500
250
50
ML ROP (ft/h')
Total gas (units)
MWD_GR (API)
ML WOB (k-lbs)
0
0
0
7600
7650
7700
7750
7250 TVD
MD 7647 TVD 7256.74
INC 77.25 AZ 272.38
VS 781.88
MD 7740 TVD 7269.58
INC 86.86 AZ 272.27
VS 873.54
LS: (100%) crm-tan, occ lt-med brn, srwrly uneven mtx, v jggd-shrp cuttngs, sbconcdl frac pttrn, mic xln, v cln, frm-hd, gd min fluor, slw blmng gm ct flor, mod dul gm rsd mf fl, tr MRLSTN
Codell SS @ 7669' MD (7260' TVD)
Landed Curve @ 7765' MD (7270' TVD) at 21:50 hrs on 4/20/18
med brn, srwrly
cuttngs, sbconcdl
m-hd, gd min fluor,
dul gm rsd mf fl.
Scale Change
7300
SS: (50%) brn gry - lt brn gry, v fn - fn gmd, dom sub-ang, dom mod sphrcty, fr srtg, gm sprt w/occ mtrx sprt, occ clac cmnt, com slt/cly mtrx, frble-mod hrd, est 10% pp por, nr evn wk gm pri fl, near even stain, gd bri gm blu cut fl, v gd mod-bri gm rsd fl, PINK stn with AR.
LS (50%)
SS: (70%) brn gry - lt brn gry, v fn - fn gmd, dom sub-ang, dom mod sphrcty, fr srtg, gm sprt w/occ mtrx sprt, occ clac cmnt, com slt/cly mtrx, frble-mod hrd, est 10% pp por, nr evn wk gm pri fl, sl stn, v gd bri gm blu cut fl, v gd mod-bri gm rsd fl.
LS (30%)
SS: (90%) brn gry - lt brn gry, v fn - fn gmd, dom sub-ang, dom mod sphrcty, fr srtg, gm sprt w/occ mtrx sprt, occ clac cmnt, com slt/cly mtrx, frble-mod hrd, est 10% pp por, nr evn wk gm pri fl, near even stain, flash v gd bri gm blu cut fl, v gd mod-bri gm rsd fl.
LS (10%)
Ft. Hays LS @ 7574' MD (7238' TVD)
7350
500
500
500
500
Total (units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)
0
0
0
0
MWI/MWO 9.6 VIS 57
MWI 9.65 MWO 9.6 VIS 57

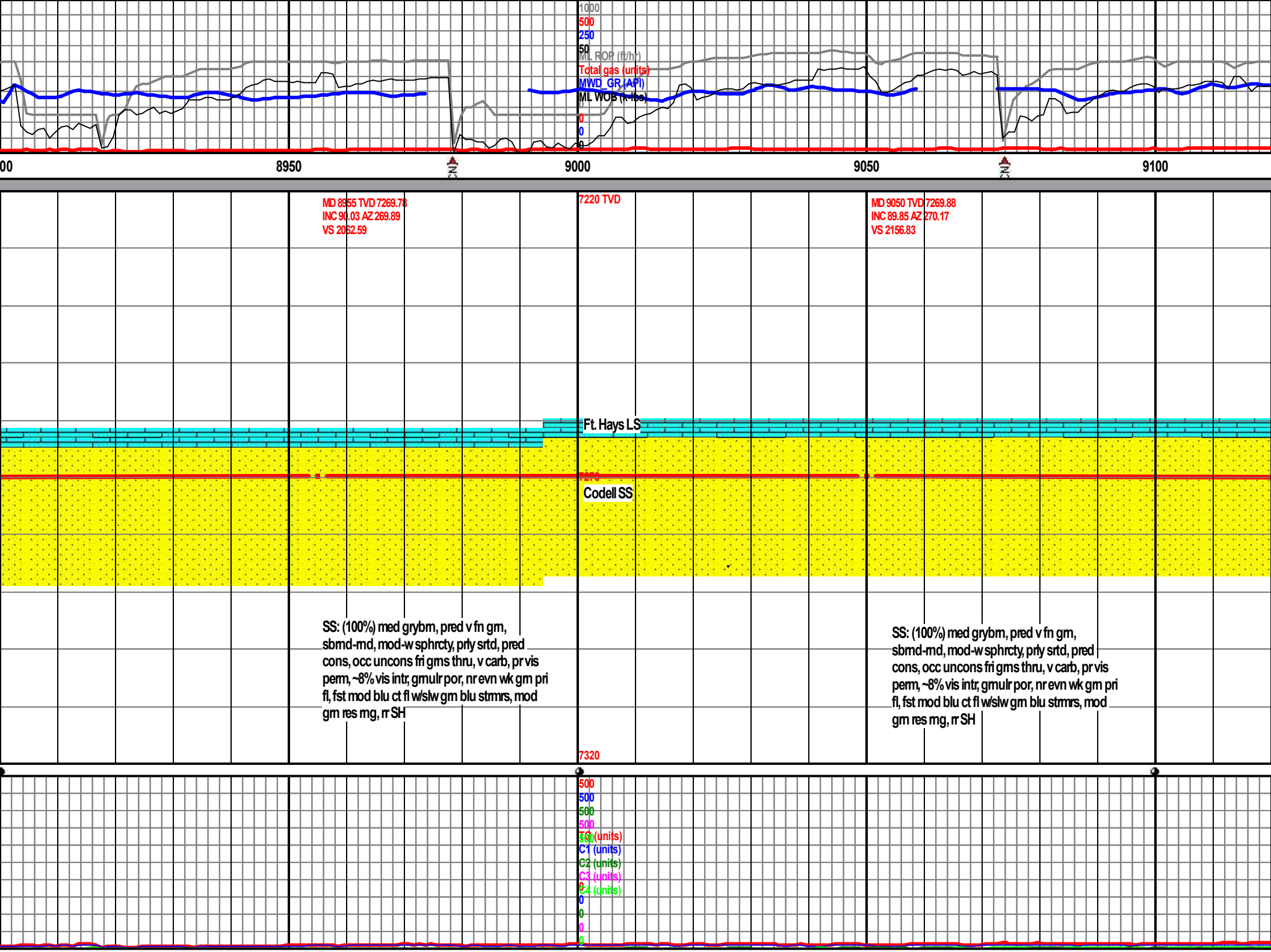

1000
500
250
50
ML ROP (ft/hr)
Total gas (units)
MWD_GR (API)
ML WOB (k-lbs)
0
0
0
00
7850
7900
7950
8000
7250 TVD
MD 7833 TVD 7271.48
INC 90.8 AZ 270.21
VS 965.93
MD 7927 TVD 7270.95
INC 89.85 AZ 261.62
VS 1058.05
Ft. Hays LS
Codell SS
7300
7350
SS: (100%) brn gry - lt brn gry, v fn - fn gmd, dom sub-ang, dom mod sphrcty, fr srtg, gm sprt w/occ mtrx sprt, occ clac cmnt, com slt/cly mtrx, frble-mod hrd, est 10% pp por, nr evn wk gm pri fl, near even stain, fst gd bri gm blu cut fl, v gd mod-bri gm rsd fl, tr LS.
SS: (100%) brn gry - lt brn gry, v fn - fn gmd, dom sub-ang, dom mod sphrcty, fr srtg, gm sprt w/occ mtrx sprt, occ clac cmnt, com slt/cly mtrx, frble-mod hrd, est 10% pp por, nr evn wk gm pri fl, near even stain, fst gd bri gm blu cut fl, v gd mod-bri gm rsd fl.
MW 9.8 MWO 9.7 VIS 57
500
500
500
500
C1 (units)
C2 (units)
C3 (units)
C4 (units)

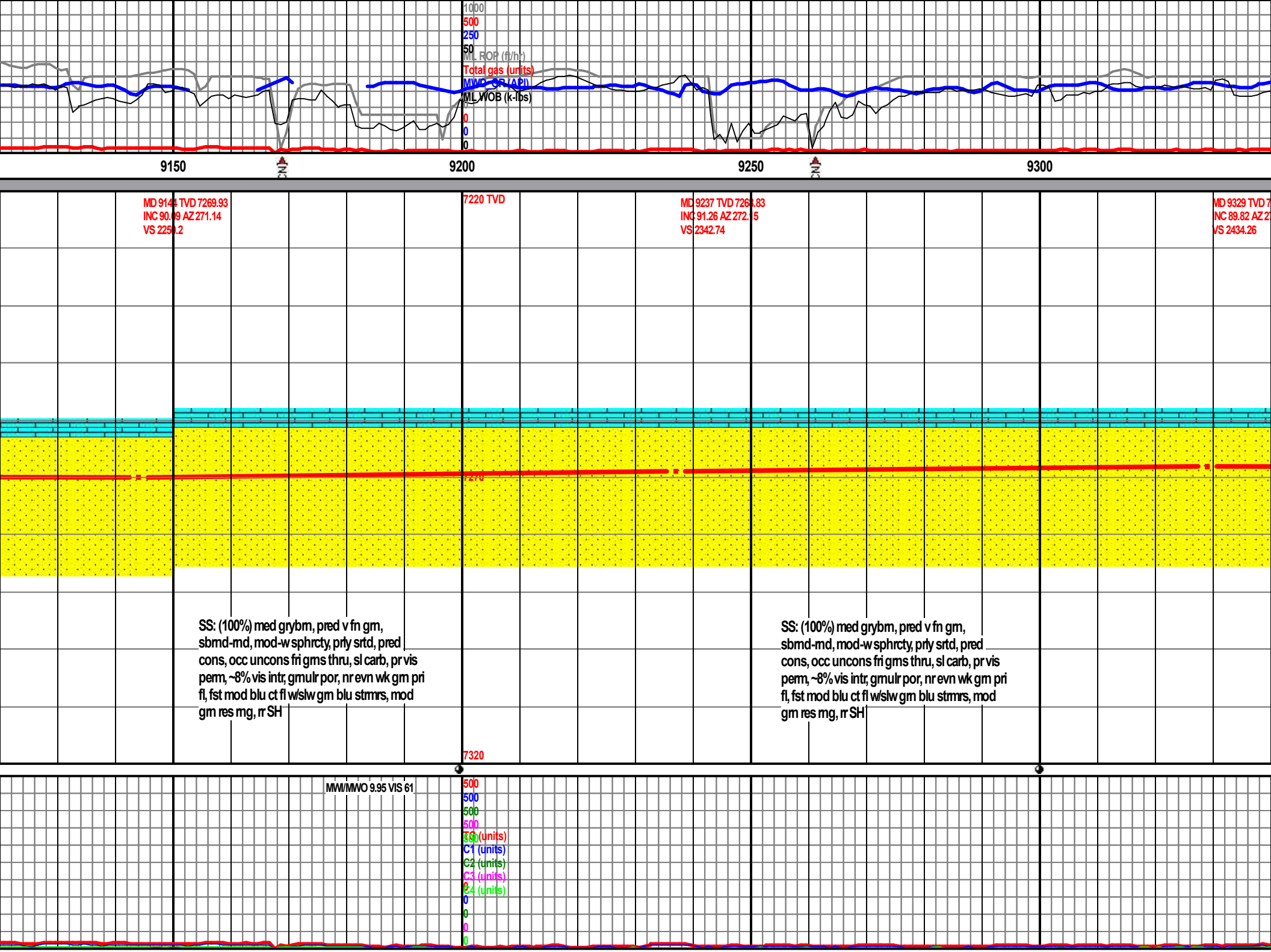

4/21/2018
1000
500
250
50
ML ROP (ft/hr)
Total gas (units)
MWD_GR (API)
ML WOB (k-lbs)
0
0
0
8050
8100
8150
8200
MD 8019 TVD 7271.32
INC 89.69 AZ 257.75
VS 1145.74
MD 8113 TVD 7271.78
INC 89.75 AZ 259
VS 1234.67
7250 TVD
MD 8206
INC 89.78
VS 1323.
TOOH @8,231' MD for MWD to
commence drilling @12:34 HR
4/21/18, begin cirulating through
buster after trip.
BHA #3, 8 1/2", BHI, ATD505T, #5283
5X15, In @8231', out @15218', drille
19.1 hrs., Rotary Steerable, AutoTra
MM, XL45/RS; .27 rpg
7300
SS: (100%) brn gry - lt brn gry, v fn - fn gmd, dom sub-ang, dom mod sphrcty, fr srtg, gm sprt w/occ mtrx sprt, occ clac cmnt, com slt/cly mtrx, frble-mod hrd, est 10% pp por, nr evn wk gm pri fl, near even stain, fst gd bri gm blu cut fl, v gd mod-bri gm rsd fl.
SS: (100%) brn gry - lt brn gry, v fn - fn gmd, dom sub-ang, dom mod sphrcty, fr srtg, gm sprt w/occ mtrx sprt, occ clac cmnt, com slt/cly mtrx, frble-mod hrd, est 10% pp por, nr evn wk gm pri fl, near even stain, fst gd bri gm blu cut fl, v gd mod-bri gm rsd fl, rr SH.
7350
MW/MWO 9.75 VIS 58
MW/MWO 10.0 VIS 72
500
500
500
500
C1 (units)
C2 (units)
C3 (units)
C4 (units)
0
0
0
Trip Gas - 18 u

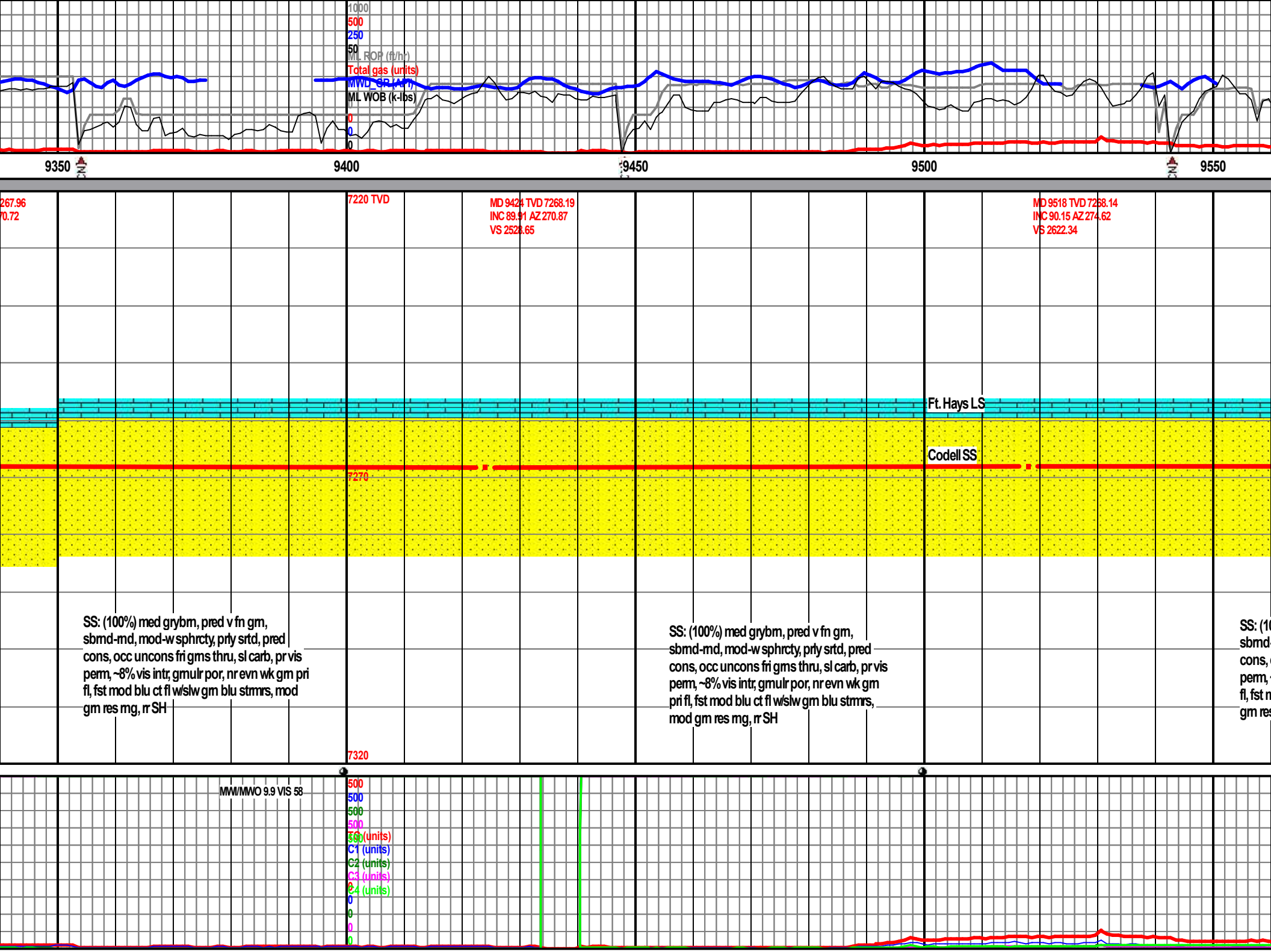

1000
500
250
50
ML ROP (ft/hr)
Total gas (units)
MWD_GR (API)
ML WOB (k-lbs)
0
0
0
8250
8300
8350
8400
8450
MD 8300 TVD 7272.27
INC 90.09 AZ 264.96
VS 1414.35
MD 8393 TVD 7271.99
INC 90.25 AZ 269.74
VS 1505.93
ols,
S on
h gas
853,
d 6987' in
k, MWD,
7300
7350
SS: (95%) lt med-med gry, pred v fn gm, sbrnd-md, mod-w sphrcty, prly srtd, pred cons, occ uncons fri gms thru, 65% carb/cly mtx, v carb, pr vis perm, ~8% vis intr, gmulr por, nr evn wk gm pri fl, fst mod blu ct fl w/slw gm blu stmrs, mod gm res mg
SS: (100%) med grybrn, pred v fn gm, sbrnd-md gm, mod-w sphrcty, pred cons, occ uncons fri gms thru, com mtrx spprtd, pr vis perm, ~8% vis intr, gmulr por, nr evn wk gm pri fl, fst mod blu ct fl w/slw gm blu stmrs, mod gm res mg
SS: (100
sbrnd-r
cons, o
sl carb,
evn wk
blu stm
Depth 8230'
MW 9.85
VIS 56
PV 24
YP 6
Gels 7/10/12
Fil 7.6
Sol 14
O/W 79/21
Cl 37000
ES 708
500
500
500
500
Total (units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)
0
0
0
0

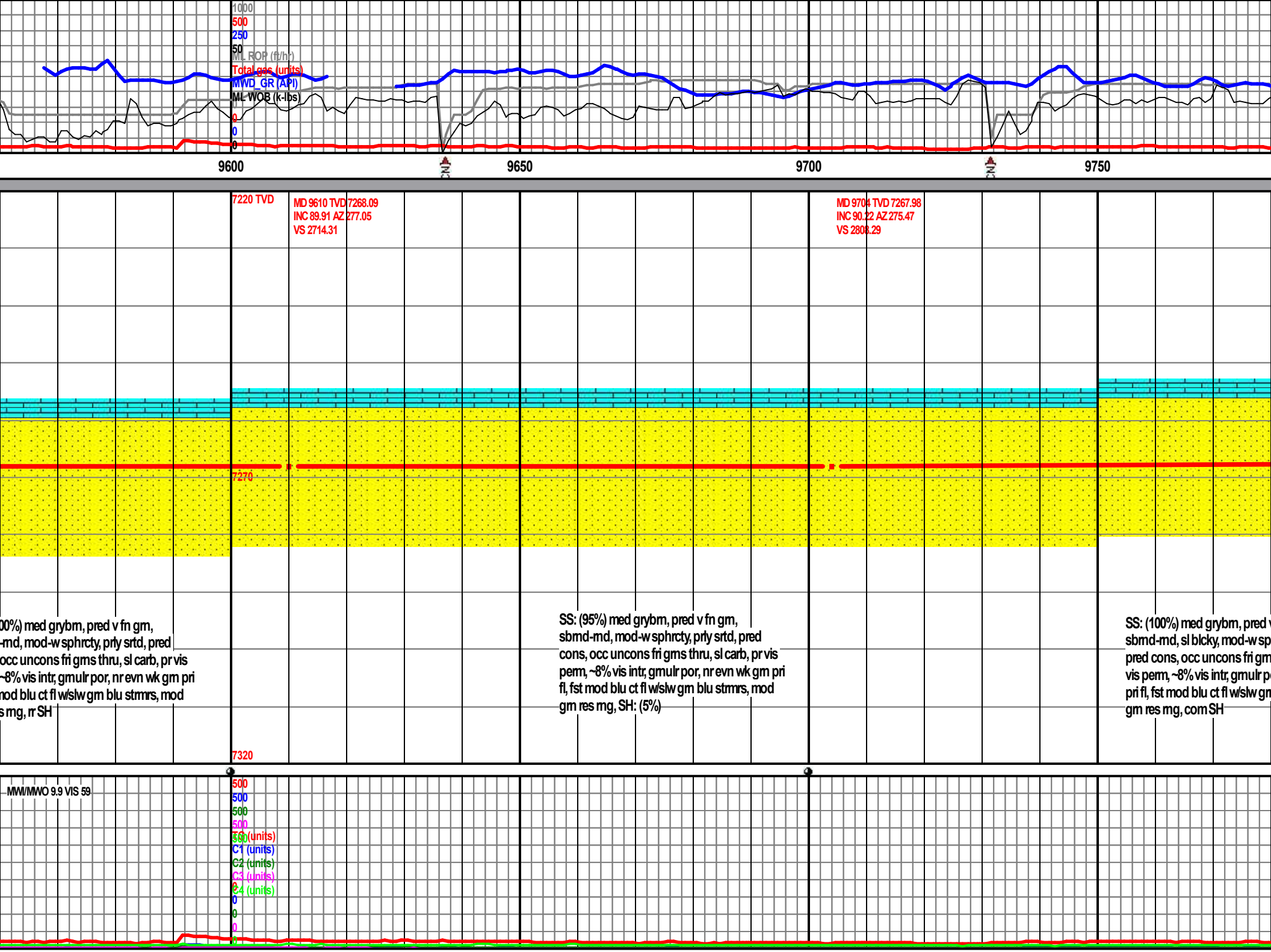

1000
500
250
50
ML ROP (ft/hr)
Total gas (units)
MWD_GR (API)
ML WOB (k-lbs)
0
0
0
8500
8550
8600
8650
MD 8487 TVD 727
INC 90.37 AZ 270.92
VS 1599.24
MD 8581 TVD 7270.95
INC 90.28 AZ 268.71
VS 1692.43
7220 TVD
Ft. Hays LS
Codell SS
7270
7320
SS: (100%) lt med-med gry, pred v fn gm, sbrnd-md, mod-w sphrcty, prly srtd, pred cons, occ uncons fri gms thru, v carb, pr vis perm, ~8% vis intr, gmulr por, nr evn wk gm pri fl, fst mod blu ct fl w/slw gm blu strmrs, mod gm res mg, rr SH
MWI/MWO 9.95 VIS 64
500
500
500
500
C1 (units)
C2 (units)
C3 (units)
C4 (units)
0
0
0
0

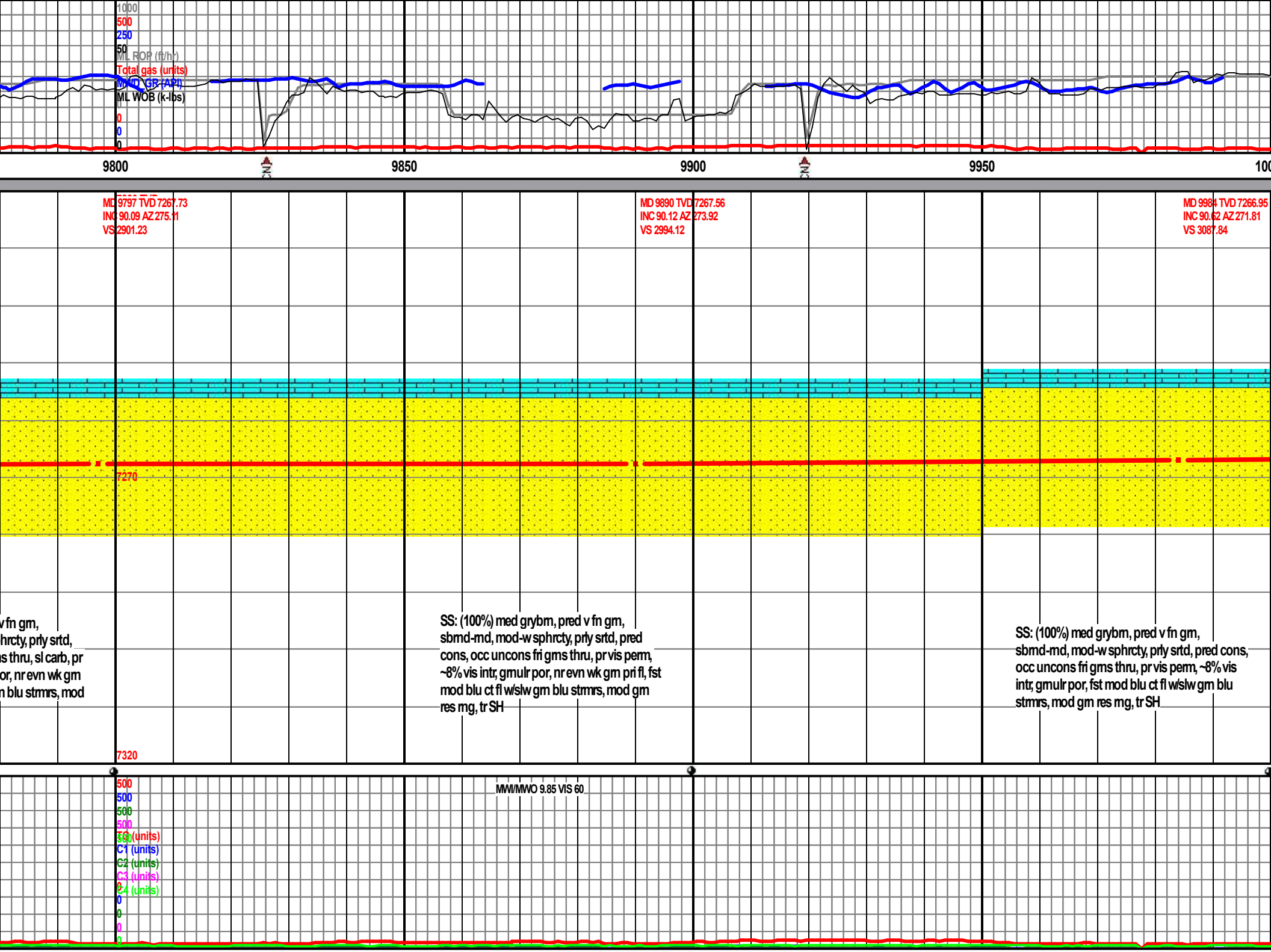

1000
500
250
50
ML ROP (ft/hr)
Total gas (units)
MWD_GR (API)
ML WOB (k-lbs)
0
0
0
8700
8750
8800
8850
89
4 TVD 7270.67
06 AZ 267.98
4.31
MD 8768 TVD 7270.39
INC 90.28 AZ 268.96
VS 1877.2
7220 TVD
MD 8863 TVD 7269.98
INC 90.22 AZ 270.08
VS 1971.33
7270
v fn gm,
y srtd, pred
u, v carb, pr vis
nr evn wk gm
n blu stmrs,
SS: (100%) med grybrn, pred v fn gm, sbrnd-rnd, mod-w sphrcty, prly srtd, pred cons, occ uncons fri gms thru, v carb, pr vis perm, ~8% vis intr, gmulr por, nr evn wk gm pri fl, fst mod blu ct fl w/slw gm blu stmrs, mod gm res rng, tr SH
SS: (100%) med grybrn, pred v fn gm, sbrnd-rnd, mod-w sphrcty, prly srtd, pred cons, occ uncons fri gms thru, v carb, pr vis perm, ~8% vis intr, gmulr por, nr evn wk gm pri fl, fst mod blu ct fl w/slw gm blu stmrs, mod gm res rng, rr SH
7320
500
500
500
500
300 (units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)
0
0
0
0
MW/MWO 9.95 VIS 60
Depth 8863'
MW 9.95
VIS 60
PV 25
YP 10
Gels 7/12/15
Fil 6.8
Sol 14
O/W 79/21
Cl 38000
ES 690

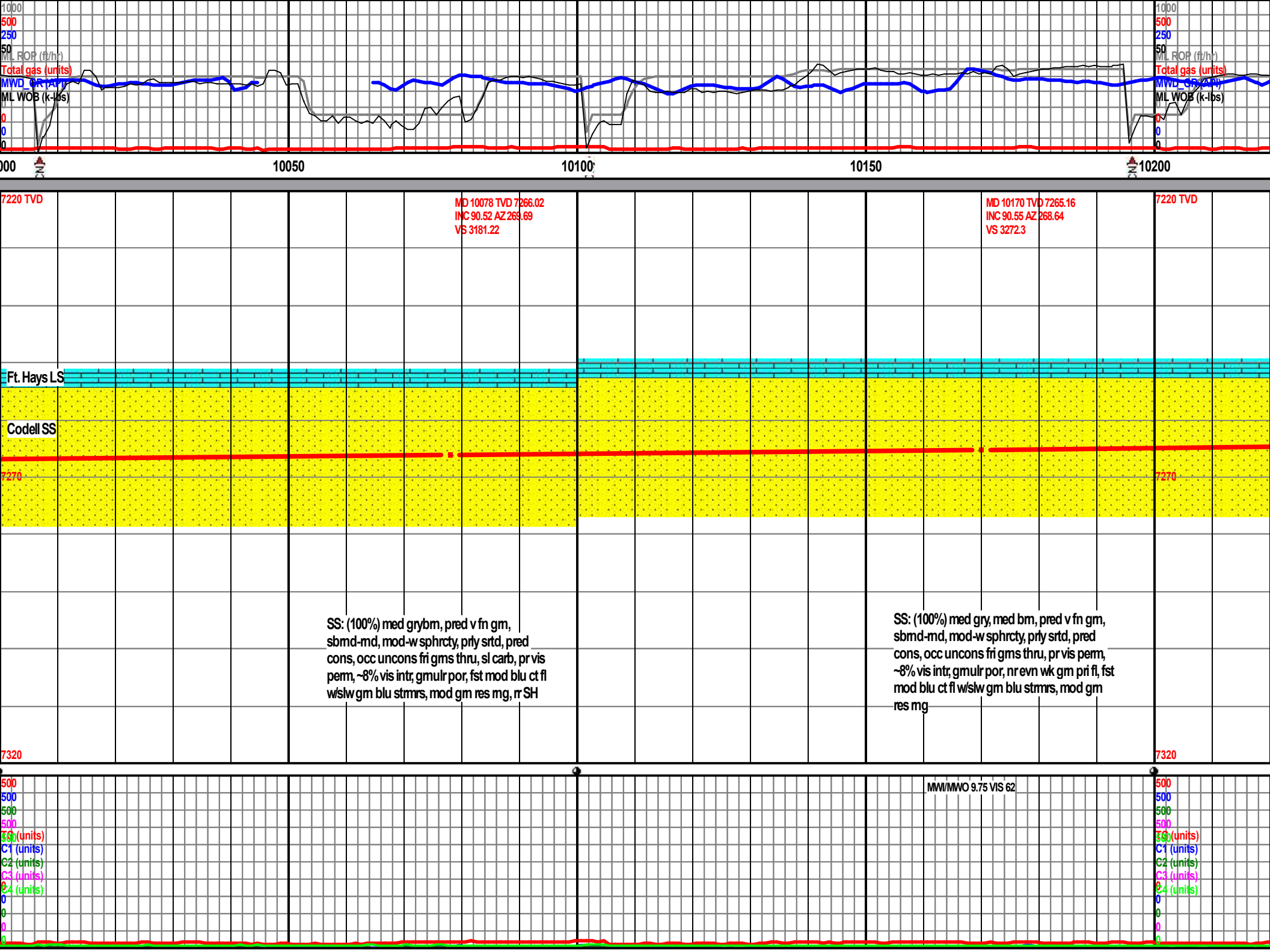

1000
500
250
50
ML ROP (ft/hr)
Total gas (units)
MWD_GR (API)
ML WOB (k-lbs)
0
0
0
00
8950
CN
9000
9050
CN
9100
MD 8955 TVD 7269.78
INC 90.03 AZ 269.89
VS 2052.59
7220 TVD
MD 9050 TVD 7269.88
INC 89.85 AZ 270.17
VS 2156.83
Ft. Hays LS
Codell SS
SS: (100%) med grybrn, pred v fn grn, sbrnd-rnd, mod-w sphrcty, prly srtd, pred cons, occ uncons fri grns thru, v carb, pr vis perm, ~8% vis intr, grnulr por, nr evn wk grn pri fl, fst mod blu ct fl w/slw grn blu strmrs, mod grn res rng, rr SH
SS: (100%) med grybrn, pred v fn grn, sbrnd-rnd, mod-w sphrcty, prly srtd, pred cons, occ uncons fri grns thru, v carb, pr vis perm, ~8% vis intr, grnulr por, nr evn wk grn pri fl, fst mod blu ct fl w/slw grn blu strmrs, mod grn res rng, rr SH
7320
500
500
500
500
Tot (units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)
0
0
0
0

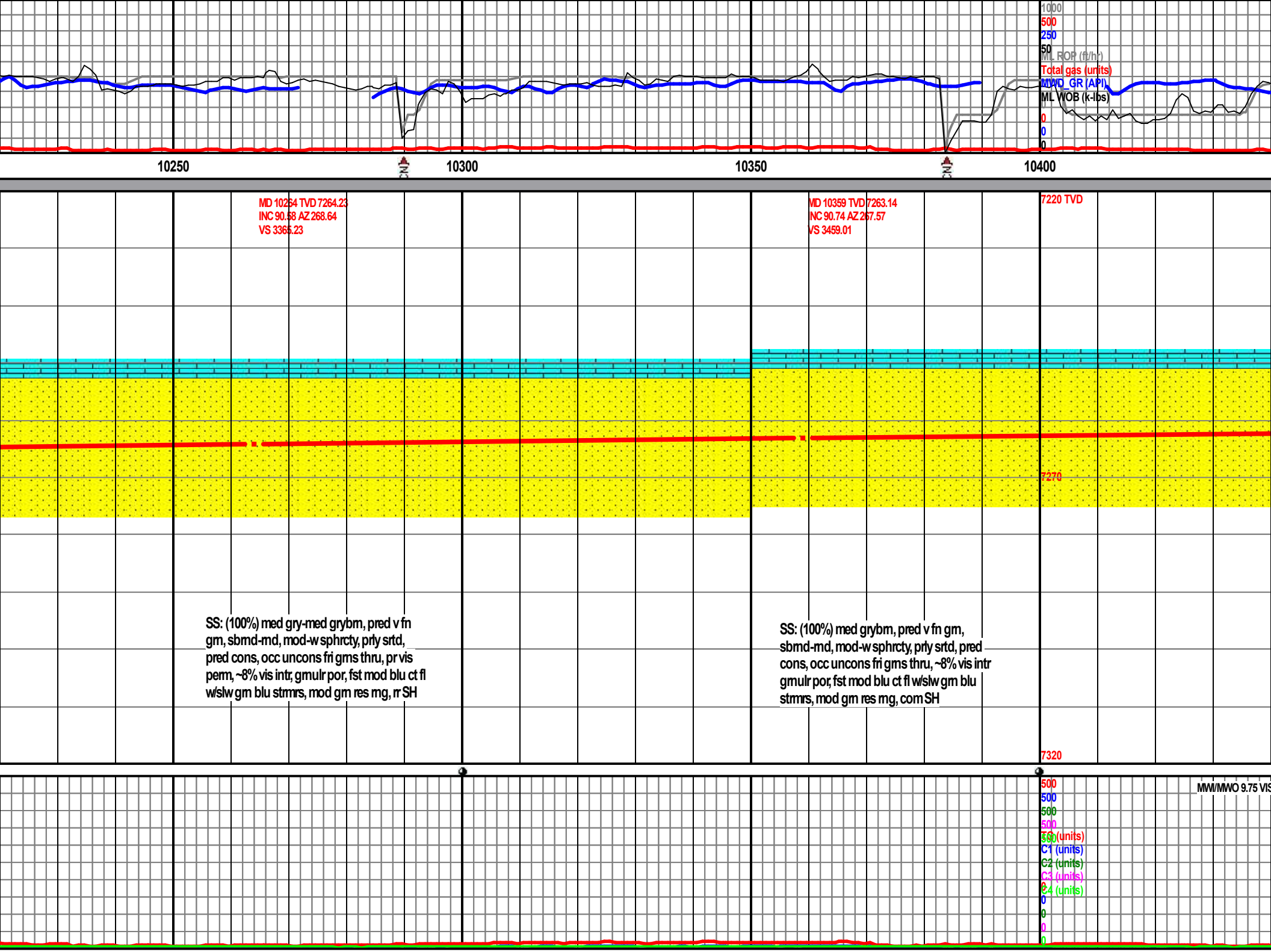

1000
500
250
50
ML ROP (ft/hr)
Total gas (units)
MWD GR (API)
ML WOB (k-lbs)
0
0
0
9150
CN
9200
9250
CN
9300
MD 9144 TVD 7269.93
INC 90.09 AZ 271.14
VS 2250.2
7220 TVD
MD 9237 TVD 7268.83
INC 91.26 AZ 272.15
VS 2342.74
MD 9329 TVD 7
INC 89.82 AZ 27
VS 2434.26
7270
SS: (100%) med grybrn, pred v fn gm, sbrnd-rnd, mod-w sphrcty, prly srtd, pred cons, occ uncons fri gms thru, sl carb, pr vis perm, ~8% vis intr, gmulr por, nr evn wk gm pri fl, fst mod blu ct fl w/slw gm blu stmrs, mod gm res mg, rr SH
SS: (100%) med grybrn, pred v fn gm, sbrnd-rnd, mod-w sphrcty, prly srtd, pred cons, occ uncons fri gms thru, sl carb, pr vis perm, ~8% vis intr, gmulr por, nr evn wk gm pri fl, fst mod blu ct fl w/slw gm blu stmrs, mod gm res mg, rr SH
7320
MW/MWO 9.95 VIS 61
500
500
500
500
500 (units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)
0
0
0
0

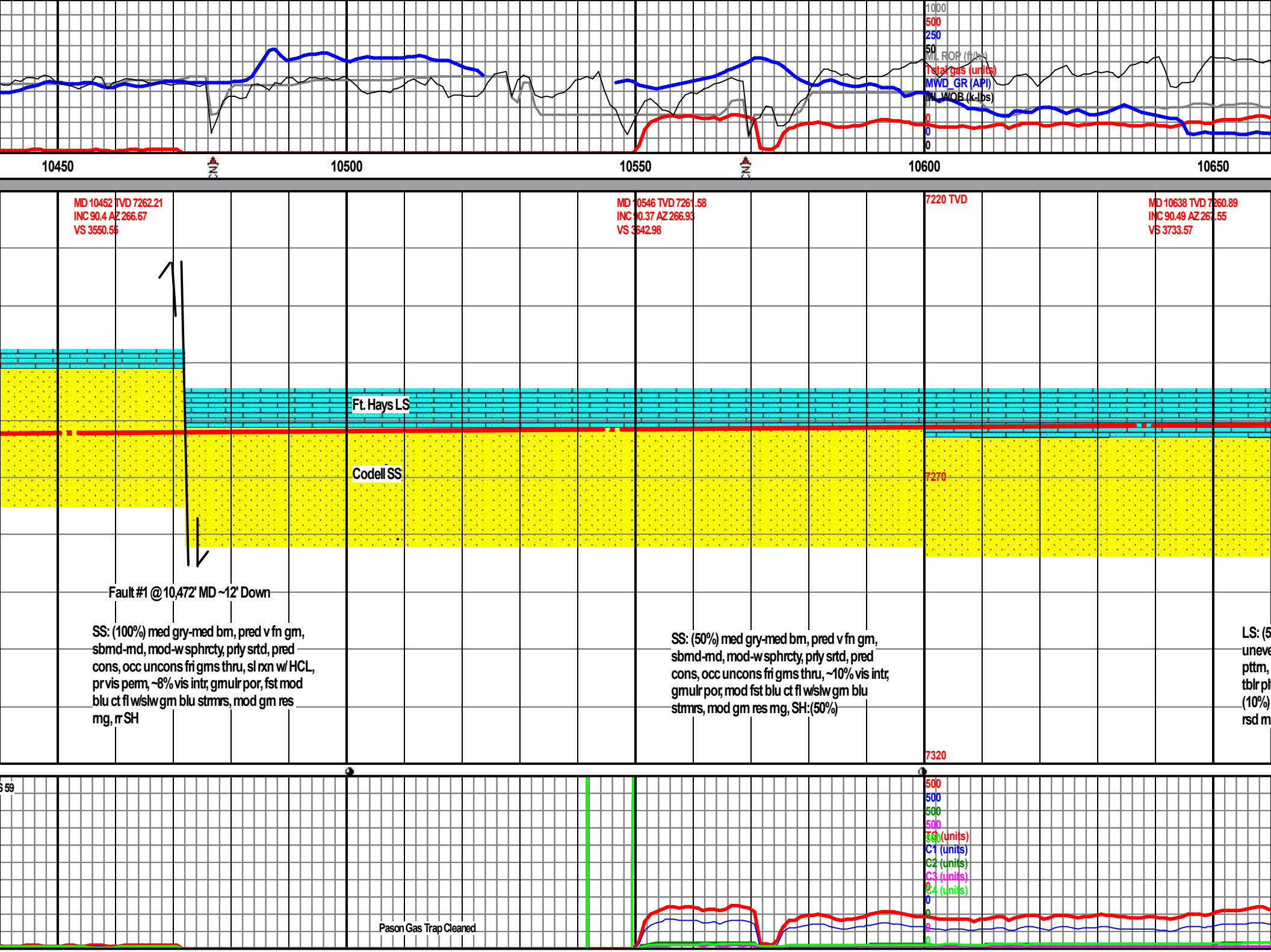

1000
500
250
50
ML ROP (ft/hr)
Total gas (units)
MWD_GR (API)
ML WOB (k-lbs)
0
0
0
9350
9400
9450
9500
9550
267.96
70.72
7220 TVD
MD 9424 TVD 7268.19
INC 89.91 AZ 270.87
VS 2528.65
MD 9518 TVD 7268.14
INC 90.15 AZ 274.62
VS 2622.34
Ft. Hays LS
Codell SS
7270
7320
SS: (100%) med grybrn, pred v fn gm, sbrnd-md, mod-w sphrcty, prly srtd, pred cons, occ uncons fri gms thru, sl carb, pr vis perm, ~8% vis intr, gmulr por, nr evn wk gm pri fl, fst mod blu ct fl w/slw gm blu strmrs, mod gm res mg, rr SH
SS: (100%) med grybrn, pred v fn gm, sbrnd-md, mod-w sphrcty, prly srtd, pred cons, occ uncons fri gms thru, sl carb, pr vis perm, ~8% vis intr, gmulr por, nr evn wk gm pri fl, fst mod blu ct fl w/slw gm blu strmrs, mod gm res mg, rr SH
MW/MWO 9.9 VIS 58
500
500
500
500
C1 (units)
C2 (units)
C3 (units)
C4 (units)
0
0
0
0

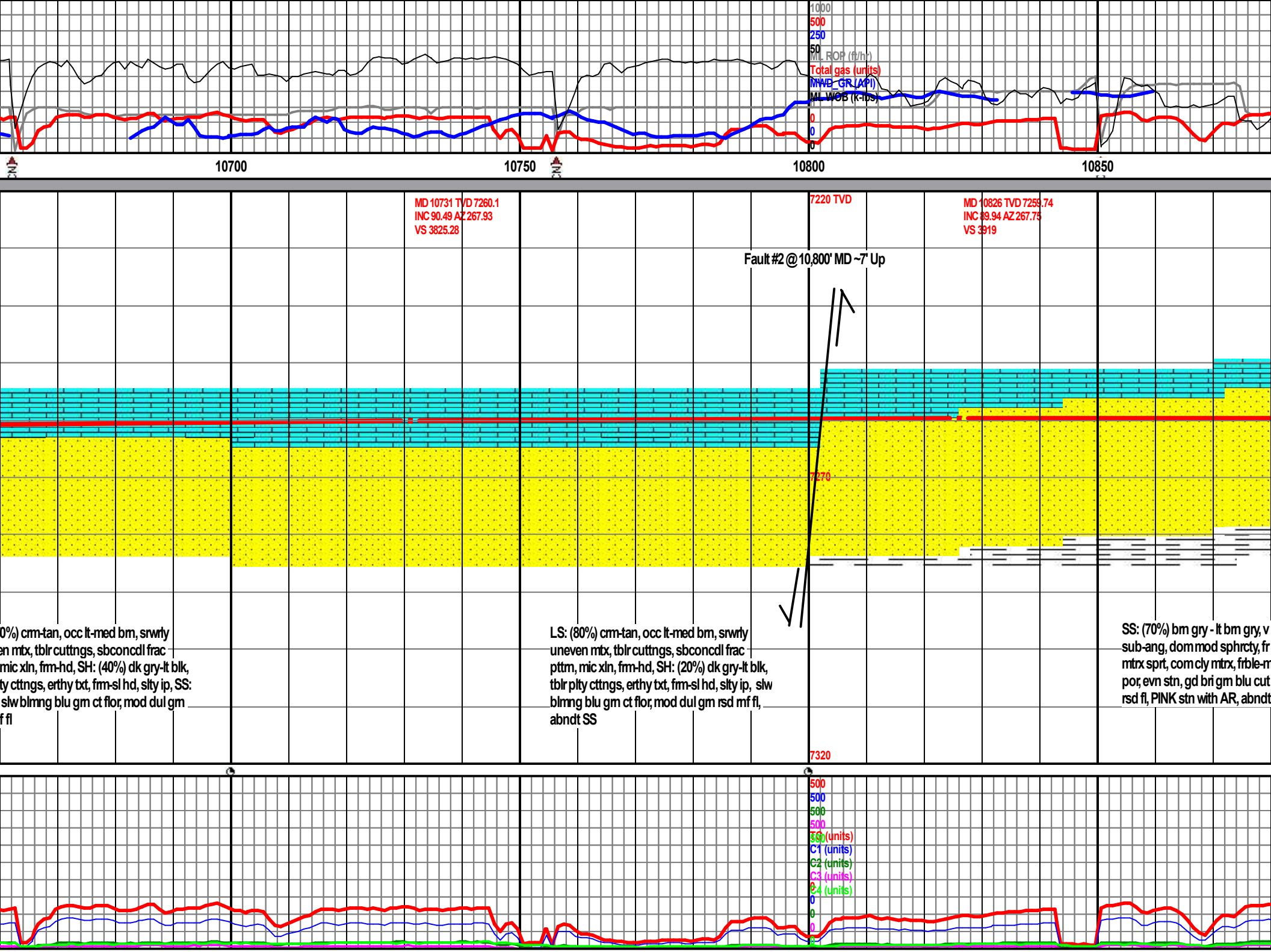

1000
500
250
50
ML ROP (ft/hr)
Total gas (units)
MWD_GR (API)
ML WOB (k-lbs)
0
0
0
9600
9650
9700
9750
7220 TVD
MD 9610 TVD 7268.09
INC 89.91 AZ 277.05
VS 2714.31
MD 9704 TVD 7267.98
INC 90.22 AZ 275.47
VS 2808.29
7270
7320
00%) med grybrn, pred v fn gm,
-md, mod-w sphrcty, prly srtd, pred
occ uncons fri gms thru, sl carb, pr vis
~8% vis intr, gmulr por, nr evn wk gm pri
nod blu ct fl w/slw gm blu stmmrs, mod
s mg, rr SH
SS: (95%) med grybrn, pred v fn gm,
sbrnd-md, mod-w sphrcty, prly srtd, pred
cons, occ uncons fri gms thru, sl carb, pr vis
perm, ~8% vis intr, gmulr por, nr evn wk gm pri
fl, fst mod blu ct fl w/slw gm blu stmmrs, mod
gm res mg, SH: (5%)
SS: (100%) med grybrn, pred
sbrnd-md, sl blcky, mod-w sp
pred cons, occ uncons fri gm
vis perm, ~8% vis intr, gmulr p
pri fl, fst mod blu ct fl w/slw gm
gm res mg, com SH
MW/MWO 9.9 VIS 59
500
500
500
500
C1 (units)
C2 (units)
C3 (units)
C4 (units)
0
0
0

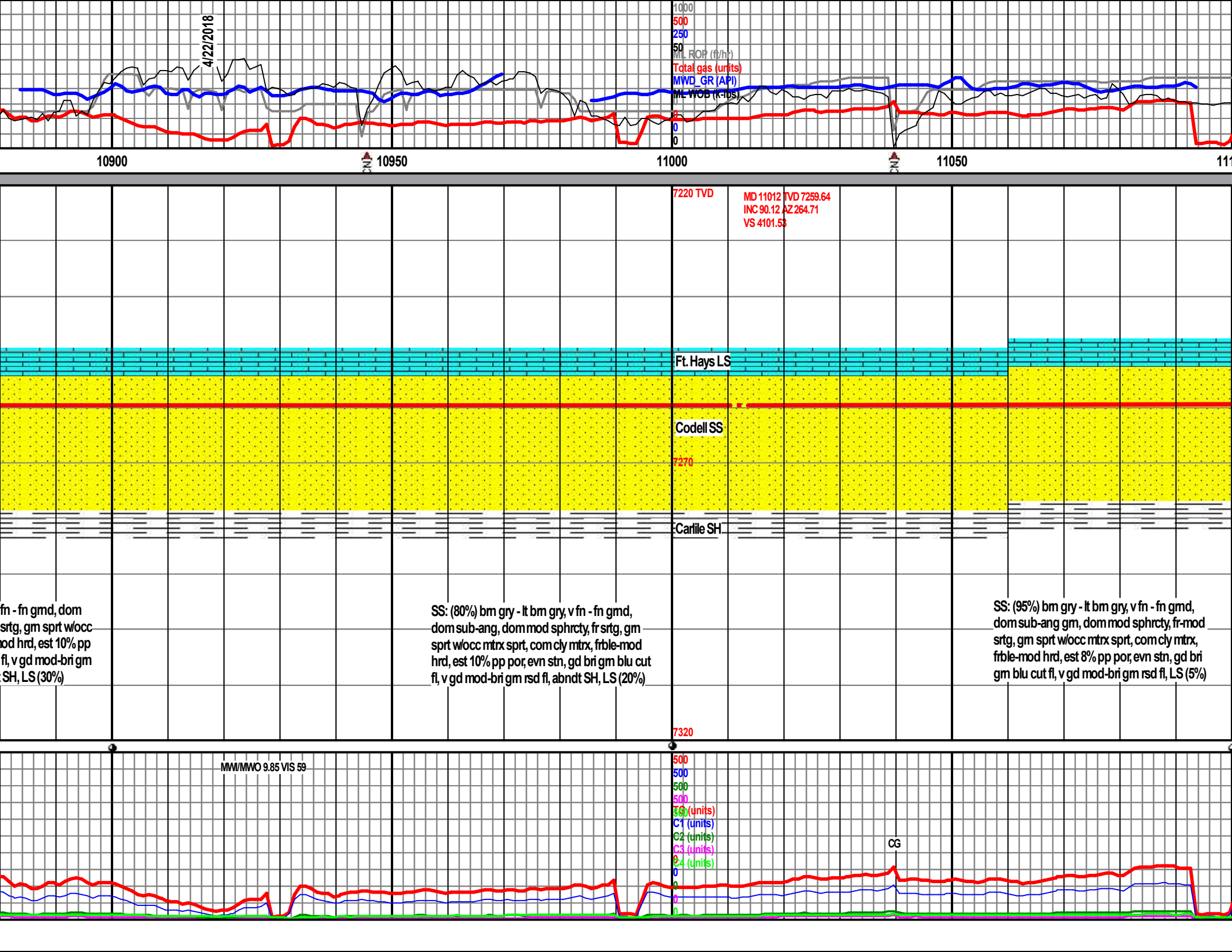

1000
500
250
50
ML ROP (ft/h')
Total gas (units)
MWD GR (API)
ML WOB (k-lbs)
0
0
0
9800
9850
9900
9950
MD 9797 TVD 7267.73
INC 90.09 AZ 275.11
VS 2901.23
MD 9890 TVD 7267.56
INC 90.12 AZ 273.92
VS 2994.12
MD 9984 TVD 7266.95
INC 90.62 AZ 271.81
VS 3087.84
7270
7320
v fn gm,
hrcty, prly srtd,
s thru, sl carb, pr
or, nr evn wk gm
n blu stmrs, mod
SS: (100%) med grybm, pred v fn gm, sbrnd-rnd, mod-w sphrcty, prly srtd, pred cons, occ uncons fri gms thru, pr vis perm, ~8% vis intr, gmulr por, nr evn wk gm pri fl, fst mod blu ct fl w/slw gm blu stmrs, mod gm res mg, tr SH
SS: (100%) med grybm, pred v fn gm, sbrnd-rnd, mod-w sphrcty, prly srtd, pred cons, occ uncons fri gms thru, pr vis perm, ~8% vis intr, gmulr por, fst mod blu ct fl w/slw gm blu stmrs, mod gm res mg, tr SH
500
500
500
500
(units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)
0
0
0
0
MW/MWO 9.85 VIS 60

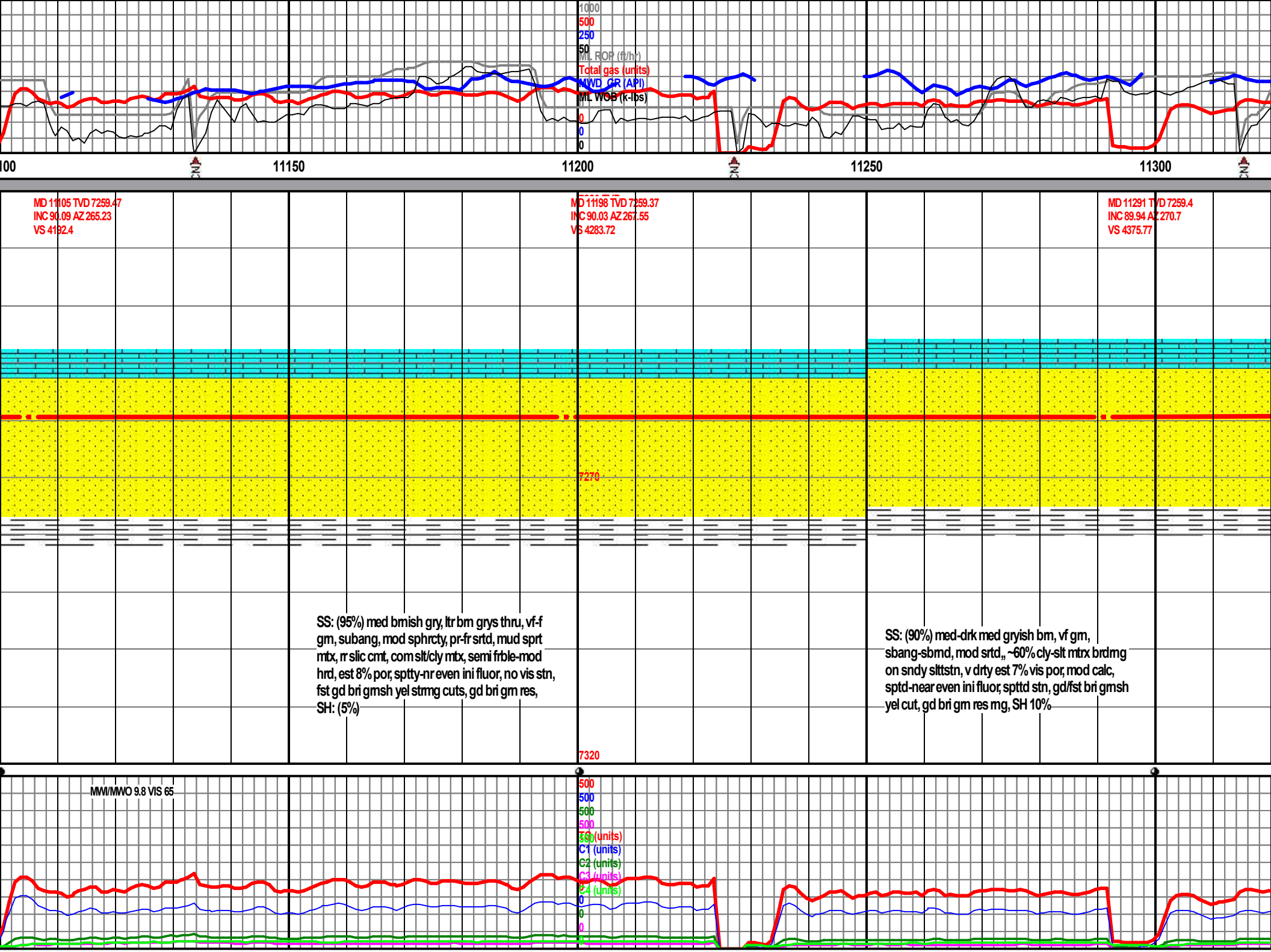

1000
500
250
50
ML ROP (ft/hr)
Total gas (units)
MWD_GR (API)
ML WOB (k-lbs)
0
0
0
10050
10100
10150
10200
7220 TVD
MD 10078 TVD 7266.02
INC 90.52 AZ 269.69
VS 3181.22
MD 10170 TVD 7265.16
INC 90.55 AZ 268.64
VS 3272.3
Ft. Hays LS
Codell SS
7270
SS: (100%) med grybrn, pred v fn gm, sbrnd-md, mod-w sphrcty, prly srtd, pred cons, occ uncons fri gms thru, sl carb, pr vis perm, ~8% vis intr, gmulr por, fst mod blu ct fl w/slw gm blu stmrs, mod gm res mg, rr SH
SS: (100%) med gry, med brn, pred v fn gm, sbrnd-md, mod-w sphrcty, prly srtd, pred cons, occ uncons fri gms thru, pr vis perm, ~8% vis intr, gmulr por, nr evn wk gm pri fl, fst mod blu ct fl w/slw gm blu stmrs, mod gm res mg
7320
MWI/MWO 9.75 VIS 62
C1 (units)
C2 (units)
C3 (units)
C4 (units)

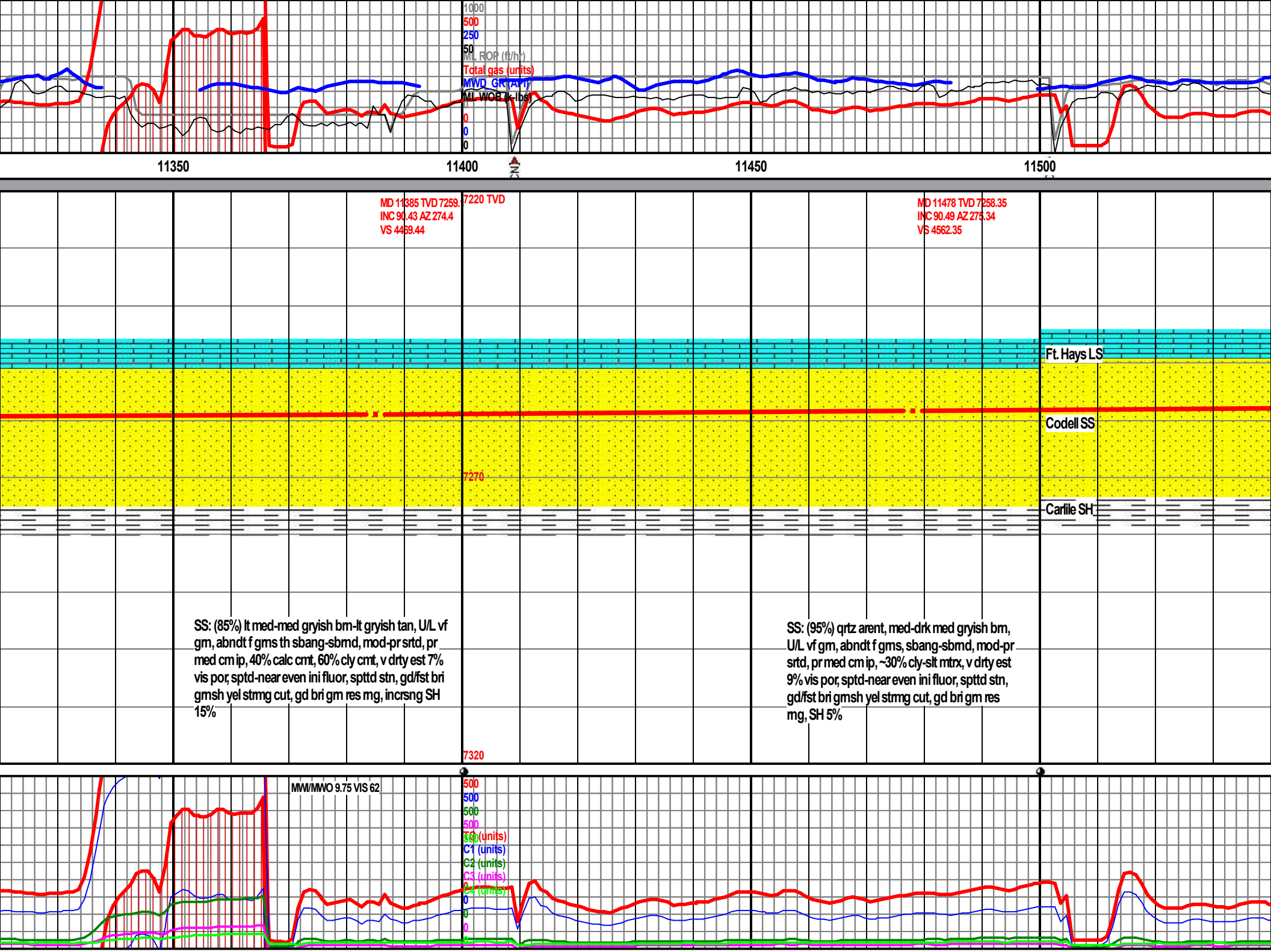

1000
500
250
50
ML ROP (ft/hr)
Total gas (units)
MWD_GR (API)
ML WOB (k-lbs)
0
0
0
10250
10300
10350
10400
MD 10264 TVD 7264.23
INC 90.58 AZ 268.64
VS 3365.23
MD 10359 TVD 7263.14
INC 90.74 AZ 267.57
VS 3459.01
7220 TVD
7270
7320
SS: (100%) med gry-med grybrn, pred v fn gm, sbrnd-rnd, mod-w sphrcty, prly srtd, pred cons, occ uncons fri gms thru, pr vis perm, ~8% vis intr, gmulr por, fst mod blu ct fl w/slw gm blu stmrs, mod gm res mg, rr SH
SS: (100%) med grybrn, pred v fn gm, sbrnd-rnd, mod-w sphrcty, prly srtd, pred cons, occ uncons fri gms thru, ~8% vis intr gmulr por, fst mod blu ct fl w/slw gm blu stmrs, mod gm res mg, com SH
500
500
500
500
C0 (units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)
0
0
0
0
MW/MWO 9.75 VIS

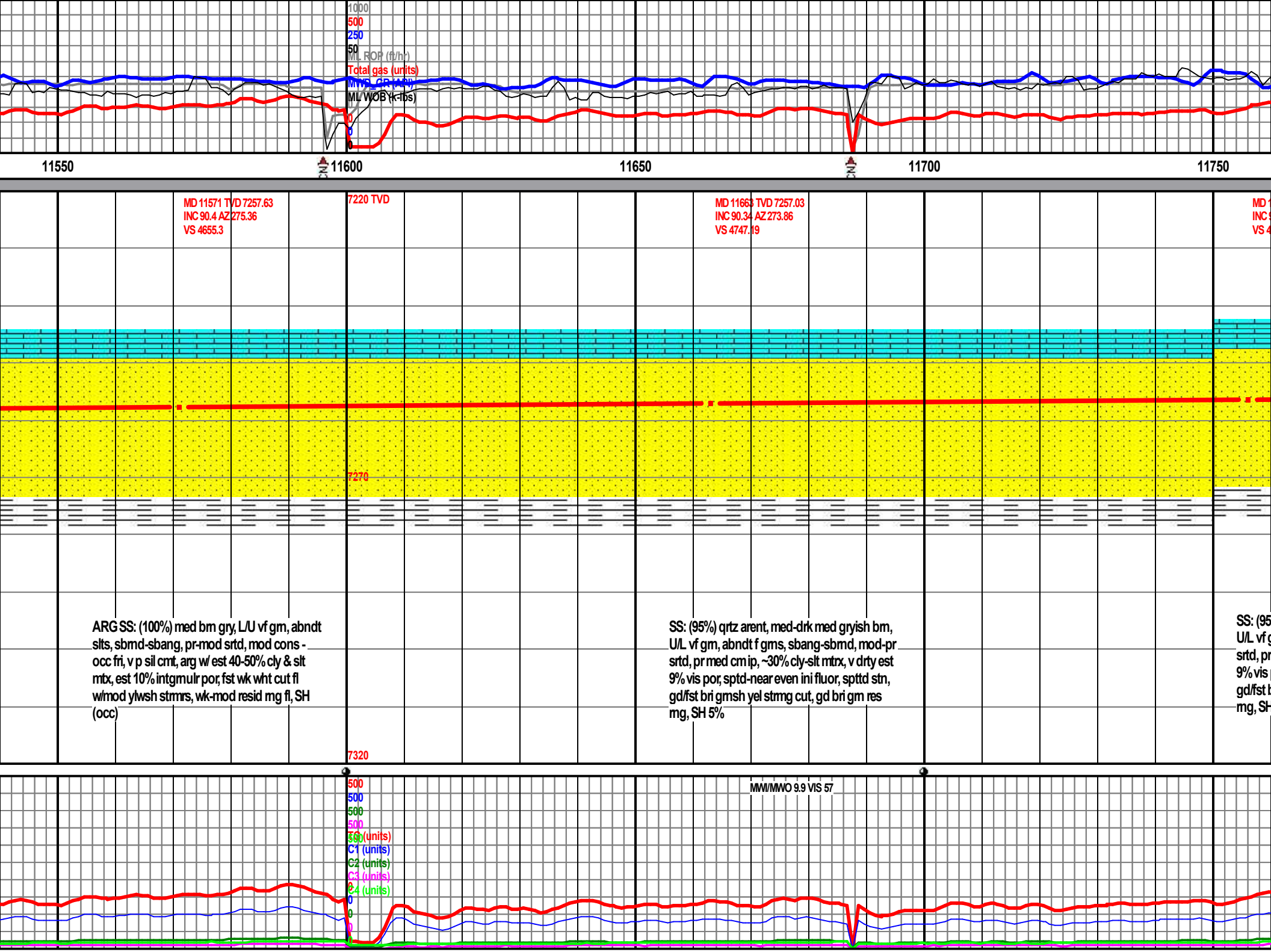

1000
500
250
50
ML ROP (ft/hr)
Total gas (units)
MWD_GR (API)
ML_WOB (k-lbs)
0
0
0
10450
10500
10550
10600
10650
MD 10452 TVD 7262.21
INC 90.4 AZ 266.67
VS 3550.55
MD 10546 TVD 7261.58
INC 90.37 AZ 266.93
VS 3642.98
7220 TVD
MD 10638 TVD 7260.89
INC 90.49 AZ 267.55
VS 3733.57
Ft. Hays LS
Codell SS
7270
Fault #1 @10,472' MD ~12' Down
SS: (100%) med gry-med brn, pred v fn gm, sbrnd-rnd, mod-w sphrcty, prly srtd, pred cons, occ uncons fri gms thru, sl rxn w/ HCL, pr vis perm, ~8% vis intr, gmulr por, fst mod blu ct fl w/slw gm blu strmrs, mod gm res rng, rr SH
SS: (50%) med gry-med brn, pred v fn gm, sbrnd-rnd, mod-w sphrcty, prly srtd, pred cons, occ uncons fri gms thru, ~10% vis intr, gmulr por, mod fst blu ct fl w/slw gm blu strmrs, mod gm res rng, SH:(50%)
LS: (5
uneve
pttm,
tblr pl
(10%)
rsd m
7320
500
500
500
500
C1 (units)
C2 (units)
C3 (units)
C4 (units)
0
0
0
0
Pason Gas Trap Cleaned

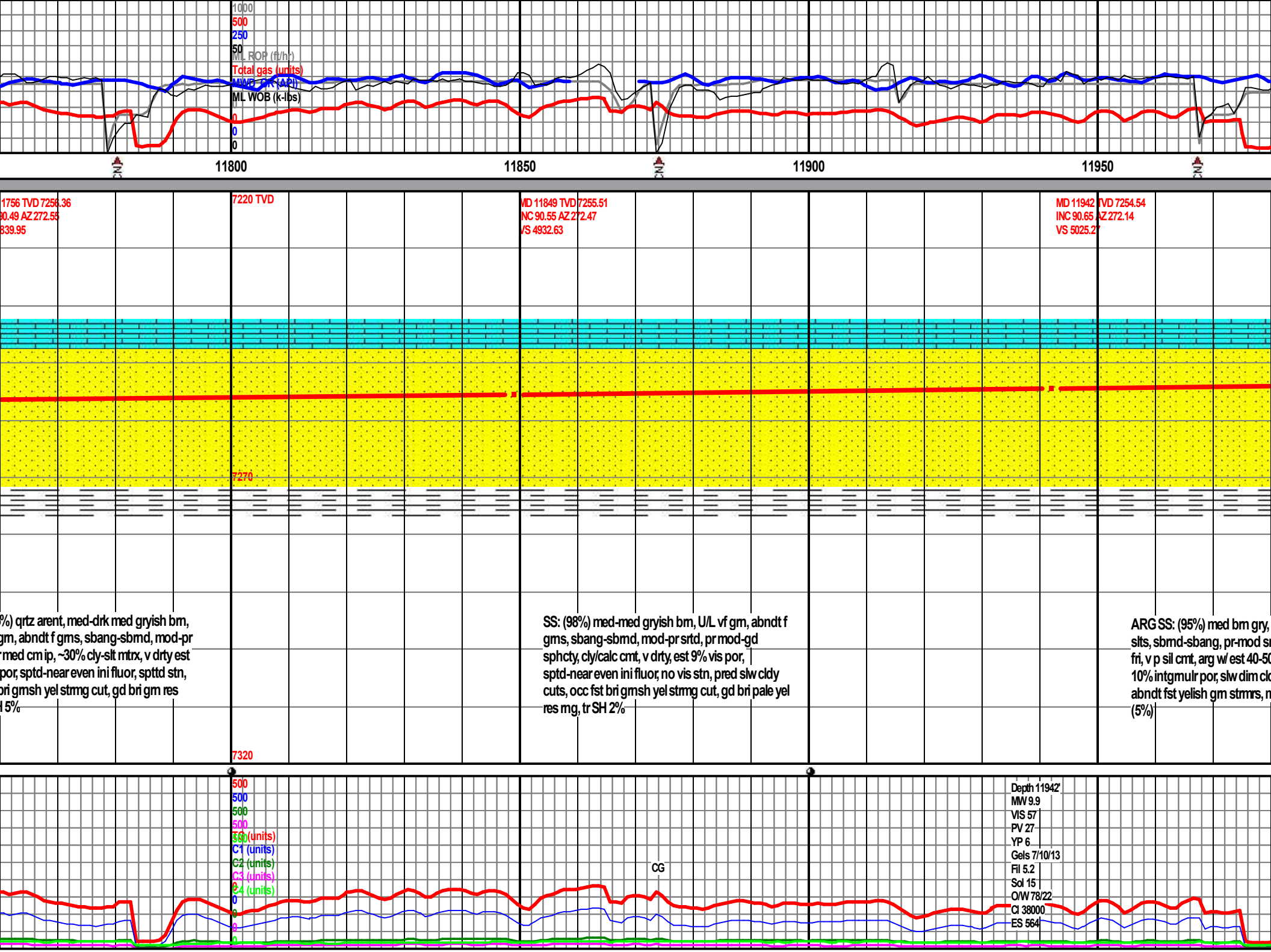

1000
500
250
50
ML ROP (ft/hr)
Total gas (units)
MWD_GR (API)
ML WOB (k-lbs)
0
0
0
10700
10750
10800
10850
MD 10731 TVD 7260.1
INC 90.49 AZ 267.93
VS 3825.28
7220 TVD
MD 10826 TVD 7259.74
INC 89.94 AZ 267.75
VS 3919
Fault #2 @ 10,800' MD ~7' Up
7270
7320
0%) crm-tan, occ lt-med brn, srwrly
en mtx, tblr cuttngs, sbconcdl frac
mic xln, frm-hd, SH: (40%) dk gry-lt blk,
ty cttngs, erthy txt, frm-sl hd, slty ip, SS:
slw blmng blu gm ct flor, mod dul gm
f fl
LS: (80%) crm-tan, occ lt-med brn, srwrly
uneven mtx, tblr cuttngs, sbconcdl frac
pttm, mic xln, frm-hd, SH: (20%) dk gry-lt blk,
tblr plty cttngs, erthy txt, frm-sl hd, slty ip, slw
blmng blu gm ct flor, mod dul gm rsd mf fl,
abndt SS
SS: (70%) brn gry - lt brn gry, v
sub-ang, dom mod sphrcty, fr
mtrx sprt, com cly mtrx, frble-m
por, evn stn, gd bri gm blu cut
rsd fl, PINK stn with AR, abndt
500
500
500
500
500
(units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)
0
0
0
0

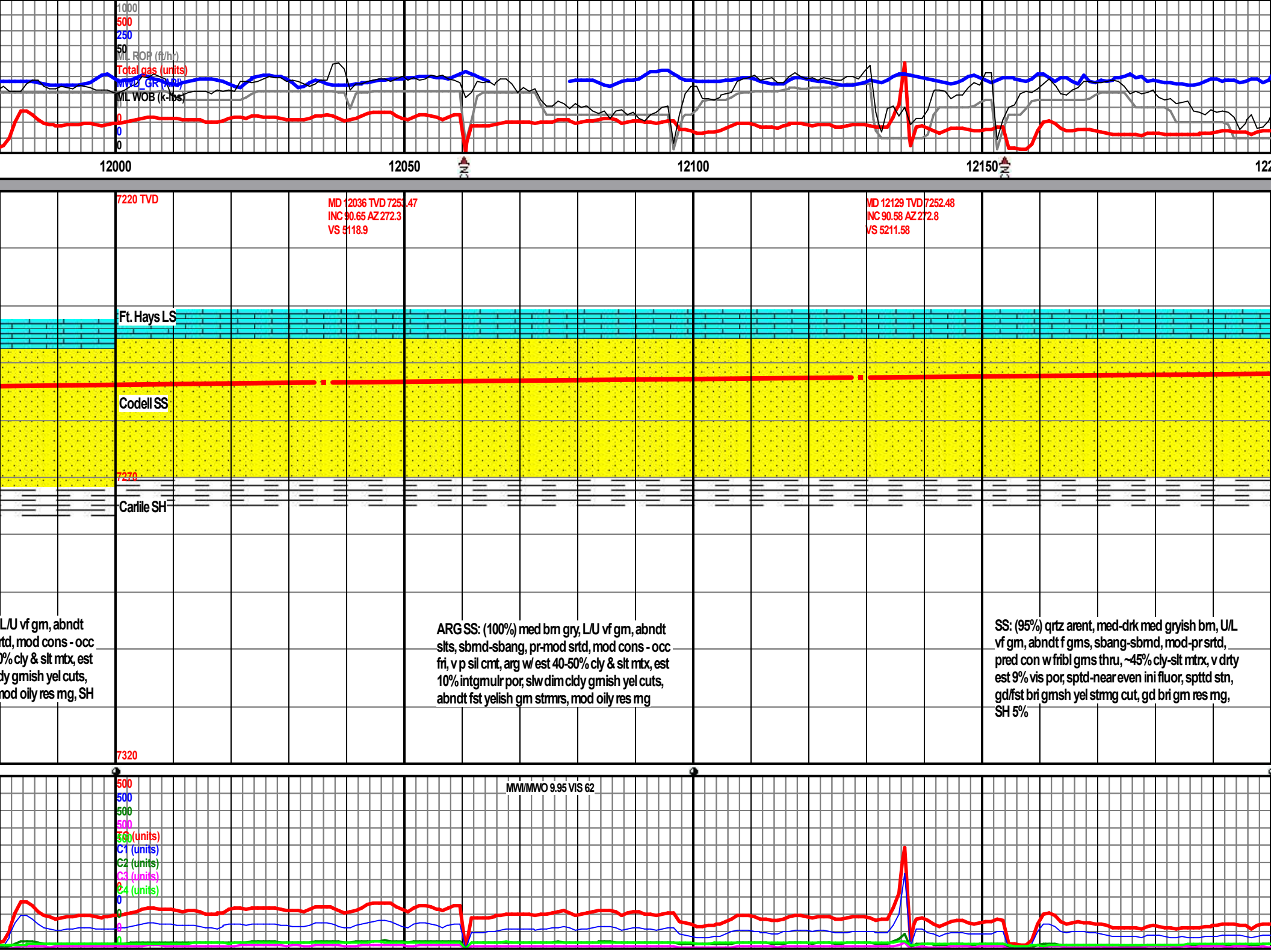

4/22/2018
1000
500
250
50
ML ROP (ft/hr)
Total gas (units)
MWD_GR (API)
ML WOB (k-lbs)
0
0
0
10900
10950
11000
11050
7220 TVD
MD 11012 TVD 7259.64
INC 90.12 AZ 264.71
VS 4101.53
Ft. Hays LS
Codell SS
7270
Carlile SH
fn - fn gmd, dom
srtg, gm sprt w/occ
od hrd, est 10% pp
fl, v gd mod-bri gm
SH, LS (30%)
SS: (80%) brn gry - lt brn gry, v fn - fn gmd, dom sub-ang, dom mod sphrcty, fr srtg, gm sprt w/occ mtrx sprt, com cly mtrx, frble-mod hrd, est 10% pp por, evn stn, gd bri gm blu cut fl, v gd mod-bri gm rsd fl, abndt SH, LS (20%)
SS: (95%) brn gry - lt brn gry, v fn - fn gmd, dom sub-ang gm, dom mod sphrcty, fr-mod srtg, gm sprt w/occ mtrx sprt, com cly mtrx, frble-mod hrd, est 8% pp por, evn stn, gd bri gm blu cut fl, v gd mod-bri gm rsd fl, LS (5%)
7320
MWI/MWO 9.85 VIS 59
500
500
500
500
C1 (units)
C2 (units)
C3 (units)
C4 (units)
0
0
0
0
CG

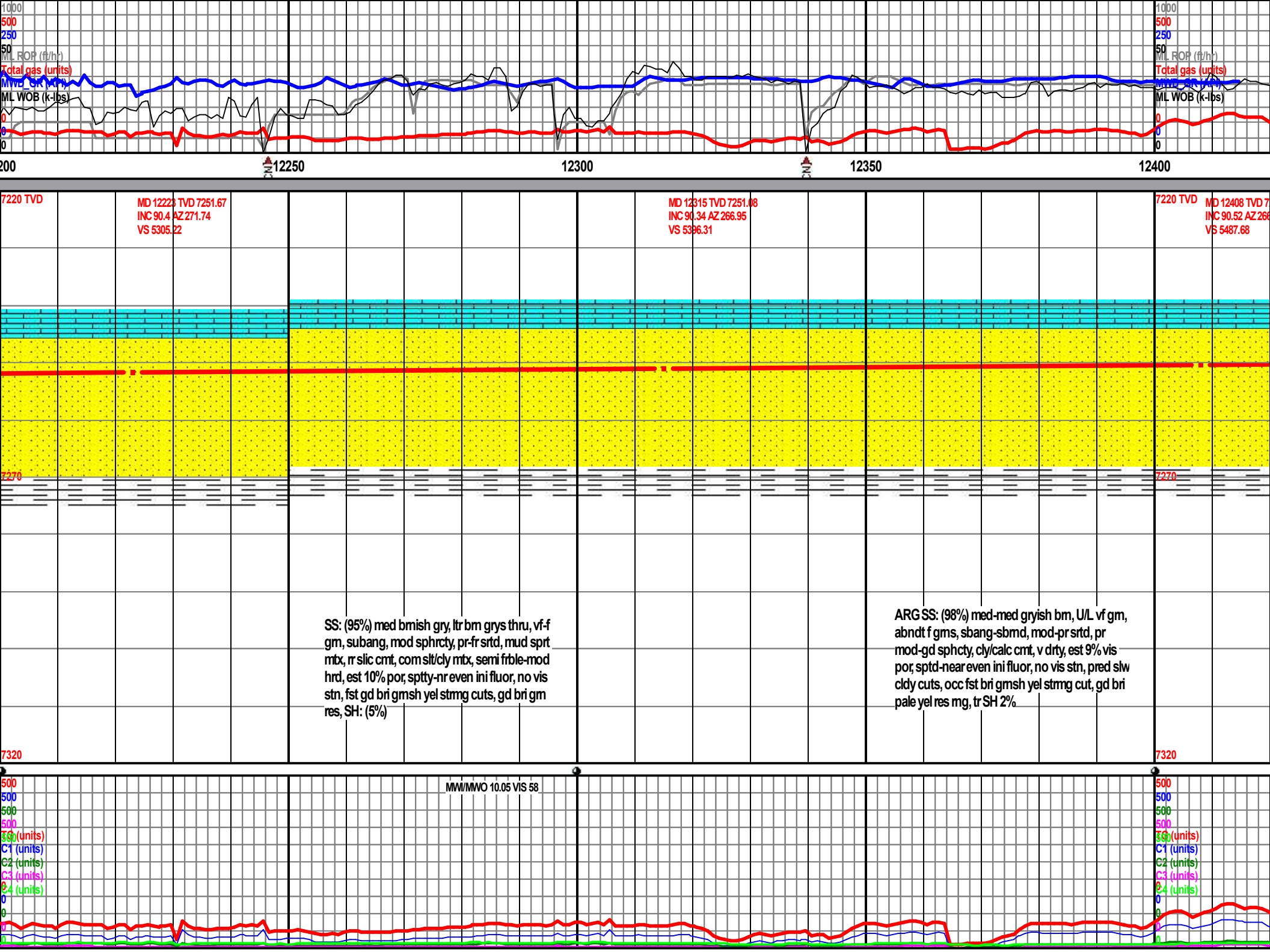

1000
500
250
50
ML ROP (ft/hr)
Total gas (units)
MWD_GR (API)
ML WOB (k-lbs)
0
0
0
100
11150
11200
11250
11300
MD 11105 TVD 7259.47
INC 90.09 AZ 265.23
VS 4192.4
MD 11198 TVD 7259.37
INC 90.03 AZ 267.55
VS 4283.72
MD 11291 TVD 7259.4
INC 89.94 AZ 270.7
VS 4375.77
7270
7320
SS: (95%) med brnish gry, ltr brn grys thru, vf-f gm, subang, mod sphrcty, pr-fr srtd, mud sprt mtx, rr slic cmt, com slt/cly mtx, semi frble-mod hrd, est 8% por, sptty-nr even ini fluor, no vis stn, fst gd bri gmsh yel stmg cuts, gd bri gm res, SH: (5%)
SS: (90%) med-drk med gryish brn, vf gm, sbang-sbrnd, mod srtd,, ~60% cly-slt mtrx brdmg on sndy slttstn, v drty est 7% vis por, mod calc, sptd-near even ini fluor, spttd stn, gd/fst bri gmsh yel cut, gd bri gm res mg, SH 10%
MWI/MWO 9.8 VIS 65
500
500
500
500
C1 (units)
C2 (units)
C3 (units)
C4 (units)
0
0
0

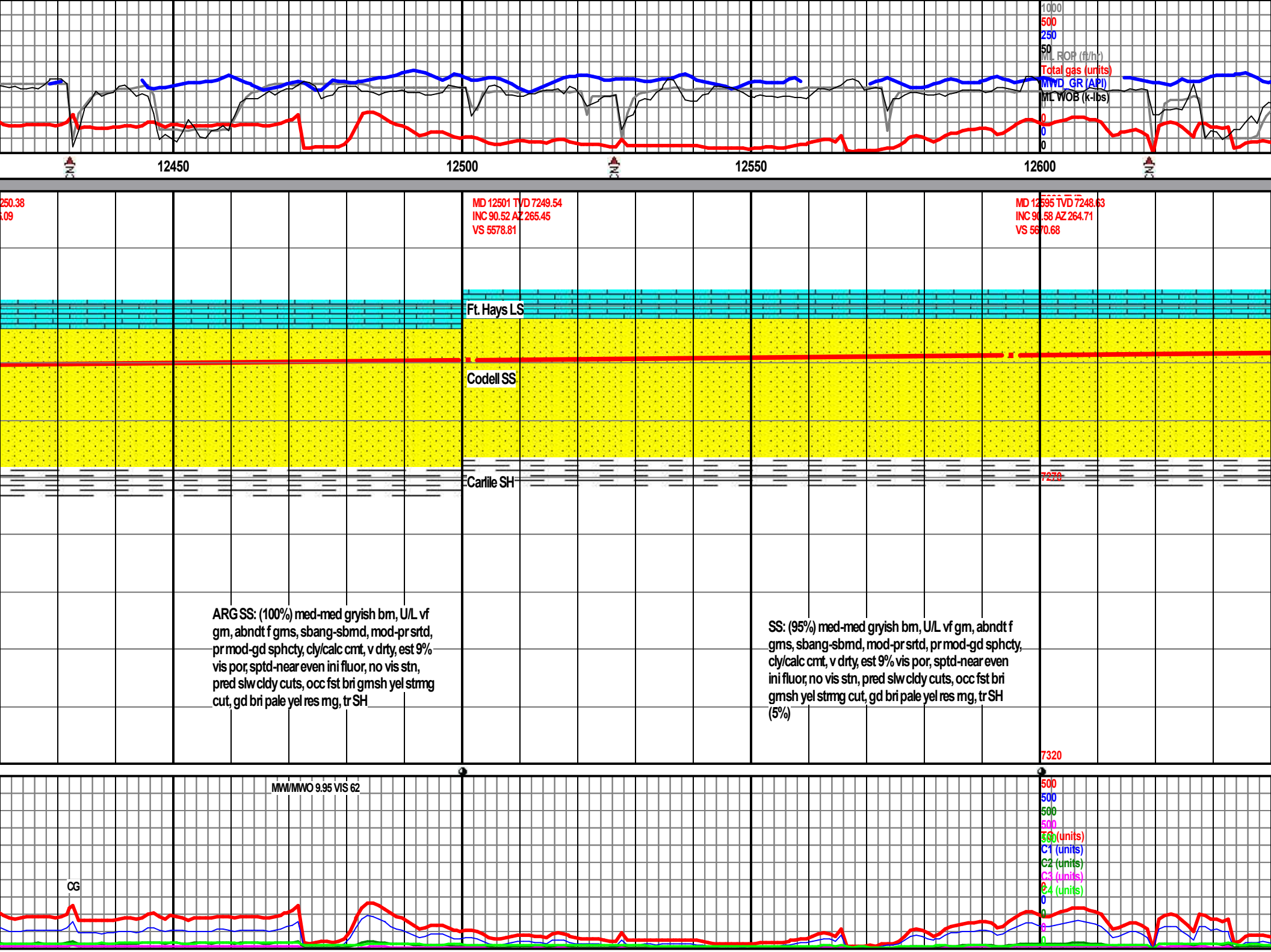

1000
500
250
50
ML ROP (ft/hr)
Total gas (units)
MWD_GR (API)
ML WOB (k-lbs)
0
0
0
11350
11400
11450
11500
MD 11385 TVD 7259.
INC 90.43 AZ 274.4
VS 4469.44
7220 TVD
MD 11478 TVD 7258.35
INC 90.49 AZ 275.34
VS 4562.35
Ft. Hays LS
Codell SS
7270
Carlile SH
SS: (85%) lt med-med gryish brn-lt gryish tan, U/L vf gm, abndt f gms th sbang-sbrnd, mod-pr srtd, pr med cm ip, 40% calc cmt, 60% cly cmt, v drty est 7% vis por, sptd-near even ini fluor, sptd stn, gd/fst bri gmsh yel strmg cut, gd bri gm res mg, incrsng SH 15%
SS: (95%) qrtz arent, med-drk med gryish brn, U/L vf gm, abndt f gms, sbang-sbrnd, mod-pr srtd, pr med cm ip, ~30% cly-slt mtrx, v drty est 9% vis por, sptd-near even ini fluor, sptd stn, gd/fst bri gmsh yel strmg cut, gd bri gm res mg, SH 5%
7320
MW/MWO 9.75 VIS 62
500
500
500
500
C1 (units)
C2 (units)
C3 (units)
0
0
0

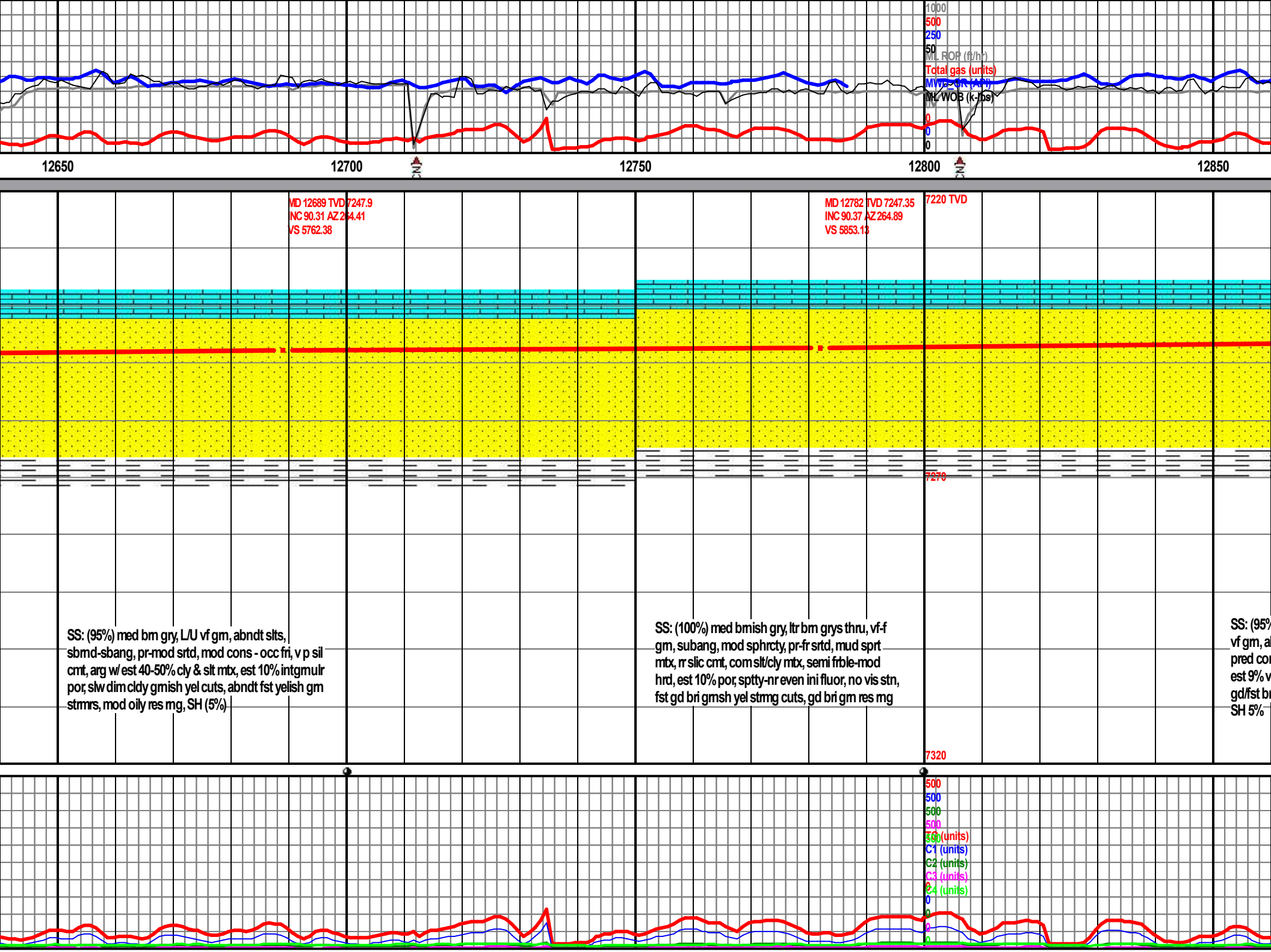

1000
500
250
50
ML ROP (ft/hr)
Total gas (units)
MWD_GR (API)
ML WOB (k-lbs)
0
0
0
11550
11600
11650
11700
11750
MD 11571 TVD 7257.63
INC 90.4 AZ 275.36
VS 4655.3
7220 TVD
MD 11663 TVD 7257.03
INC 90.34 AZ 273.86
VS 4747.19
7270
ARG SS: (100%) med brn gry, L/U vf gm, abndt slts, sbmd-sbang, pr-mod srtd, mod cons - occ fri, v p sil cmt, arg w/ est 40-50% cly & slt mtx, est 10% intgrnulr por, fst wk wht cut fl w/mod ylwsh stmrs, wk-mod resid rng fl, SH (occ)
SS: (95%) qrtz arent, med-drk med gryish brn, U/L vf gm, abndt f grns, sbang-sbmd, mod-pr srtd, pr med cmt ip, ~30% cly-slt mtrx, v drty est 9% vis por, sptd-near even ini fluor, spttd stn, gd/fst bri grnsh yel strmg cut, gd bri gm res rng, SH 5%
7320
500
500
500
500
C1 (units)
C2 (units)
C3 (units)
C4 (units)
0
0
0
MWI/MWO 9.9 VIS 57

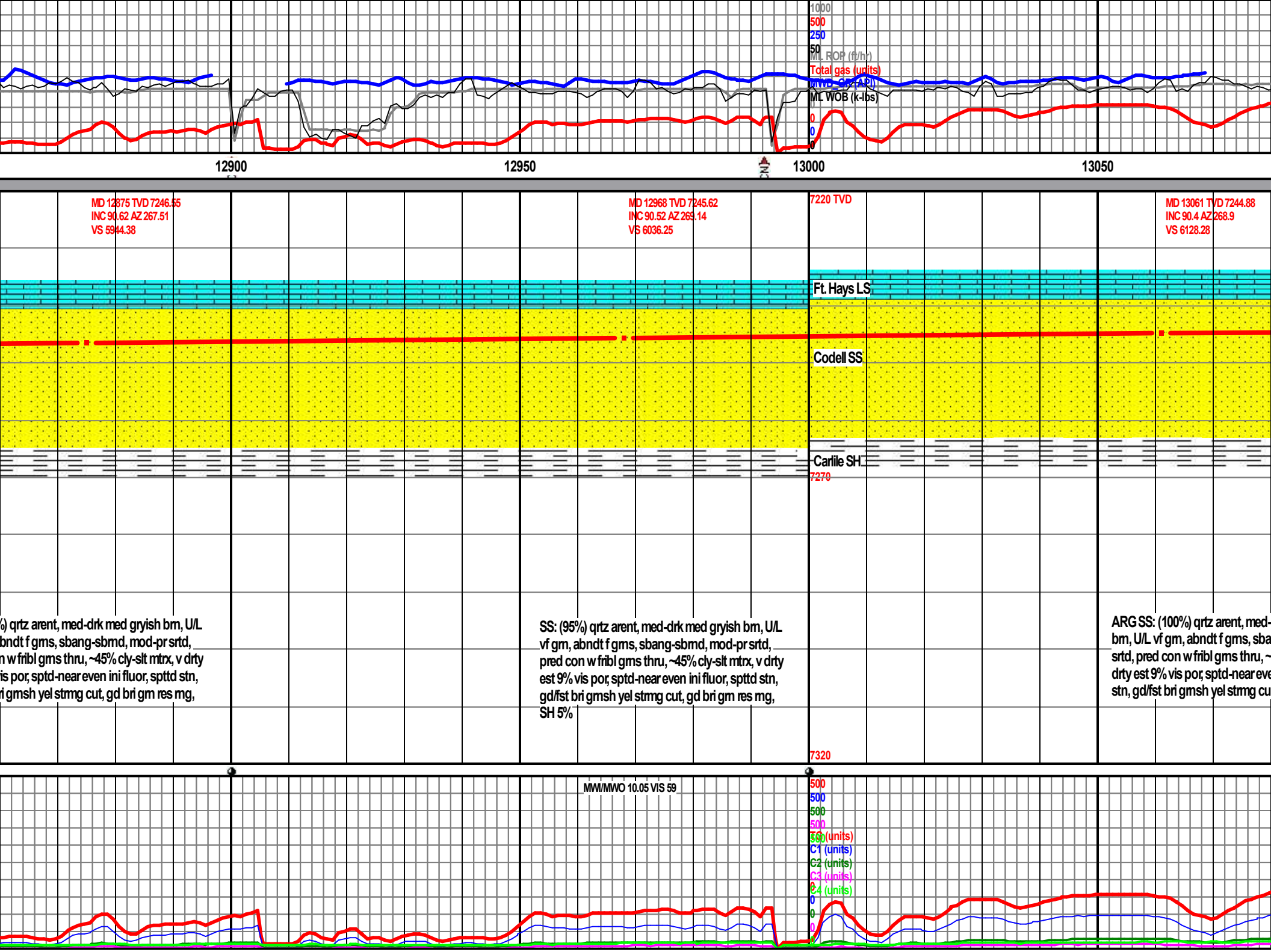

1000
500
250
50
ML ROP (ft/hr)
Total gas (units)
MWD GR (API)
ML WOB (k-lbs)
0
0
0
11800
11850
11900
11950
1756 TVD 7256.36
90.49 AZ 272.55
839.95
7220 TVD
MD 11849 TVD 7255.51
INC 90.55 AZ 272.47
VS 4932.63
MD 11942 TVD 7254.54
INC 90.65 AZ 272.14
VS 5025.27
7270
%) qrtz arent, med-drk med gryish brn,
gm, abndt f gms, sbang-sbrnd, mod-pr
r med cm ip, ~30% cly-slt mtrx, v drty est
por, sptd-near even ini fluor, spttd stn,
bri gmsh yel strmg cut, gd bri gm res
l 5%
SS: (98%) med-med gryish brn, U/L vf gm, abndt f
gms, sbang-sbrnd, mod-pr srtd, pr mod-gd
sphcty, cly/calc cmt, v drty, est 9% vis por,
sptd-near even ini fluor, no vis stn, pred slw cldy
cuts, occ fst bri gmsh yel strmg cut, gd bri pale yel
res mg, tr SH 2%
ARG SS: (95%) med brn gry,
slts, sbrnd-sbang, pr-mod s
fri, v p sil cmt, arg w/ est 40-5
10% intgrnulr por, slw dim cl
abndt fst yelish gm strmrs, r
(5%)
7320
500
500
500
500
C1 (units)
C2 (units)
C3 (units)
C4 (units)
0
0
0
CG
Depth 11942'
MW 9.9
VIS 57
PV 27
YP 6
Gels 7/10/13
Fil 5.2
Sol 15
O/W 78/22
Cl 38000
ES 564

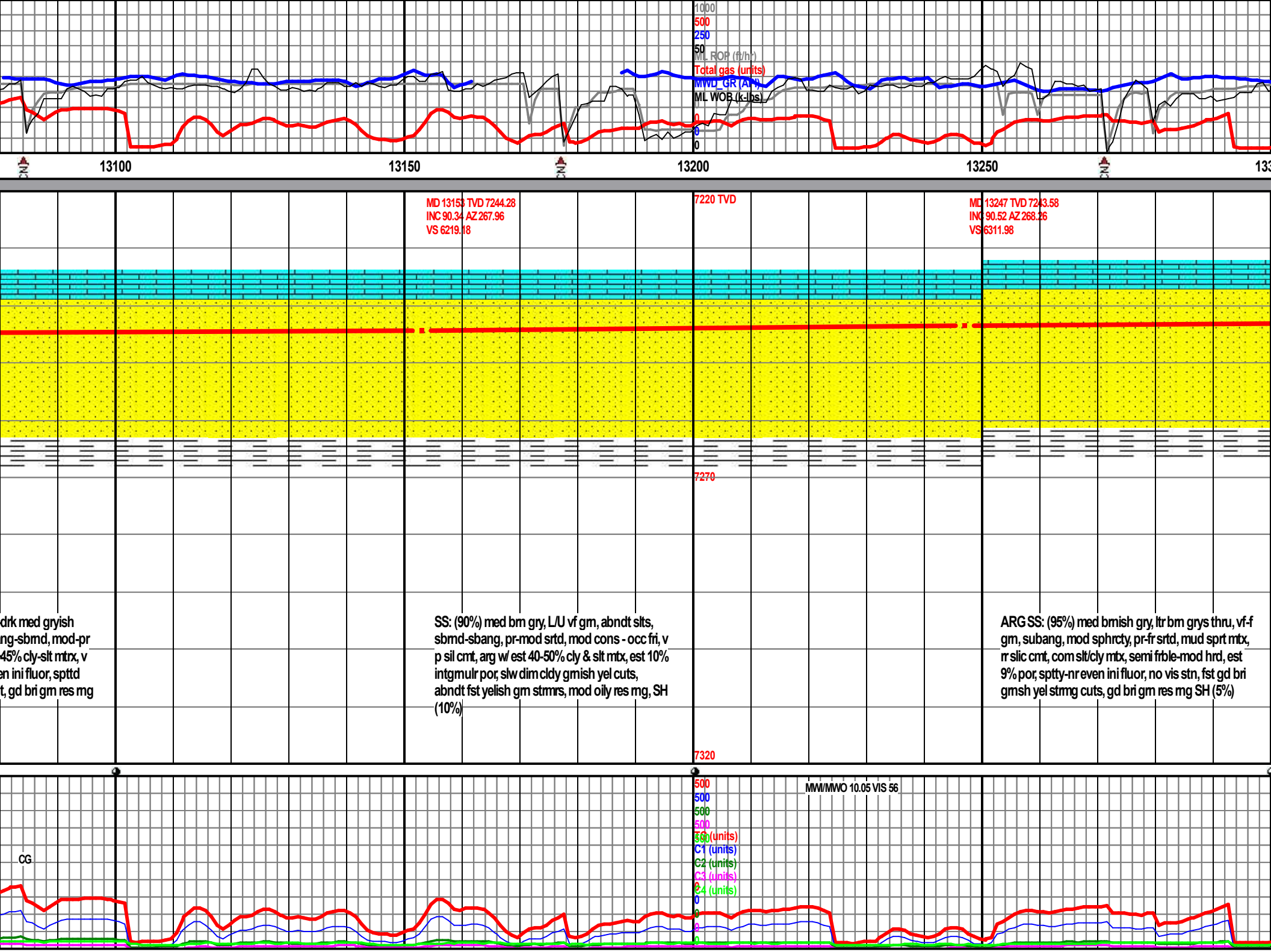

1000
500
250
50
ML ROP (ft/h')
Total gas (units)
MWD_GR (API)
ML WOB (k-lbs)
0
0
0
12000
12050
12100
12150
7220 TVD
MD 12036 TVD 7253.47
INC 90.65 AZ 272.3
VS 5118.9
MD 12129 TVD 7252.48
INC 90.58 AZ 272.8
VS 5211.58
Ft. Hays LS
Codell SS
7270
Carlile SH
L/U vf gm, abndt
rtd, mod cons - occ
0% cly & slt mtx, est
dy gmish yel cuts,
nod oily res mg, SH
ARG SS: (100%) med brn gry, L/U vf gm, abndt
slts, sbrnd-sbang, pr-mod srtd, mod cons - occ
fri, v p sil cmt, arg w/ est 40-50% cly & slt mtx, est
10% intgrnulr por, slw dim cldy gmish yel cuts,
abndt fst yelish gm strmrs, mod oily res mg
SS: (95%) qrtz arent, med-drk med gryish brn, U/L
vf gm, abndt f gms, sbang-sbrnd, mod-pr srtd,
pred con w fribl gms thru, ~45% cly-slt mtrx, v drty
est 9% vis por, sptd-near even ini fluor, spttd stn,
gd/fst bri gmsh yel strmg cut, gd bri gm res mg,
SH 5%
7320
500
500
500
500
Total (units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)
0
0
0
0
MWI/MWO 9.95 VIS 62

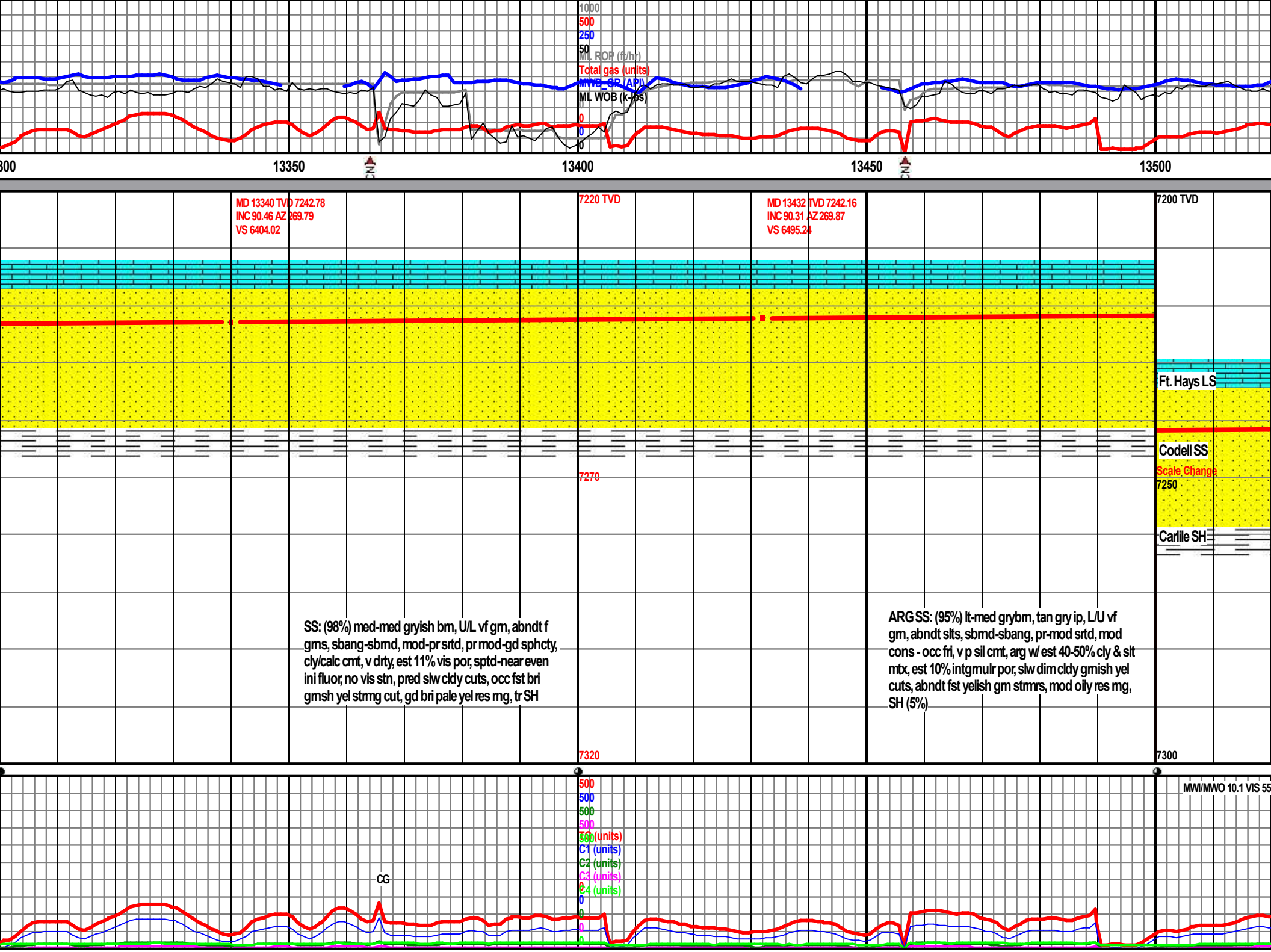

ML ROP (ft/hr)
Total gas (units)
MWD_GR (API)
ML WOB (k-lbs)
12250
12300
12350
12400
7220 TVD
MD 12223 TVD 7251.67
INC 90.4 AZ 271.74
VS 5305.22
MD 12315 TVD 7251.08
INC 90.34 AZ 266.95
VS 5396.31
MD 12408 TVD 7
INC 90.52 AZ 266
VS 5487.68
7270
7320
SS: (95%) med brnish gry, ltr brn grys thru, vf-f gm, subang, mod sphrcty, pr-fr srtd, mud sprt mtx, rr slic cmt, com slt/cly mtx, semi frble-mod hrd, est 10% por, sptty-nr even ini fluor, no vis stn, fst gd bri grnsh yel strmg cuts, gd bri gm res, SH: (5%)
ARG SS: (98%) med-med gryish brn, U/L vf gm, abndt f gms, sbang-sbrnd, mod-pr srtd, pr mod-gd sphcty, cly/calc cmt, v drty, est 9% vis por, sptd-near even ini fluor, no vis stn, pred slw cldy cuts, occ fst bri grnsh yel strmg cut, gd bri pale yel res mg, tr SH 2%
MW/MWO 10.05 VIS 58
C1 (units)
C2 (units)
C3 (units)
C4 (units)

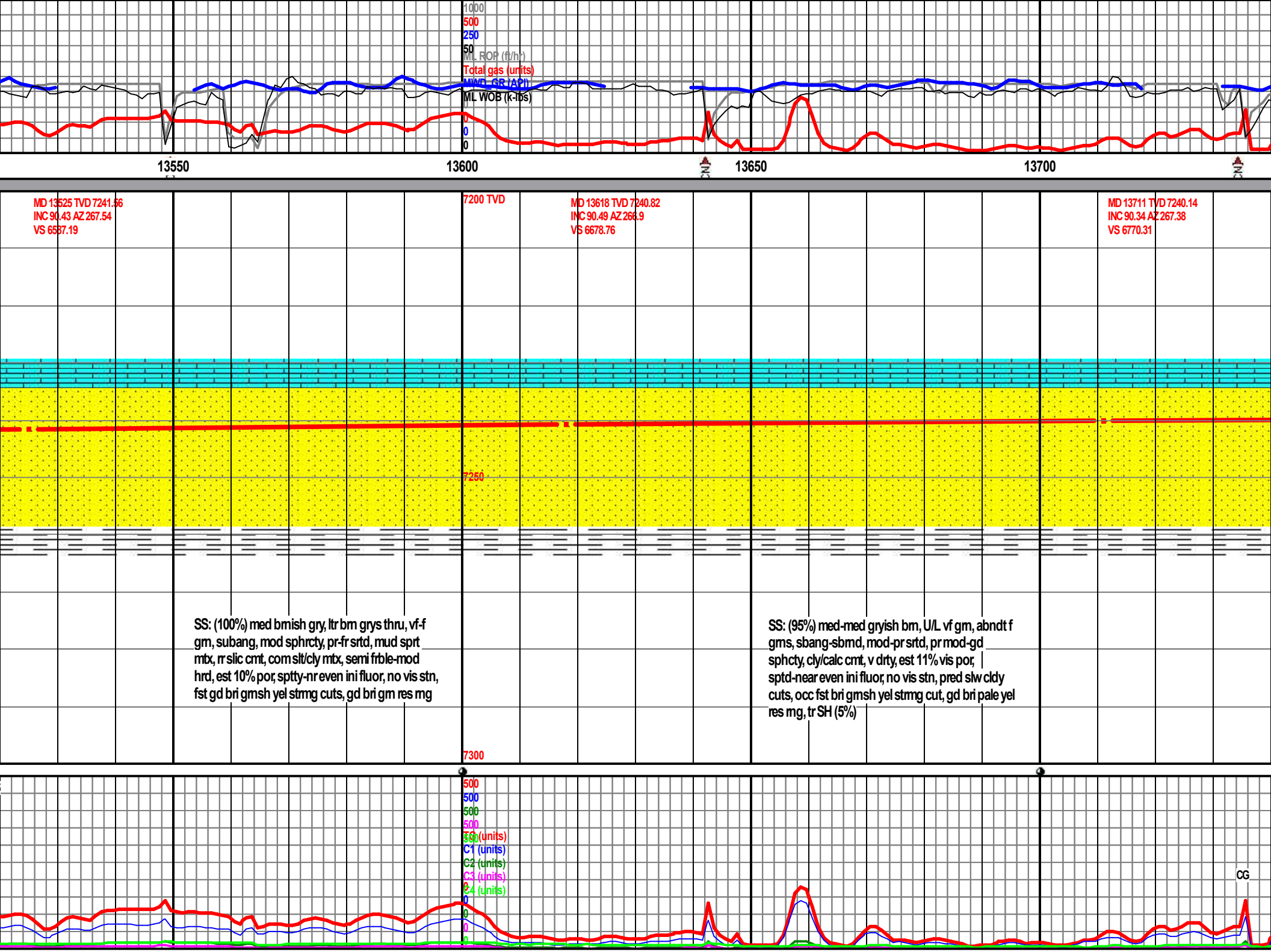

1000
500
250
50
ML ROP (ft/hr)
Total gas (units)
MWD GR (API)
ML WOB (k-lbs)
0
0
0
12450
12500
12550
12600
MD 12501 TVD 7249.54
INC 90.52 AZ 265.45
VS 5578.81
MD 12595 TVD 7248.63
INC 90.58 AZ 264.71
VS 5670.68
Ft. Hays LS
Codell SS
Carlile SH
7270
ARG SS: (100%) med-med gryish brn, U/L vf gm, abndt f gms, sbang-sbmd, mod-pr srtd, pr mod-gd sphcty, cly/calc cmt, v drty, est 9% vis por, sptd-near even ini fluor, no vis stn, pred slw cldy cuts, occ fst bri gmsh yel stmg cut, gd bri pale yel res rng, tr SH
SS: (95%) med-med gryish brn, U/L vf gm, abndt f gms, sbang-sbmd, mod-pr srtd, pr mod-gd sphcty, cly/calc cmt, v drty, est 9% vis por, sptd-near even ini fluor, no vis stn, pred slw cldy cuts, occ fst bri gmsh yel stmg cut, gd bri pale yel res rng, tr SH (5%)
7320
MW/MWO 9.95 VIS 62
CG
500
500
500
500
C1 (units)
C2 (units)
C3 (units)
C4 (units)
0
0
0
0

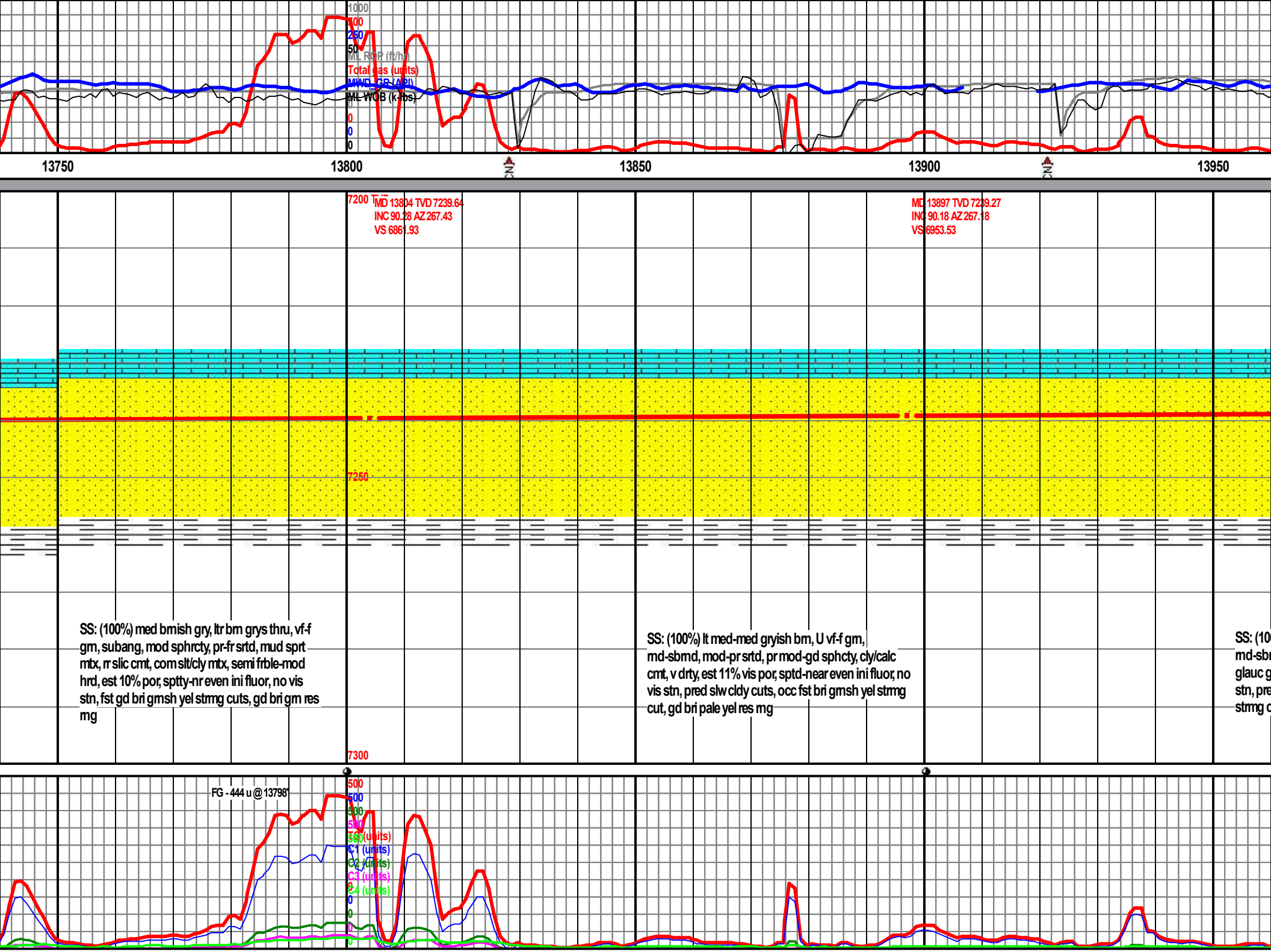

1000
500
250
50
ML ROP (ft/h')
Total gas (units)
MWD GR (API)
ML WOB (k-lbs)
0
0
0
12650
12700
12750
12800
12850
MD 12689 TVD 7247.9
INC 90.31 AZ 264.41
VS 5762.38
MD 12782 TVD 7247.35
INC 90.37 AZ 264.89
VS 5853.13
7220 TVD
7270
7320
SS: (95%) med brn gry, L/U vf gm, abndt slts, sbrnd-sbang, pr-mod srtd, mod cons - occ fri, v p sil cmt, arg w/ est 40-50% cly & slt mtx, est 10% intgrnulr por, slw dim cldy gmish yel cuts, abndt fst yelish gm stmrs, mod oily res rng, SH (5%)
SS: (100%) med brnish gry, ltr brn grys thru, vf-f gm, subang, mod sphrcty, pr-fr srtd, mud sprt mtx, rr slic cmt, com slt/cly mtx, semi frble-mod hrd, est 10% por, sptty-nr even ini fluor, no vis stn, fst gd bri gmsh yel stmg cuts, gd bri gm res rng
SS: (95%
vf gm, a
pred co
est 9% v
gd/fst br
SH 5%
500
500
500
500
(units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)
0
0
0
0

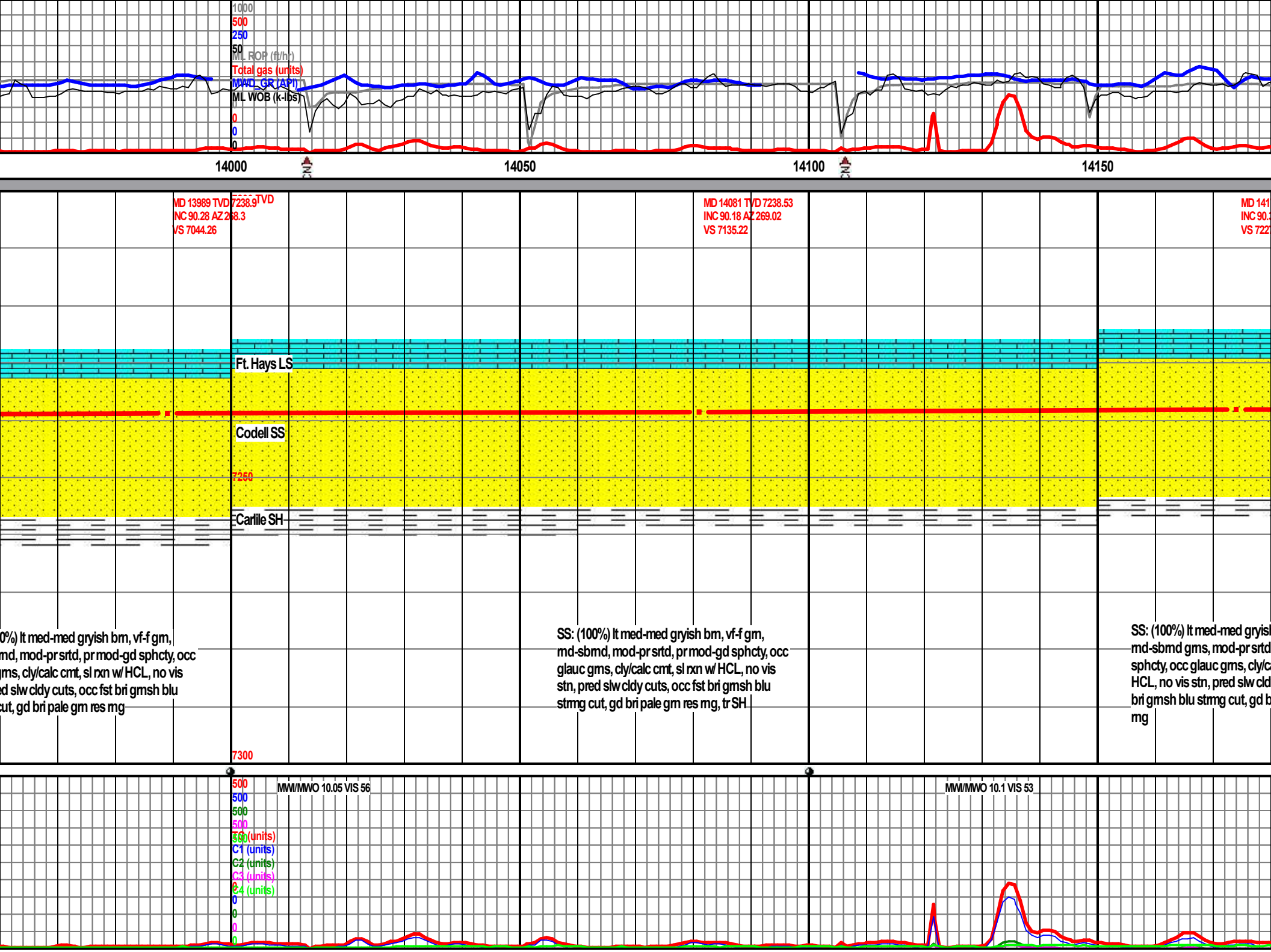

1000
500
250
50
ML ROP (ft/hr)
Total gas (units)
MWD_GR (API)
ML WOB (k-lbs)
0
0
0
12900
12950
13000
13050
MD 12875 TVD 7246.55
INC 90.62 AZ 267.51
VS 5944.38
MD 12968 TVD 7245.62
INC 90.52 AZ 269.14
VS 6036.25
7220 TVD
MD 13061 TVD 7244.88
INC 90.4 AZ 268.9
VS 6128.28
Ft. Hays LS
Codell SS
Carlile SH
7270
7320
) qrtz arent, med-drk med gryish brn, U/L
bndt f gms, sbang-sbmd, mod-pr srtd,
n w fribl gms thru, ~45% cly-slt mtrx, v drty
is por, sptd-near even ini fluor, spttd stn,
i gmsh yel strmg cut, gd bri gm res mg,
SS: (95%) qrtz arent, med-drk med gryish brn, U/L
vf gm, abndt f gms, sbang-sbmd, mod-pr srtd,
pred con w fribl gms thru, ~45% cly-slt mtrx, v drty
est 9% vis por, sptd-near even ini fluor, spttd stn,
gd/fst bri gmsh yel strmg cut, gd bri gm res mg,
SH 5%
ARG SS: (100%) qrtz arent, med-
brn, U/L vf gm, abndt f gms, sba
srtd, pred con w fribl gms thru, ~
drty est 9% vis por, sptd-near eve
stn, gd/fst bri gmsh yel strmg cu
MWI/MWO 10.05 VIS 59
500
500
500
500
500
(units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)
0
0
0

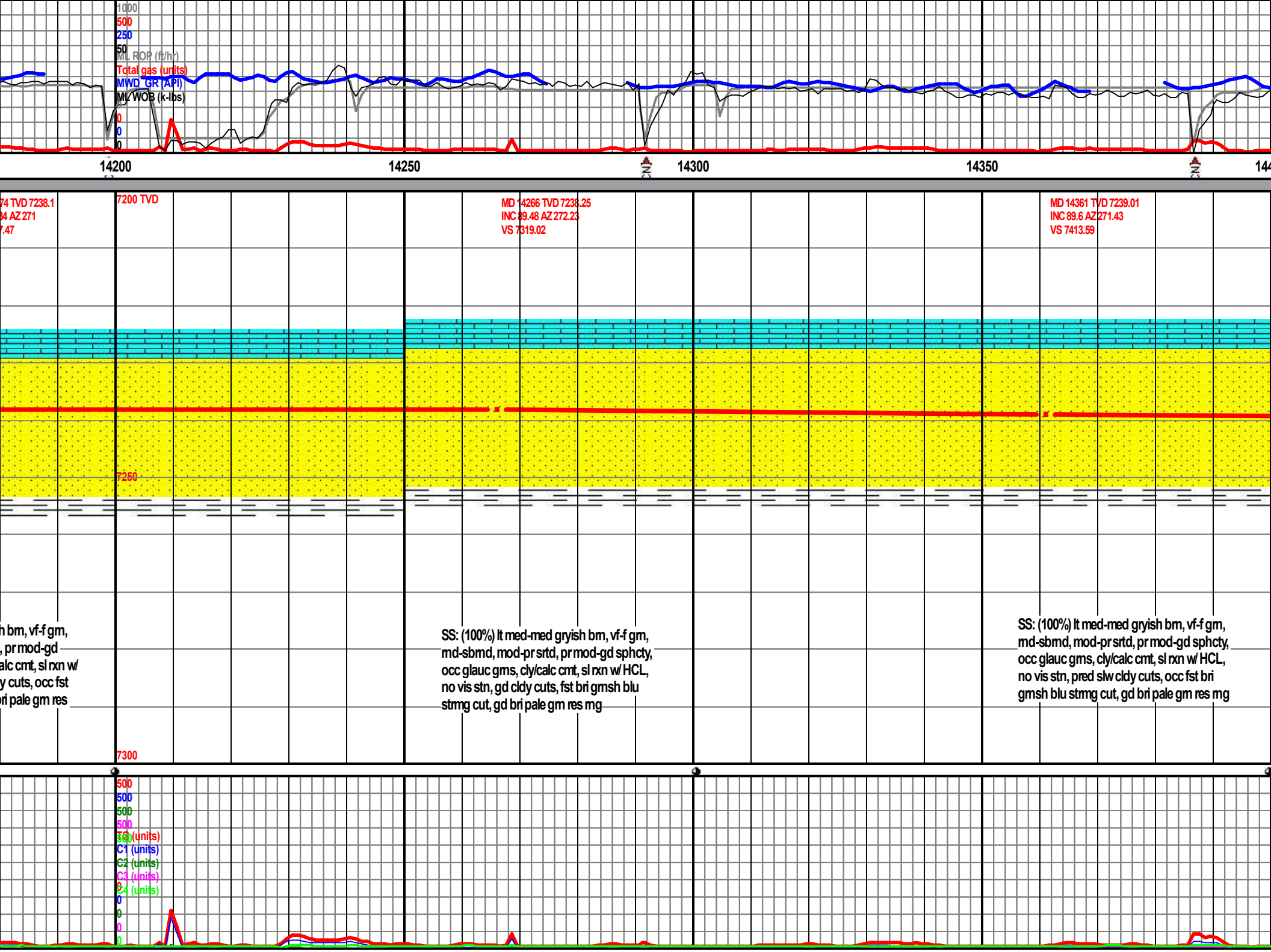

1000
500
250
50
ML ROP (ft/hr)
Total gas (units)
MWD_GR (API)
ML WOB (k-lbs)
0
0
0
13100
13150
13200
13250
MD 13153 TVD 7244.28
INC 90.34 AZ 267.96
VS 6219.18
7220 TVD
MD 13247 TVD 7243.58
INC 90.52 AZ 268.26
VS 6311.98
7270
7320
drk med gryish
ng-sbrnd, mod-pr
45% cly-slt mtrx, v
en ini fluor, spttd
t, gd bri gm res mg
SS: (90%) med brn gry, L/U vf gm, abndt slts,
sbrnd-sbang, pr-mod srtd, mod cons - occ fri, v
p sil cmt, arg w/ est 40-50% cly & slt mtx, est 10%
intgrnulr por, slw dim cldy gmish yel cuts,
abndt fst yelish gm strnrs, mod oily res mg, SH
(10%)
ARG SS: (95%) med brnish gry, ltr brn grys thru, vf-f
gm, subang, mod sphrcty, pr-fr srtd, mud sprt mtx,
rr slic cmt, com slt/cly mtx, semi frble-mod hrd, est
9% por, sptty-nr even ini fluor, no vis stn, fst gd bri
gmsh yel strmg cuts, gd bri gm res mg SH (5%)
CG
500
500
500
500
C1 (units)
C2 (units)
C3 (units)
C4 (units)
0
0
0
MW/MWO 10.05 VIS 56

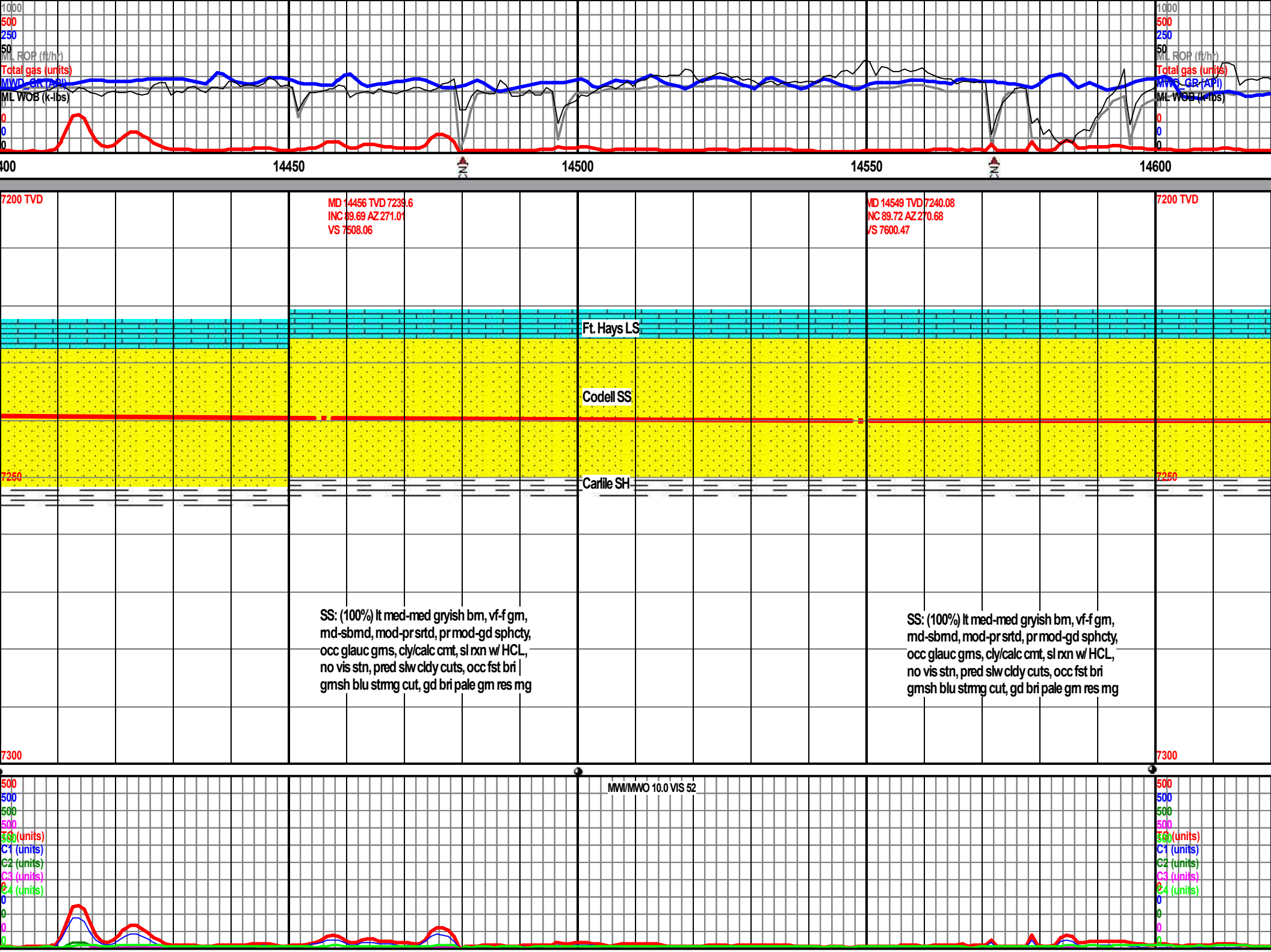

1000
500
250
50
ML ROP (ft/hr)
Total gas (units)
MWD_GR (API)
ML WOB (k-lbs)
0
0
0
300
13350
CN
13400
13450
CN
13500
MD 13340 TVD 7242.78
INC 90.46 AZ 269.79
VS 6404.02
7220 TVD
MD 13432 TVD 7242.16
INC 90.31 AZ 269.87
VS 6495.24
7200 TVD
Ft. Hays LS
Codell SS
Scale Change
7250
Carlile SH
7270
SS: (98%) med-med gryish brn, U/L vf grn, abndt f grns, sbang-sbrnd, mod-pr srtd, pr mod-gd sphcty, cly/calc cmt, v drty, est 11% vis por, sptd-near even ini fluor, no vis stn, pred slw cldy cuts, occ fst bri grnsh yel strmg cut, gd bri pale yel res rng, tr SH
ARG SS: (95%) lt-med grybrn, tan gry ip, L/U vf gm, abndt slts, sbrnd-sbang, pr-mod srtd, mod cons - occ fri, v p sil cmt, arg w/ est 40-50% cly & slt mtx, est 10% intgrnulr por, slw dim cldy grnish yel cuts, abndt fst yelish gm strmrs, mod oily res rng, SH (5%)
7320
7300
500
500
500
500
C1 (units)
C2 (units)
C3 (units)
C4 (units)
0
0
0
0
CG
MW/MWO 10.1 VIS 55

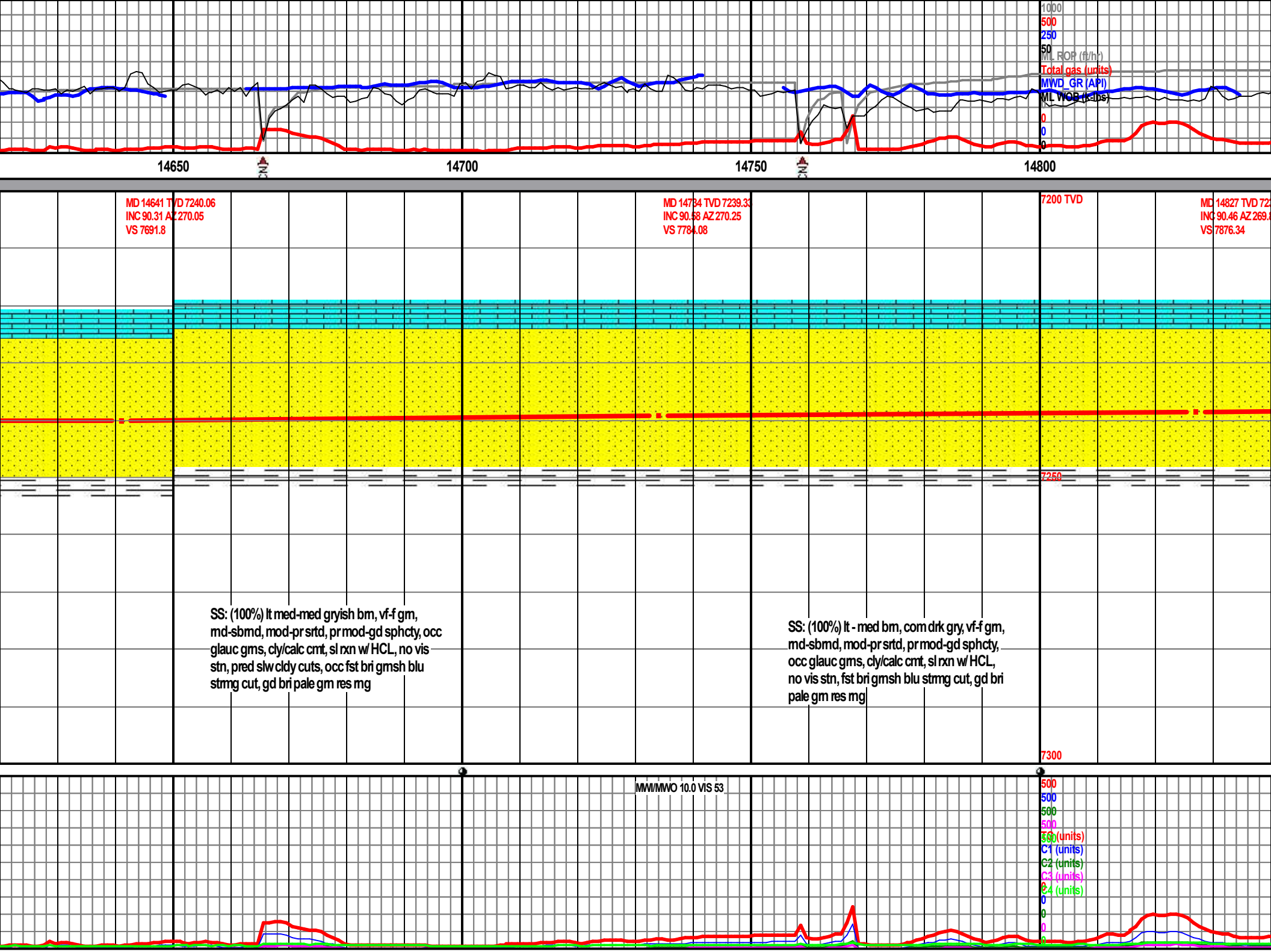

1000
500
250
50
ML ROP (ft/hr)
Total gas (units)
MWD_GR (API)
ML WOB (k-lbs)
0
0
0
13550
13600
13650
13700
MD 13525 TVD 7241.56
INC 90.43 AZ 267.54
VS 6587.19
7200 TVD
MD 13618 TVD 7240.82
INC 90.49 AZ 266.9
VS 6678.76
MD 13711 TVD 7240.14
INC 90.34 AZ 267.38
VS 6770.31
7250
SS: (100%) med brnish gry, ltr brn grys thru, vf-f gm, subang, mod sphrcty, pr-fr srtd, mud sprt mtx, rr slic cmt, com slt/cly mtx, semi frble-mod hrd, est 10% por, sptty-nr even ini fluor, no vis stn, fst gd bri gmsh yel strmg cuts, gd bri gm res mg
SS: (95%) med-med gryish brn, U/L vf gm, abndt f gms, sbang-sbrnd, mod-pr srtd, pr mod-gd sphcty, cly/calc cmt, v drty, est 11% vis por, sptd-near even ini fluor, no vis stn, pred slw cldy cuts, occ fst bri gmsh yel strmg cut, gd bri pale yel res mg, tr SH (5%)
7300
500
500
500
500
Total gas (units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)
0
0
0
0
CG

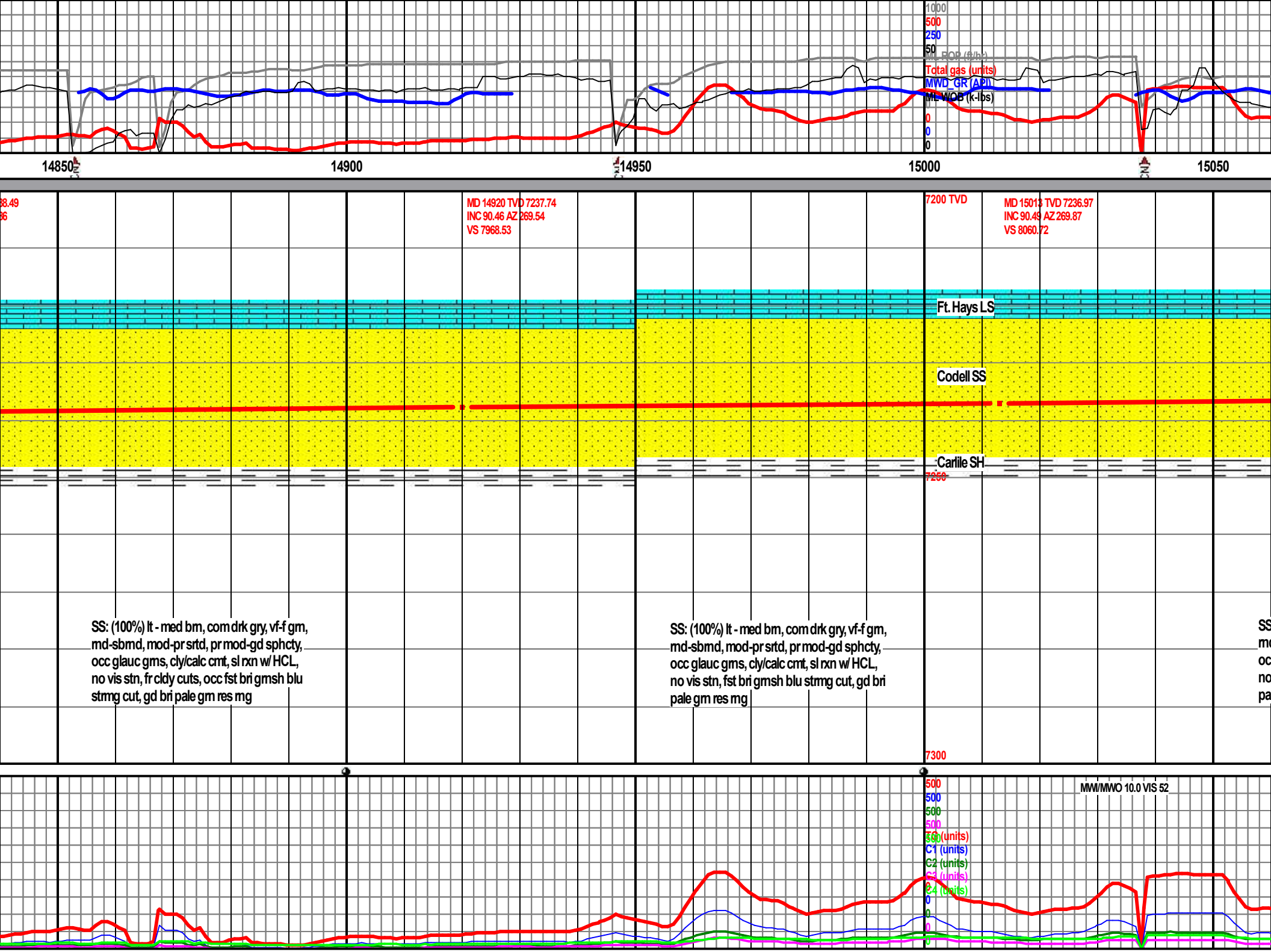

1000
100
250
50
ML ROP (ft/hr)
Total gas (units)
MWD_GR (API)
ML WOB (k-lbs)
0
0
0
13750
13800
13850
13900
13950
7200
MD 13804 TVD 7239.64
INC 90.28 AZ 267.43
VS 6861.93
MD 13897 TVD 7239.27
INC 90.18 AZ 267.18
VS 6953.53
7250
7300
SS: (100%) med brnish gry, ltr brn grys thru, vf-f gm, subang, mod sphrcty, pr-fr srtd, mud sprt mtx, rr slic cmt, com slt/cly mtx, semi frble-mod hrd, est 10% por, sptty-nr even ini fluor, no vis stn, fst gd bri gmsh yel strmg cuts, gd bri gm res mg
SS: (100%) lt med-med gryish brn, U vf-f gm, md-sbrnd, mod-pr srtd, pr mod-gd sphcty, cly/calc cmt, v drty, est 11% vis por, sptd-near even ini fluor, no vis stn, pred slw cldy cuts, occ fst bri gmsh yel strmg cut, gd bri pale yel res mg
SS: (10
md-sbr
glauc g
stn, pre
strmg c
FG - 444 u @ 13798'
500
500
300
100
300 (units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)
0
0
0
0
0

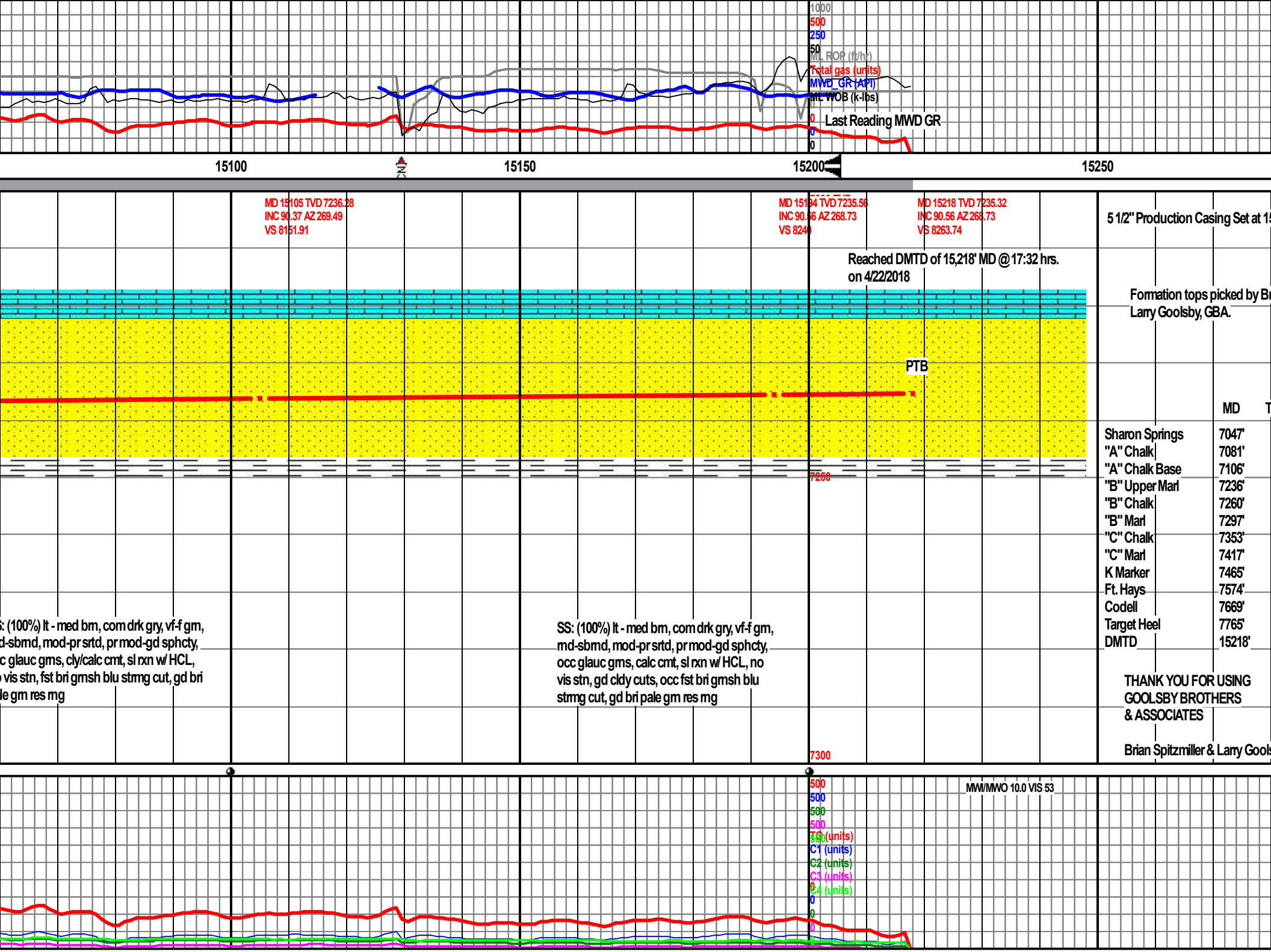

1000
500
250
50
ML ROP (ft/hr)
Total gas (units)
MWD GR (API)
ML WOB (k-lbs)
0
0
0
14000
14050
14100
14150
MD 13989 TVD 7238.9 TVD
INC 90.28 AZ 268.3
VS 7044.26
MD 14081 TVD 7238.53
INC 90.18 AZ 269.02
VS 7135.22
MD 141
INC 90.
VS 722
Ft. Hays LS
Codell SS
7250
Carlile SH
7300
0%) lt med-med gryish brn, vf-f grn,
md, mod-pr srtd, pr mod-gd sphcty, occ
gms, cly/calc cmt, sl rxn w/ HCL, no vis
d slw cldy cuts, occ fst bri gmsh blu
ut, gd bri pale gm res mg
SS: (100%) lt med-med gryish brn, vf-f grn,
md-sbmd, mod-pr srtd, pr mod-gd sphcty, occ
glauc gms, cly/calc cmt, sl rxn w/ HCL, no vis
stn, pred slw cldy cuts, occ fst bri gmsh blu
strmg cut, gd bri pale gm res mg, tr SH
SS: (100%) lt med-med gryish
md-sbmd gms, mod-pr srtd
sphcty, occ glauc gms, cly/c
HCL, no vis stn, pred slw cld
bri gmsh blu strmg cut, gd b
mg
500
500
500
500
MWI/MWO 10.05 VIS 56
MWI/MWO 10.1 VIS 53
C1 (units)
C2 (units)
C3 (units)
C4 (units)
0
0
0
0


1000
500
250
50
ML ROP (ft/h')
Total gas (units)
MWD GR (API)
ML WOB (k-lbs)
0
0
0
14200
14250
14300
14350
74 TVD 7238.1
84 AZ 271
7.47
7200 TVD
MD 14266 TVD 7238.25
INC 89.48 AZ 272.23
VS 7319.02
MD 14361 TVD 7239.01
INC 89.6 AZ 271.43
VS 7413.59
7250
h bm, vf-f gm,
, pr mod-gd
alc cmt, sl rxn w/
y cuts, occ fst
ri pale gm res
SS: (100%) lt med-med gryish bm, vf-f gm, md-sbmd, mod-pr srtd, pr mod-gd sphcty, occ glauc gms, cly/calc cmt, sl rxn w/ HCL, no vis stn, gd cldy cuts, fst bri gmsh blu strmg cut, gd bri pale gm res mg
SS: (100%) lt med-med gryish bm, vf-f gm, md-sbmd, mod-pr srtd, pr mod-gd sphcty, occ glauc gms, cly/calc cmt, sl rxn w/ HCL, no vis stn, pred slw cldy cuts, occ fst bri gmsh blu strmg cut, gd bri pale gm res mg
7300
500
500
500
500
Total (units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)
0
0
0
0


1000
500
250
50
ML ROP (ft/hr)
Total gas (units)
MWD_GR (API)
ML WOB (k-lbs)
0
0
0
400
14450
CN
14500
14550
CN
14600
7200 TVD
MD 14456 TVD 7239.6
INC 89.69 AZ 271.01
VS 7508.06
MD 14549 TVD 7240.08
INC 89.72 AZ 270.68
VS 7600.47
Ft. Hays LS
Codell SS
Carlile SH
7250
SS: (100%) lt med-med gryish brn, vf-f gm,
md-sbrnd, mod-pr srtd, pr mod-gd sphcty,
occ glauc gms, cly/calc cmt, sl rxn w/ HCL,
no vis stn, pred slw cldy cuts, occ fst bri
gmsh blu strmg cut, gd bri pale gm res rng
SS: (100%) lt med-med gryish brn, vf-f gm,
md-sbrnd, mod-pr srtd, pr mod-gd sphcty,
occ glauc gms, cly/calc cmt, sl rxn w/ HCL,
no vis stn, pred slw cldy cuts, occ fst bri
gmsh blu strmg cut, gd bri pale gm res rng
7300
MWI/MWO 10.0 VIS 52
500
500
500
500
C1 (units)
C2 (units)
C3 (units)
C4 (units)
0
0
0


1000
500
250
50
ML ROP (ft/hr)
Total gas (units)
MWD_GR (API)
ML WOB (k-lbs)
0
0
0
14650
CN
14700
14750
CN
14800
MD 14641 TVD 7240.06
INC 90.31 AZ 270.05
VS 7691.8
MD 14734 TVD 7239.33
INC 90.58 AZ 270.25
VS 7784.08
7200 TVD
MD 14827 TVD 72
INC 90.46 AZ 269.
VS 7876.34
7250
SS: (100%) lt med-med gryish brn, vf-f gm, md-sbrnd, mod-pr srtd, pr mod-gd sphcty, occ glauc gms, cly/calc cmt, sl rxn w/ HCL, no vis stn, pred slw cldy cuts, occ fst bri gmsh blu strmg cut, gd bri pale gm res mg
SS: (100%) lt - med brn, com drk gry, vf-f gm, md-sbrnd, mod-pr srtd, pr mod-gd sphcty, occ glauc gms, cly/calc cmt, sl rxn w/ HCL, no vis stn, fst bri gmsh blu strmg cut, gd bri pale gm res mg
7300
MW/MWO 10.0 VIS 53
500
500
500
500
C1 (units)
C2 (units)
C3 (units)
C4 (units)
0
0
0
0


1000
500
250
50
ML ROP (ft/hr)
Total gas (units)
MWD_GR (API)
ML WOB (k-lbs)
0
0
0
14850
14900
14950
15000
15050
MD 14920 TVD 7237.74
INC 90.46 AZ 269.54
VS 7968.53
7200 TVD
MD 15013 TVD 7236.97
INC 90.49 AZ 269.87
VS 8060.72
Ft. Hays LS
Codell SS
Carlile SH
7250
SS: (100%) lt - med brn, com drk gry, vf-f grn, md-sbrnd, mod-pr srtd, pr mod-gd sphcty, occ glauc grns, cly/calc cmt, sl rxn w/ HCL, no vis stn, fr cldy cuts, occ fst bri gmsh blu strmg cut, gd bri pale gm res mg
SS: (100%) lt - med brn, com drk gry, vf-f grn, md-sbrnd, mod-pr srtd, pr mod-gd sphcty, occ glauc grns, cly/calc cmt, sl rxn w/ HCL, no vis stn, fst bri gmsh blu strmg cut, gd bri pale gm res mg
7300
500
500
500
500
Total (units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)
0
0
0
0
MW/MWO 10.0 VIS 52


1000
500
250
50
ML ROP (ft/hr)
Total gas (units)
MWD_GR (API)
ML WOB (k-lbs)
0
0
0
Last Reading MWD GR
15100
15150
15200
15250
MD 15105 TVD 7236.28
INC 90.37 AZ 269.49
VS 8151.91
MD 15194 TVD 7235.56
INC 90.56 AZ 268.73
VS 8240
MD 15218 TVD 7235.32
INC 90.56 AZ 268.73
VS 8263.74
5 1/2" Production Casing Set at 15
Reached DMTD of 15,218' MD @17:32 hrs.
on 4/22/2018
Formation tops picked by Br
Larry Goolsby, GBA.
PTB
MD
Sharon Springs 7047'
"A" Chalk 7081'
"A" Chalk Base 7106'
"B" Upper Marl 7236'
"B" Chalk 7260'
"B" Marl 7297'
"C" Chalk 7353'
"C" Marl 7417'
K Marker 7465'
Ft. Hays 7574'
Codell 7669'
Target Heel 7765'
DMTD 15218'
7250
7300
SS: (100%) lt - med brn, com drk gry, vf-f gm,
md-sbrnd, mod-pr srtd, pr mod-gd sphcty,
occ glauc gms, calc cmt, sl rxn w/ HCL, no
vis stn, gd cldy cuts, occ fst bri gmsh blu
strmg cut, gd bri pale gm res mg
THANK YOU FOR USING
GOOLSBY BROTHERS
& ASSOCIATES
Brian Spitzmiller & Larry Gools
500
500
500
500
C1 (units)
C2 (units)
C3 (units)
C4 (units)
0
0
0
MW/MWO 10.0 VIS 53

15

5,205' MD

rian Spitzmiller and

TVD	SSD
6928'	-2106'
6960'	-2138'
6978'	-2156'
7074'	-2252'
7092'	-2270'
7118'	-2296'
7150'	-2328'
7182'	-2360'
7204'	-2382'
7238'	-2416'
7260'	-2438'
7270'	-2448'
7235'	-2413'

sby