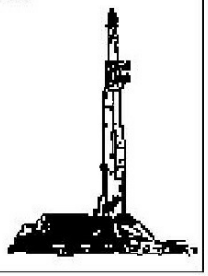
GOOLSBY BROTHERS
and associates, inc.
575 Union Blvd, Suite 208
Lakewood, CO 80228
303-945-2860 Office
Geological Wellsite
Supervision
www.goolsbybrothers.com



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

Well Name:	**Greenleaf 37C-15HZ**
API:	**05123379220000**
Location:	**Section 15, T2N, R65W**
License Number:	
Region:	**DJ Basin**
Spud Date:	**December 14, 2014**
Drilling Completed:	**December 19, 2014**
Surface Coordinates:	**NENE Sec 15 T2N R65W; 460' FNL, 1255' FEL**
	LAT: 40.159141; LONG: -104.700563
Bottom Hole Coordinates:	**BHL: SESE Sec 35 T2N R65W; 279' FSL; 585' FEL**
Ground Elevation (ft):	**4,868'**
K.B. Elevation (ft):	**4,884'**
Logged Interval (ft):	**6800'** **To: 11814'**
Total Depth (ft):	**11814' DMTD**
Formation:	**Pierre Shales/Sands, Sharon Springs, Niobrara, Codell (Target)**
Type of Drilling Fluid:	**Water & Poly to 5000', LSND 5000'-11814'**

OPERATOR

Company: **Kerr-McGee Oil & Gas Onshore LP**
Address: **Granite Tower - 1099 18th St, Ste 1800**
Denver, CO 80202
CO Geologist, Tom Birmingham

GEOLOGIST

Name: **Shelton Davis & Larry Goolsby**
Company: **Goolsby Brothers & Assoc. (GBA), Inc. (www.goolsbybrothers.com)**
Address: **575 Union Blvd.**
Suite 208,
Lakewood CO. 80228

E-logs

MWD GR 6650' - 11767'

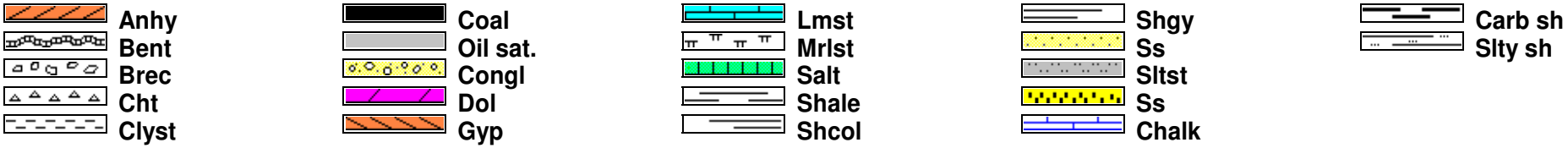
Casing

9 5/8" Surface Casing set @ 825' MD
7" Intermediate Casing set @ 7626' MD
4 1/2" Production Liner hung 12/XX/2014, landed @ XXXXX' MD

Comments

1) Drilling Contractor: Xtreme Drilling, Rig # 23
2) Directional Drilling: Baker Hughes
   MWD GR: Baker Hughes
3) Gas Equipment: Pason Gas Analyzer and Agitator

ROCK TYPES



ACCESSORIES

OTHER SYMBOLS

OIL SHOWS

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

POROSITY TYPE

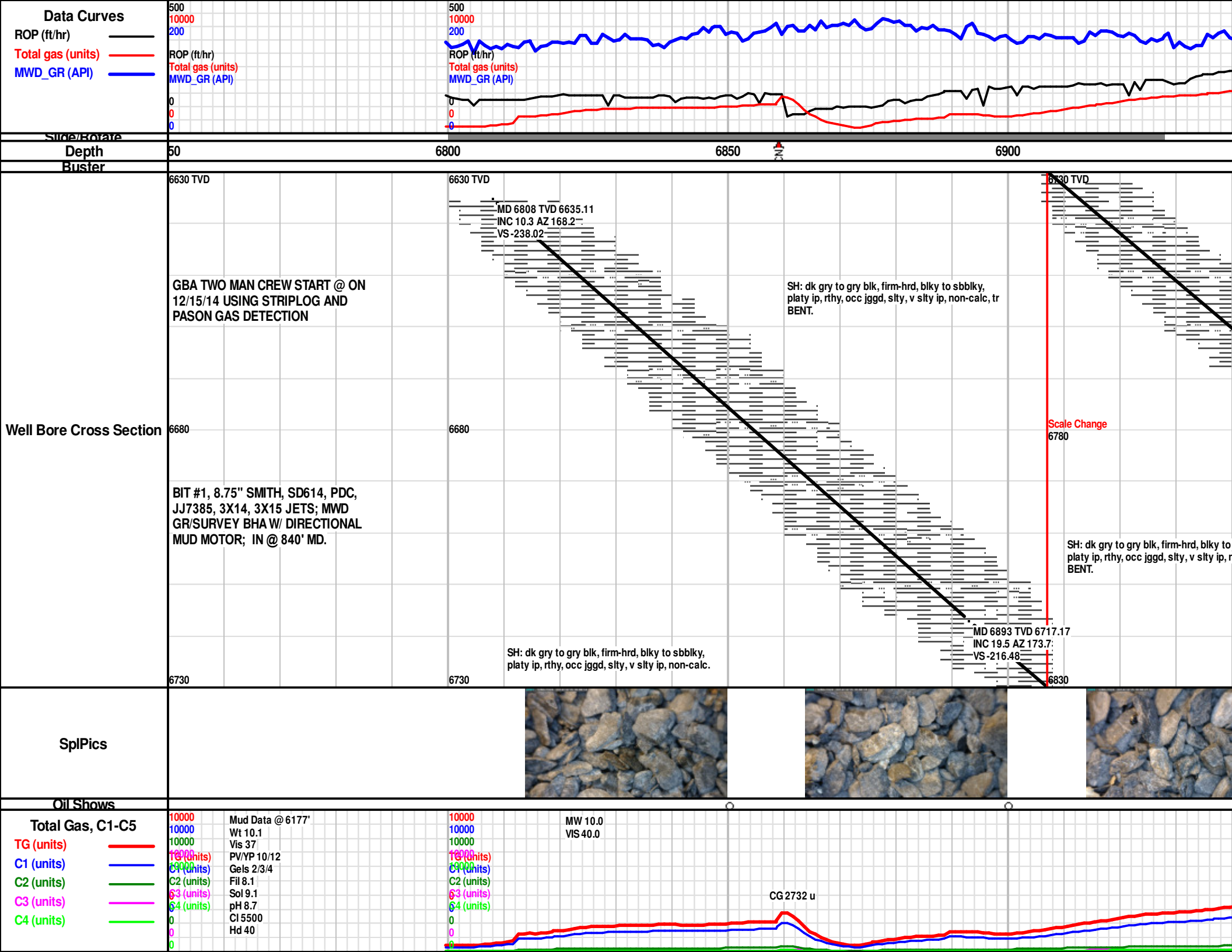
- E Earthy
- Fenest
- F Fracture
- Inter
- Moldic
- O Organic
- P Pinpoint
- V Vuggy

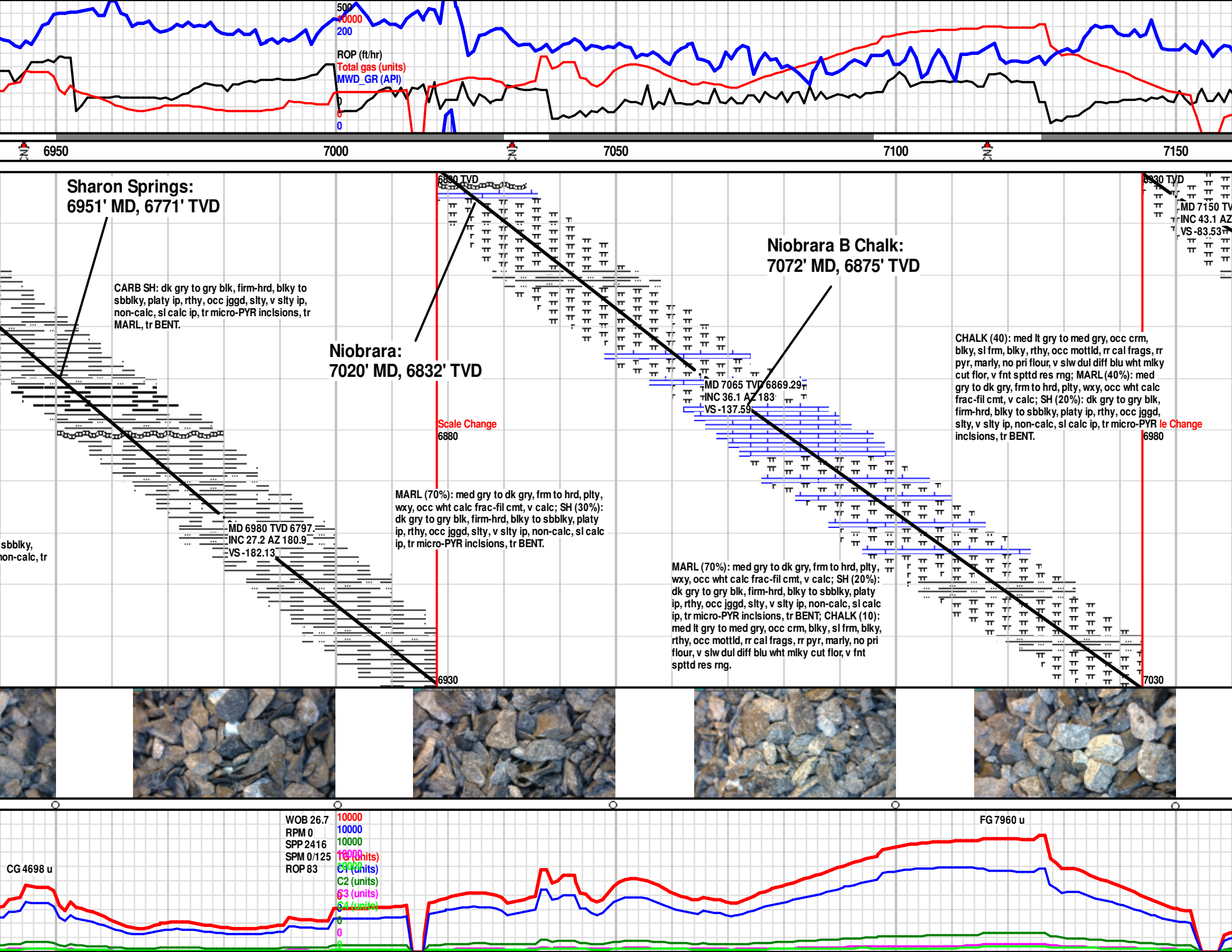
ROUNDING

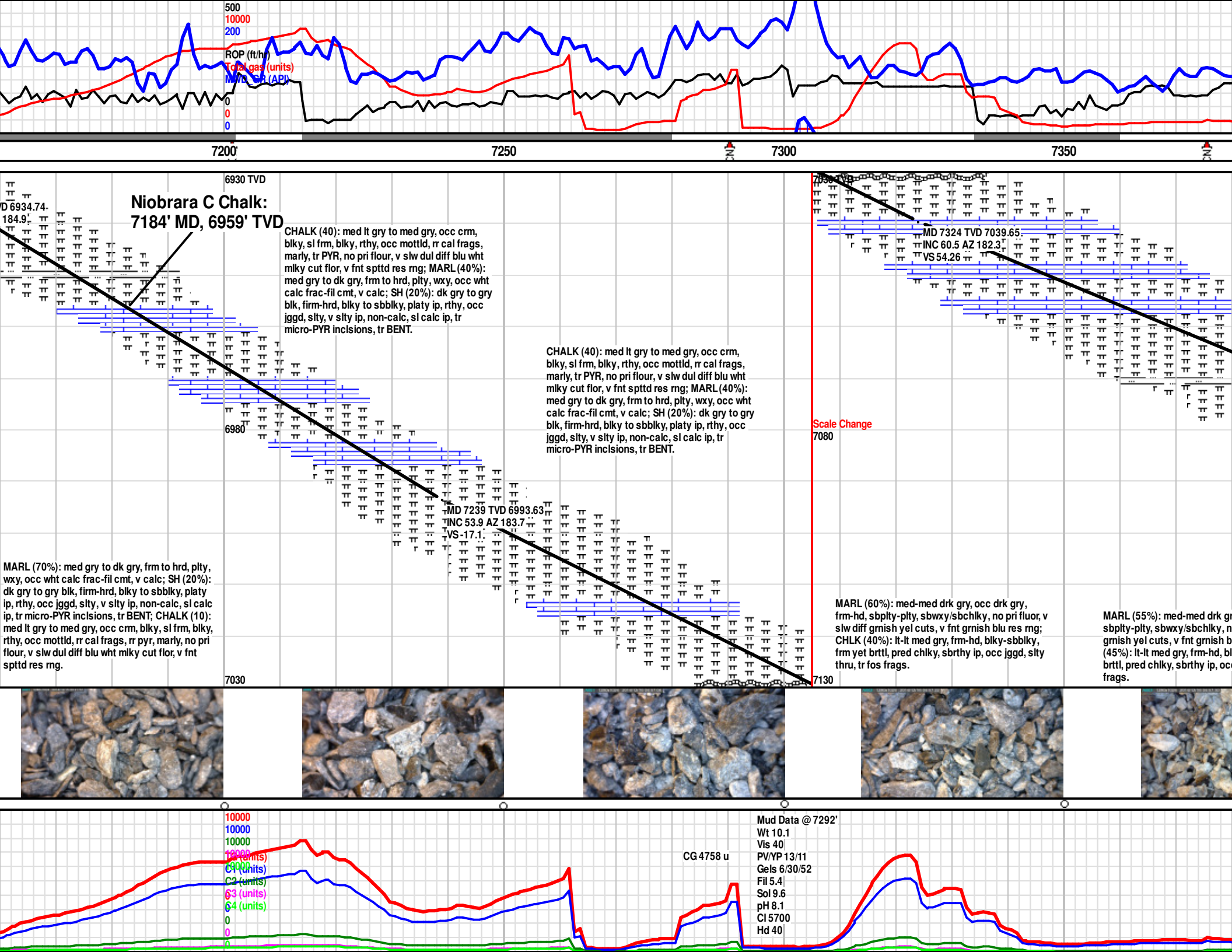
- R Rounded
- r Subrnd
- a Subang
- A Angular

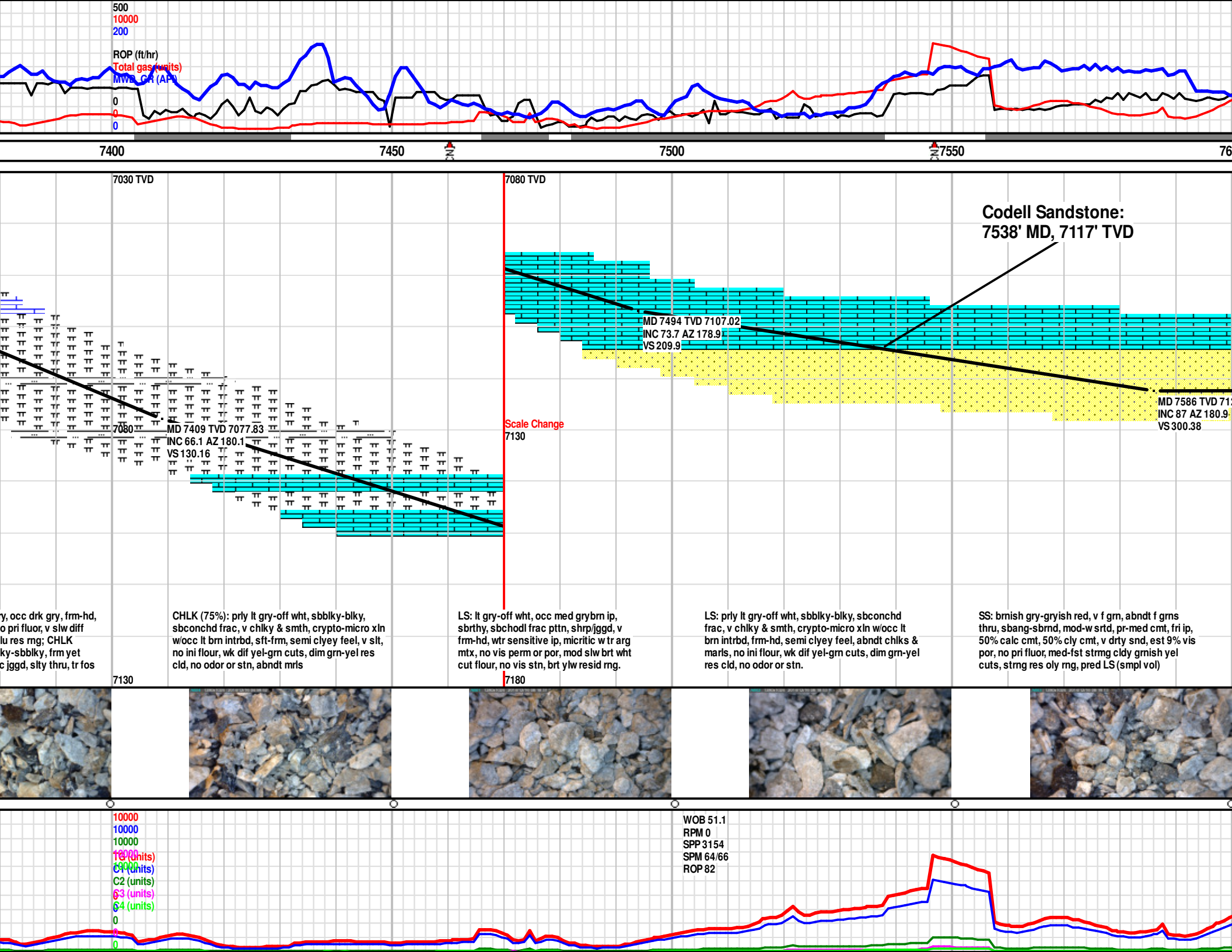
SORTING

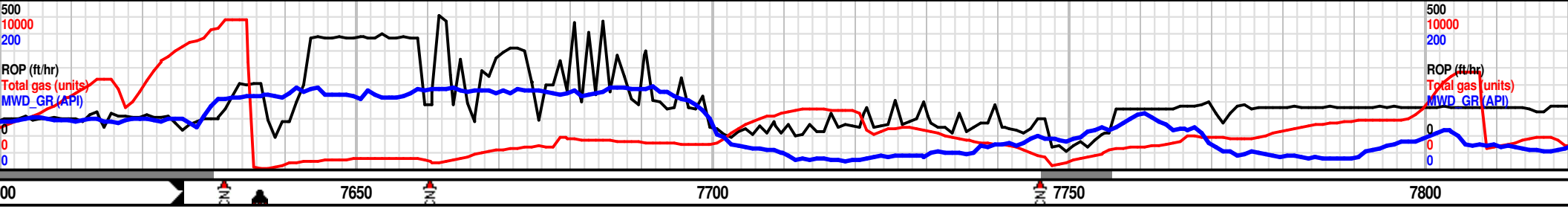
- W Well
- M Moderate
- P Poor


Data Curves
ROP (ft/hr)
Total gas (units)
MWD_GR (API)
500
10000
200
ROP (ft/hr)
Total gas (units)
MWD_GR (API)
0
0
0
Slide/Rotate
Depth
50
6800
6850
6900
Buster
Well Bore Cross Section
6630 TVD
MD 6808 TVD 6635.11
INC 10.3 AZ 168.2
VS -238.02
GBA TWO MAN CREW START @ ON 12/15/14 USING STRIPLOG AND PASON GAS DETECTION
SH: dk gry to gry blk, firm-hrd, blky to sbblky, platy ip, rthy, occ jggd, slty, v slty ip, non-calc, tr BENT.
Scale Change
6780
6680
BIT #1, 8.75" SMITH, SD614, PDC, JJ7385, 3X14, 3X15 JETS; MWD GR/SURVEY BHA W/ DIRECTIONAL MUD MOTOR; IN @ 840' MD.
MD 6893 TVD 6717.17
INC 19.5 AZ 173.7
VS -216.48
SH: dk gry to gry blk, firm-hrd, blky to sbblky, platy ip, rthy, occ jggd, slty, v slty ip, non-calc.
6730
6830
SplPics
Oil Shows
Total Gas, C1-C5
TG (units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)
Mud Data @ 6177'
Wt 10.1
Vis 37
PV/YP 10/12
Gels 2/3/4
Fil 8.1
Sol 9.1
pH 8.7
Cl 5500
Hd 40
MW 10.0
VIS 40.0
CG 2732 u


500
10000
200
ROP (ft/hr)
Total gas (units)
MWD_GR (API)
0
0
0
6950
7000
7050
7100
7150
Sharon Springs:
6951' MD, 6771' TVD
CARB SH: dk gry to gry blk, firm-hrd, blky to sbblky, platy ip, rthy, occ jggd, slty, v slty ip, non-calc, sl calc ip, tr micro-PYR inclsions, tr MARL, tr BENT.
Niobrara:
7020' MD, 6832' TVD
Niobrara B Chalk:
7072' MD, 6875' TVD
6880 TVD
Scale Change
6880
MD 6980 TVD 6797.
INC 27.2 AZ 180.9
VS -182.13
MARL (70%): med gry to dk gry, frm to hrd, plty, wxy, occ wht calc frac-fil cmt, v calc; SH (30%): dk gry to gry blk, firm-hrd, blky to sbblky, platy ip, rthy, occ jggd, slty, v slty ip, non-calc, sl calc ip, tr micro-PYR inclsions, tr BENT.
6930
MD 7065 TVD 6869.29
INC 36.1 AZ 183
VS -137.59
MARL (70%): med gry to dk gry, frm to hrd, plty, wxy, occ wht calc frac-fil cmt, v calc; SH (20%): dk gry to gry blk, firm-hrd, blky to sbblky, platy ip, rthy, occ jggd, slty, v slty ip, non-calc, sl calc ip, tr micro-PYR inclsions, tr BENT; CHALK (10): med lt gry to med gry, occ crm, blky, sl frm, blky, rthy, occ mottld, rr cal frags, rr pyr, marly, no pri flour, v slw dul diff blu wht mlky cut flor, v fnt spttd res rng.
6930 TVD
MD 7150 TV
INC 43.1 AZ
VS -83.53
CHALK (40): med lt gry to med gry, occ crm, blky, sl frm, blky, rthy, occ mottld, rr cal frags, rr pyr, marly, no pri flour, v slw dul diff blu wht mlky cut flor, v fnt spttd res rng; MARL (40%): med gry to dk gry, frm to hrd, plty, wxy, occ wht calc frac-fil cmt, v calc; SH (20%): dk gry to gry blk, firm-hrd, blky to sbblky, platy ip, rthy, occ jggd, slty, v slty ip, non-calc, sl calc ip, tr micro-PYR le Change
inclsions, tr BENT.
6980
7030
sbblky,
non-calc, tr
WOB 26.7
RPM 0
SPP 2416
SPM 0/125
ROP 83
10000
10000
10000
10000
10000
TG (units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)
0
0
0
CG 4698 u
FG 7960 u


500
10000
200
ROP (ft/hr)
Total gas (units)
MWD_GR (API)
0
0
0
7200
7250
7300
7350
6930 TVD
Niobrara C Chalk:
7184' MD, 6959' TVD
CHALK (40): med lt gry to med gry, occ crm, blky, sl frm, blky, rthy, occ mottld, rr cal frags, marly, tr PYR, no pri flour, v slw dul diff blu wht mlky cut flor, v fnt spttd res rng; MARL (40%): med gry to dk gry, frm to hrd, plty, wxy, occ wht calc frac-fil cmt, v calc; SH (20%): dk gry to gry blk, firm-hrd, blky to sbblky, platy ip, rthy, occ jggd, slty, v slty ip, non-calc, sl calc ip, tr micro-PYR inclsions, tr BENT.
CHALK (40): med lt gry to med gry, occ crm, blky, sl frm, blky, rthy, occ mottld, rr cal frags, marly, tr PYR, no pri flour, v slw dul diff blu wht mlky cut flor, v fnt spttd res rng; MARL (40%): med gry to dk gry, frm to hrd, plty, wxy, occ wht calc frac-fil cmt, v calc; SH (20%): dk gry to gry blk, firm-hrd, blky to sbblky, platy ip, rthy, occ jggd, slty, v slty ip, non-calc, sl calc ip, tr micro-PYR inclsions, tr BENT.
MD 7324 TVD 7039.65
INC 60.5 AZ 182.3
VS 54.26
MD 7239 TVD 6993.63
INC 53.9 AZ 183.7
VS -17.1
Scale Change
6980
7080
7030
7130
MARL (70%): med gry to dk gry, frm to hrd, plty, wxy, occ wht calc frac-fil cmt, v calc; SH (20%): dk gry to gry blk, firm-hrd, blky to sbblky, platy ip, rthy, occ jggd, slty, v slty ip, non-calc, sl calc ip, tr micro-PYR inclsions, tr BENT; CHALK (10): med lt gry to med gry, occ crm, blky, sl frm, blky, rthy, occ mottld, rr cal frags, rr pyr, marly, no pri flour, v slw dul diff blu wht mlky cut flor, v fnt spttd res rng.
MARL (60%): med-med drk gry, occ drk gry, frm-hd, sbplty-plty, sbwxy/sbchlky, no pri fluor, v slw diff grnish yel cuts, v fnt grnish blu res rng; CHLK (40%): lt-lt med gry, frm-hd, blky-sbblky, frm yet brttl, pred chlky, sbrthy ip, occ jggd, slty thru, tr fos frags.
MARL (55%): med-med drk gr
sbplty-plty, sbwxy/sbchlky, n
grnish yel cuts, v fnt grnish b
(45%): lt-lt med gry, frm-hd, bl
brttl, pred chlky, sbrthy ip, oc
frags.
10000
10000
10000
C1 (units)
C2 (units)
C3 (units)
C4 (units)
0
0
0
CG 4758 u
Mud Data @ 7292'
Wt 10.1
Vis 40
PV/YP 13/11
Gels 6/30/52
Fil 5.4
Sol 9.6
pH 8.1
Cl 5700
Hd 40


500
10000
200
ROP (ft/hr)
Total gas (units)
MWD GR (API)
0
0
0
7400
7450
7500
7550
7030 TVD
7080 TVD
Codell Sandstone:
7538' MD, 7117' TVD
MD 7494 TVD 7107.02
INC 73.7 AZ 178.9
VS 209.9
MD 7586 TVD 71
INC 87 AZ 180.9
VS 300.38
7080
MD 7409 TVD 7077.83
INC 66.1 AZ 180.1
VS 130.16
Scale Change
7130
y, occ drk gry, frm-hd,
o pri fluor, v slw diff
lu res rng; CHLK
ky-sbblky, frm yet
c jggd, slty thru, tr fos
CHLK (75%): prly lt gry-off wht, sbblky-blky, sbconchd frac, v chlky & smth, crypto-micro xln w/occ lt brn intrbd, sft-frm, semi clyey feel, v slt, no ini flour, wk dif yel-grn cuts, dim grn-yel res cld, no odor or stn, abndt mrls
LS: lt gry-off wht, occ med grybrn ip, sbrthy, sbchodl frac pttn, shrp/jggd, v frm-hd, wtr sensitive ip, micritic w tr arg mtx, no vis perm or por, mod slw brt wht cut flour, no vis stn, brt ylw resid rng.
LS: prly lt gry-off wht, sbblky-blky, sbconchd frac, v chlky & smth, crypto-micro xln w/occ lt brn intrbd, frm-hd, semi clyey feel, abndt chlks & marls, no ini flour, wk dif yel-grn cuts, dim grn-yel res cld, no odor or stn.
SS: brnish gry-gryish red, v f grn, abndt f grns thru, sbang-sbrnd, mod-w srtd, pr-med cmt, fri ip, 50% calc cmt, 50% cly cmt, v drty snd, est 9% vis por, no pri fluor, med-fst strmg cldy grnish yel cuts, strng res oly rng, pred LS (smpl vol)
7130
7180
10000
10000
10000
10000
C1 (units)
C2 (units)
C3 (units)
C4 (units)
0
0
0
WOB 51.1
RPM 0
SPP 3154
SPM 64/66
ROP 82



7080 TVD

Reached ICPL @ 7636' 06:15 12/16/2014. Short trip above KOP, pmp hgh vis swps, condition hole, TO DP, PU & run 7"csg to 7626' MD, PU new Bit, NB #2, 6 1/8", SEC, MM54, 5X16, In @ 7636'. OB #1, Drld 6791' in 25 hrs, ave ROP 272 ft/hr.

MD 7694 TVD 7 22.22
INC 93.2 AZ 181.8
VS 408.32

MD 7780 TVD 7117.95
INC 92.5 AZ 181.7
VS 494.2

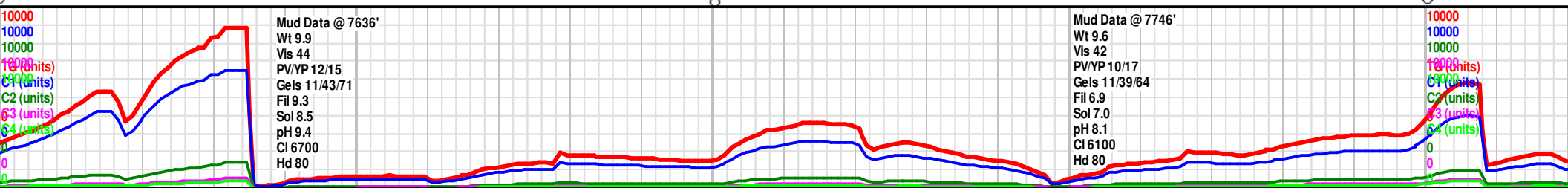
22.41

7130

7180

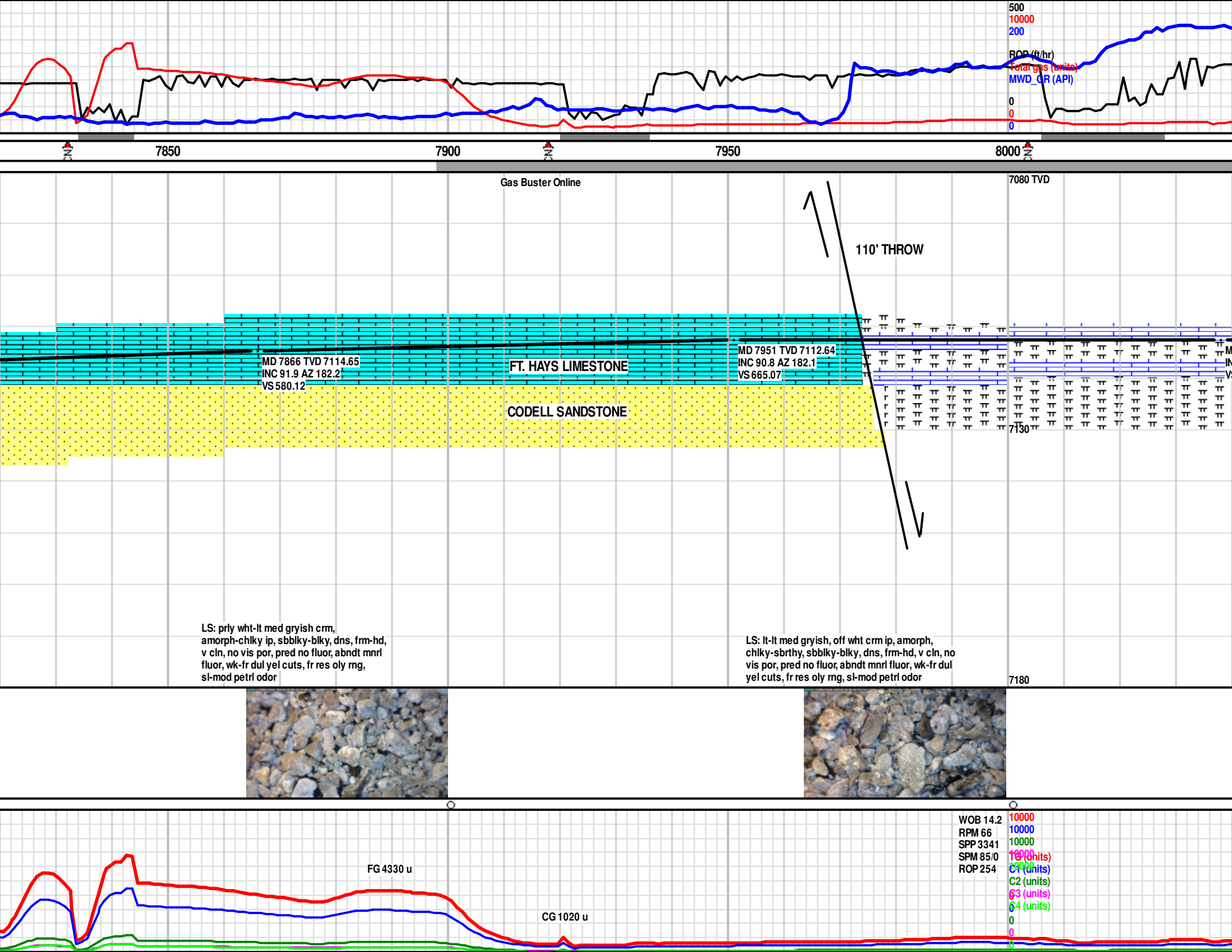
SS: lt-lt med gryish brn, L/U v f grn, rnd-sbrnd, mod-w srtd, wk-fr cmt, pred con, non-v sl calc, drty snd w abndt sft lith incls, 10% est vis por, no vis stn, dim spty pri fluor, wk slw dif cldy yel cuts, fr yelish grn res cld, v fnt gsy odor, abndt LS & SH in smpl, 80+% tot smpl vol

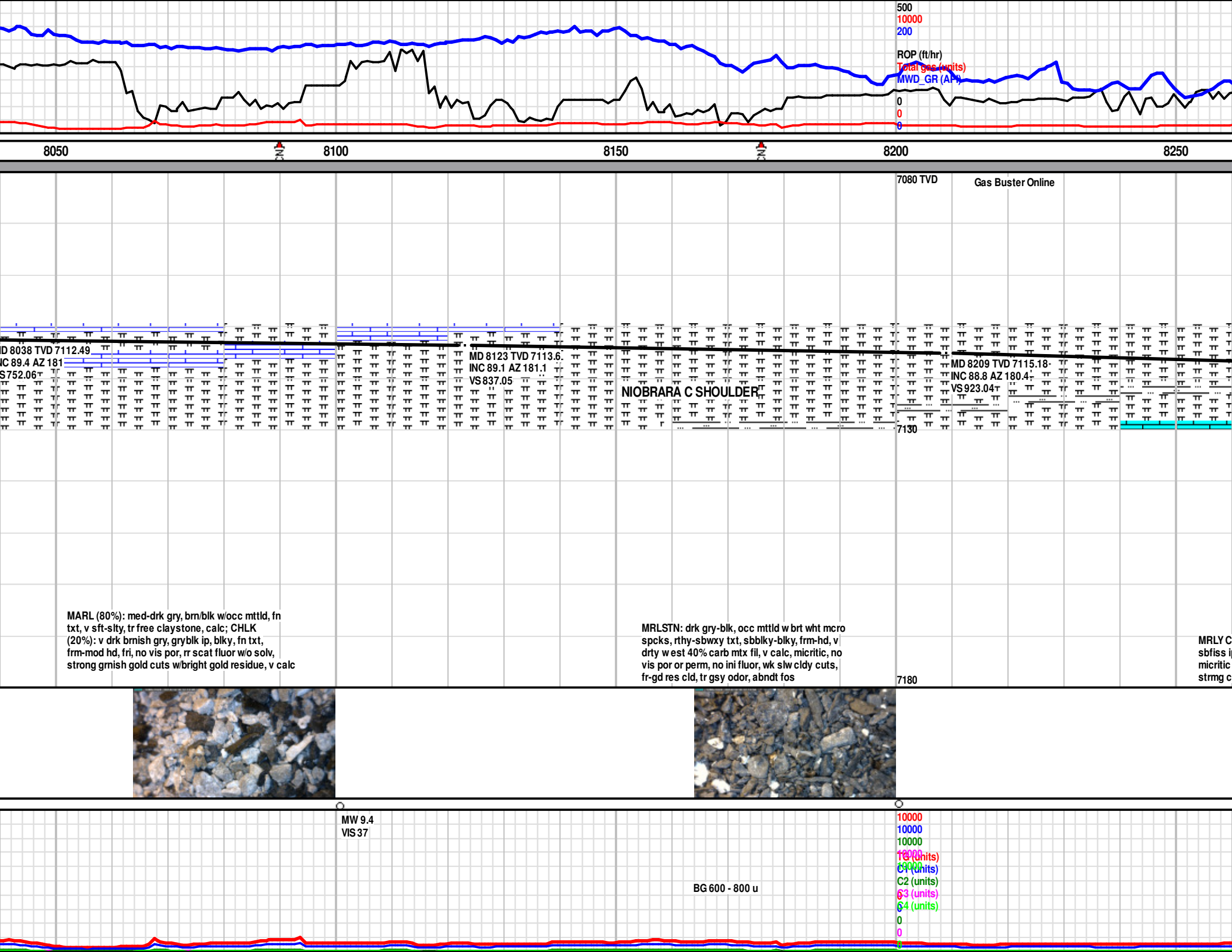
LS: lt gry-off wht, lt gry brn ip, sbblky-blky, bldd & shrp ip, frm-hd, semi cln, no vis por, gd near even mnrl fluor, no cut or show, abndt bit chttr

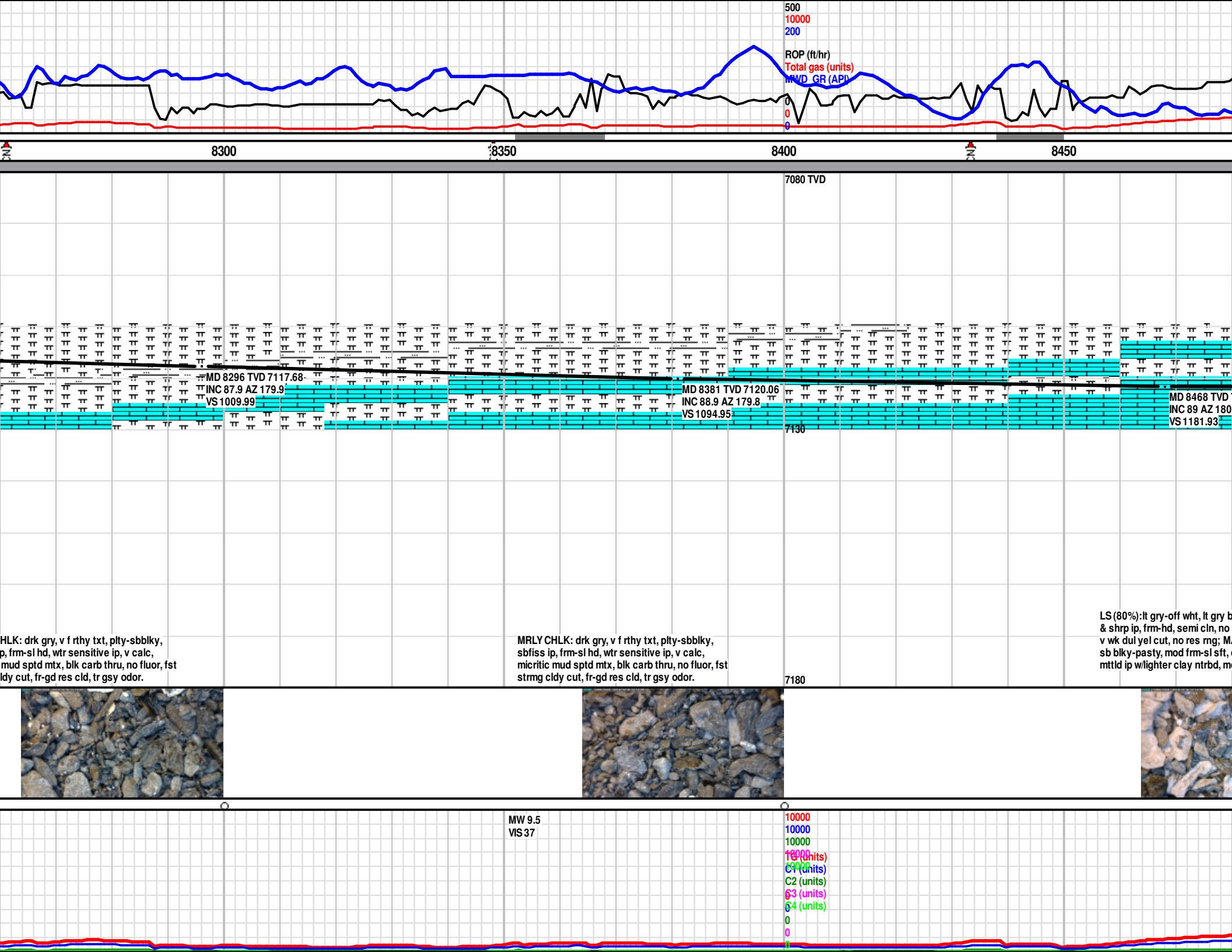


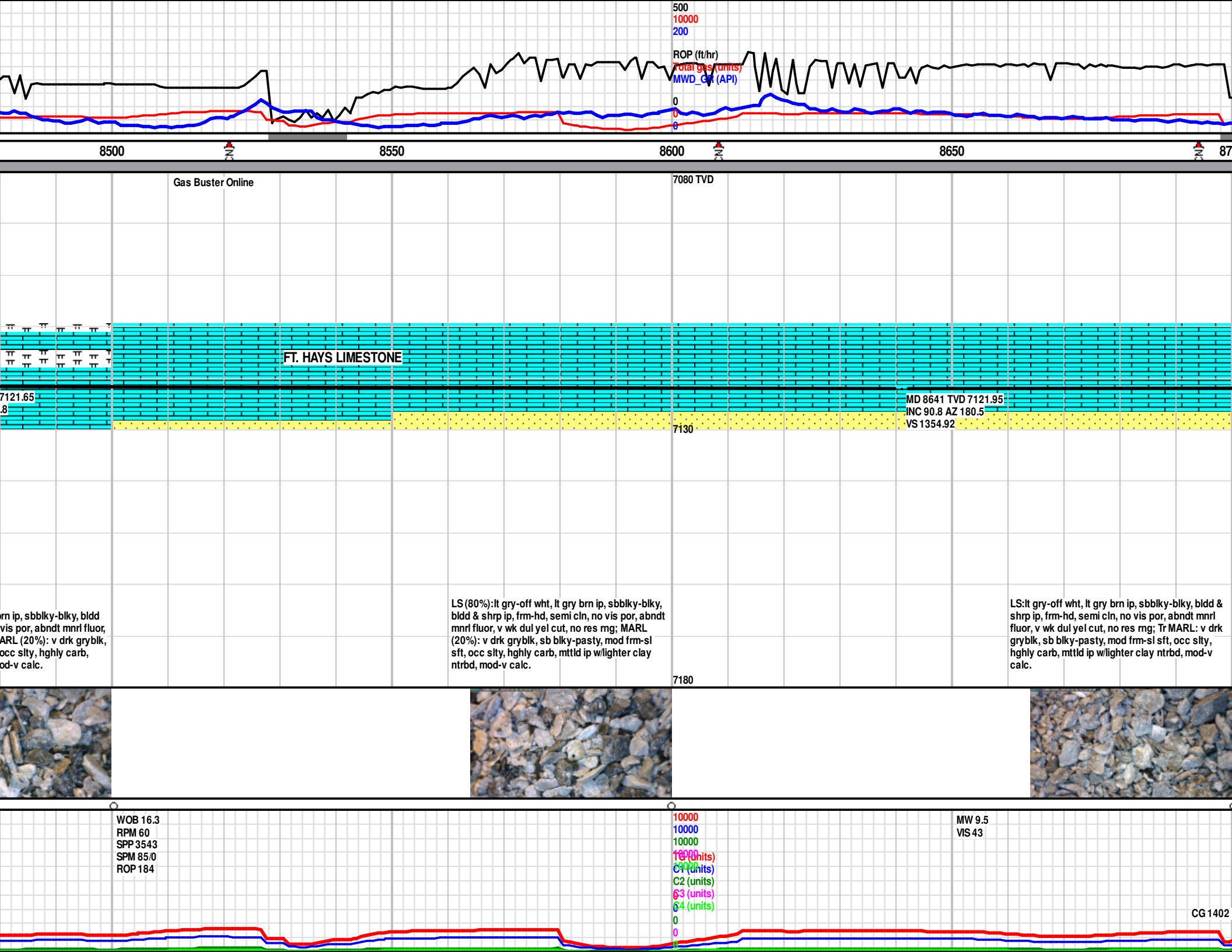
Mud Data @ 7636'
Wt 9.9
Vis 44
PV/YP 12/15
Gels 11/43/71
Fil 9.3
Sol 8.5
pH 9.4
Cl 6700
Hd 80

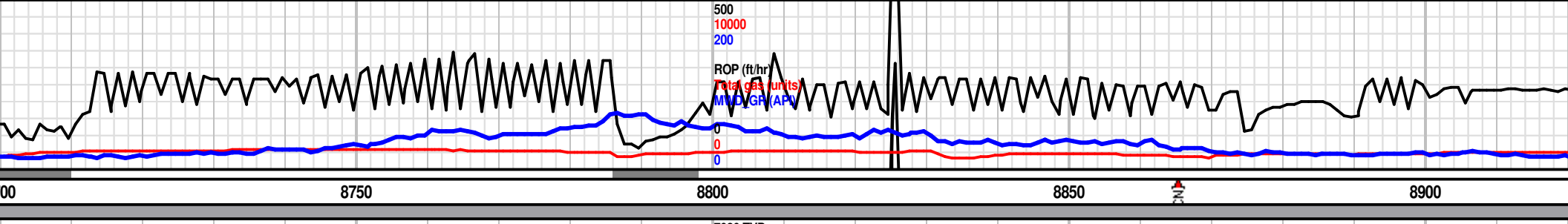
Mud Data @ 7746'
Wt 9.6
Vis 42
PV/YP 10/17
Gels 11/39/64
Fil 6.9
Sol 7.0
pH 8.1
Cl 6100
Hd 80


500
10000
200
ROP (ft/hr)
Total gas (units)
MWD_GR (API)
0
0
0
7850
7900
7950
8000
Gas Buster Online
7080 TVD
110' THROW
MD 7866 TVD 7114.65
INC 91.9 AZ 182.2
VS 580.12
FT. HAYS LIMESTONE
MD 7951 TVD 7112.64
INC 90.8 AZ 182.1
VS 665.07
CODELL SANDSTONE
7130
LS: prly wht-lt med gryish crm, amorph-chlky ip, sbblky-blky, dns, frm-hd, v cln, no vis por, pred no fluor, abndt mnrl fluor, wk-fr dul yel cuts, fr res oly rng, sl-mod petrl odor
LS: lt-lt med gryish, off wht crm ip, amorph, chlky-sbrthy, sbblky-blky, dns, frm-hd, v cln, no vis por, pred no fluor, abndt mnrl fluor, wk-fr dul yel cuts, fr res oly rng, sl-mod petrl odor
7180
WOB 14.2
RPM 66
SPP 3341
SPM 85/0
ROP 254
10000
10000
10000
10000
1000
0
0
0
Tg (units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)
FG 4330 u
CG 1020 u


500
10000
200
ROP (ft/hr)
Total gas (units)
MWD_GR (API)
0
0
0
8050
8100
8150
8200
8250
7080 TVD
Gas Buster Online
ID 8038 TVD 7112.49
NC 89.4 AZ 181
S 752.06
MD 8123 TVD 7113.6
INC 89.1 AZ 181.1
VS 837.05
NIOBRARA C SHOULDER
MD 8209 TVD 7115.18
INC 88.8 AZ 180.4
VS 923.04
7130
MARL (80%): med-drk gry, brn/blk w/occ mttld, fn txt, v sft-slty, tr free claystone, calc; CHLK (20%): v drk brnish gry, grybik ip, blky, fn txt, frm-mod hd, fri, no vis por, rr scat fluor w/o solv, strong grnish gold cuts w/bright gold residue, v calc
MRLSTN: drk gry-blk, occ mttld w brt wht mcro spcks, rthy-sbwxy txt, sbblky-blky, frm-hd, v drty w est 40% carb mtx fil, v calc, micritic, no vis por or perm, no ini fluor, wk slw cldy cuts, fr-gd res cld, tr gsy odor, abndt fos
MRLY C
sbfiss i
micritic
strmg c
7180
MW 9.4
VIS 37
BG 600 - 800 u
10000
10000
10000
10000
C1 (units)
C2 (units)
C3 (units)
C4 (units)
0
0
0


500
10000
200
ROP (ft/hr)
Total gas (units)
MWD_GR (API)
0
0
0
8300
8350
8400
8450
7080 TVD
MD 8296 TVD 7117.68
INC 87.9 AZ 179.9
VS 1009.99
MD 8381 TVD 7120.06
INC 88.9 AZ 179.8
VS 1094.95
MD 8468 TVD
INC 89 AZ 180
VS 1181.93
7130
HLK: drk gry, v f rthy txt, plty-sbblky,
p, frm-sl hd, wtr sensitive ip, v calc,
mud sptd mtx, blk carb thru, no fluor, fst
ldy cut, fr-gd res cld, tr gsy odor.
MRLY CHLK: drk gry, v f rthy txt, plty-sbblky,
sbfiss ip, frm-sl hd, wtr sensitive ip, v calc,
micritic mud sptd mtx, blk carb thru, no fluor, fst
strmg cldy cut, fr-gd res cld, tr gsy odor.
LS (80%):lt gry-off wht, lt gry b
& shrp ip, frm-hd, semi cln, no
v wk dul yel cut, no res rng; M
sb blky-pasty, mod frm-sl sft,
mttld ip w/lighter clay ntrbd, m
7180
MW 9.5
VIS 37
10000
10000
10000
C1 (units)
C2 (units)
C3 (units)
C4 (units)
0
0
0


500
10000
200
ROP (ft/hr)
Total gas (units)
MWD_GR (API)
0
0
0
8500
8550
8600
8650
87
Gas Buster Online
7080 TVD
FT. HAYS LIMESTONE
7121.65
.8
MD 8641 TVD 7121.95
INC 90.8 AZ 180.5
VS 1354.92
7130
rn ip, sbblky-blky, bldd
vis por, abndt mnrl fluor,
ARL (20%): v drk gryblk,
occ slty, hghly carb,
od-v calc.
LS (80%):lt gry-off wht, lt gry brn ip, sbblky-blky, bldd & shrp ip, frm-hd, semi cln, no vis por, abndt mnrl fluor, v wk dul yel cut, no res rng; MARL (20%): v drk gryblk, sb blky-pasty, mod frm-sl sft, occ slty, hghly carb, mttld ip w/lighter clay ntrbd, mod-v calc.
LS:lt gry-off wht, lt gry brn ip, sbblky-blky, bldd & shrp ip, frm-hd, semi cln, no vis por, abndt mnrl fluor, v wk dul yel cut, no res rng; Tr MARL: v drk gryblk, sb blky-pasty, mod frm-sl sft, occ slty, hghly carb, mttld ip w/lighter clay ntrbd, mod-v calc.
7180
WOB 16.3
RPM 60
SPP 3543
SPM 85/0
ROP 184
10000
10000
10000
10000
10000
C1 (units)
C2 (units)
C3 (units)
C4 (units)
0
0
0
MW 9.5
VIS 43
CG 1402



7080 TVD

Gas Buster Online

FT. HAYS LIMESTONE

CODELL SANDSTONE

MD 8812 TVD 7121.8
INC 89.3 AZ 181.3
VS 1525.91

7130

LS:lt gry-off wht, lt gry brn ip, sbblky-blky, bldd & shrp ip, frm-hd, semi cln, no vis por, abndt mnrl fluor, v wk dul yel cut, no res rng; Tr MARL: v drk gryblk, sb blky-pasty, mod frm-sl sft, occ slty, hghly carb, mttld ip w/lighter clay ntrbd, mod-v calc.

7180

MW 9.5
VIS 39

10000
10000
10000
10000
10000
TG (units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)
0
0
0

BG 700 - 900 u

u

500
10000
200
ROP (ft/hr)
Total gas (units)
MWD_GR (API)
0
0
0

8950 | 9000 | 9050 | 9100

7080 TVD

Gas Buster Online

MD 8985 TVD 7123.92
INC 89.3 AZ 181.6
VS 1698.89

7130

MD 9070 TVD 7125.55
INC 88.5 AZ 181.2
VS 1783.87

LS:lt gry-off wht, lt gry brn ip, sbblky-blky, bldd & shrp ip, frm-hd, semi cln, no vis por, abndt mnrl fluor, v wk dul yel cut, no res rng; Tr MARL: v drk gryblk, sb blky-pasty, mod frm-sl sft, occ slty, hghly carb, mttld ip w/lighter clay ntrbd, mod-v calc.

LS: lt gry-off wht, lt gry brn ip, sbblky-blky, bldd & shrp ip, frm-hd, semi cln, no vis por, abndt mnrl fluor, v wk dul yel cut, no res rng; Tr SS: lt-lt med gryish brn, L/U v f grn, rnd-sbrnd, mod-w srtd, wk-fr cmt, no dir flour, no cut flour.

7180

MW 9.5
VIS 39

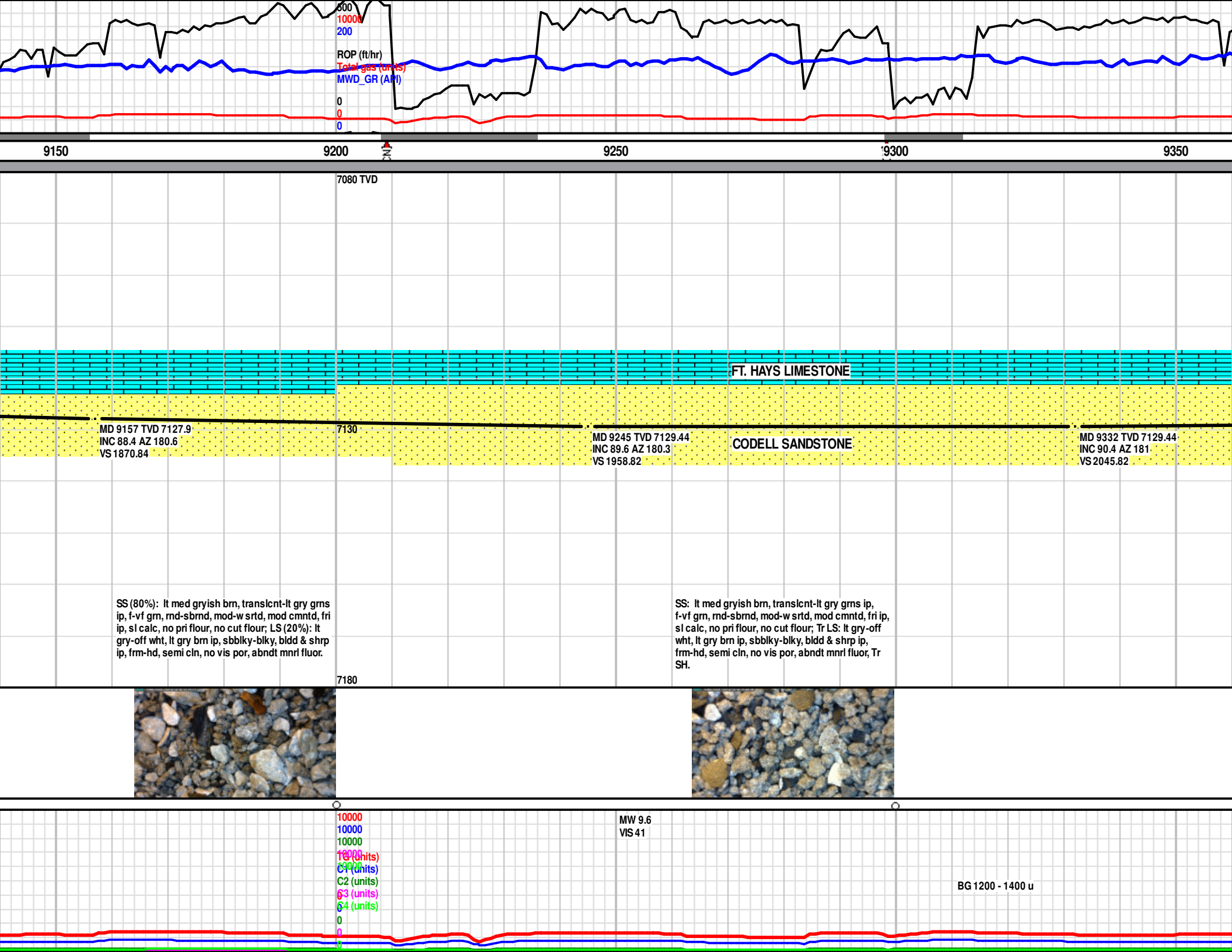
WOB 10.5
RPM 55
SPP 3722
SPM 87/0
ROP 220

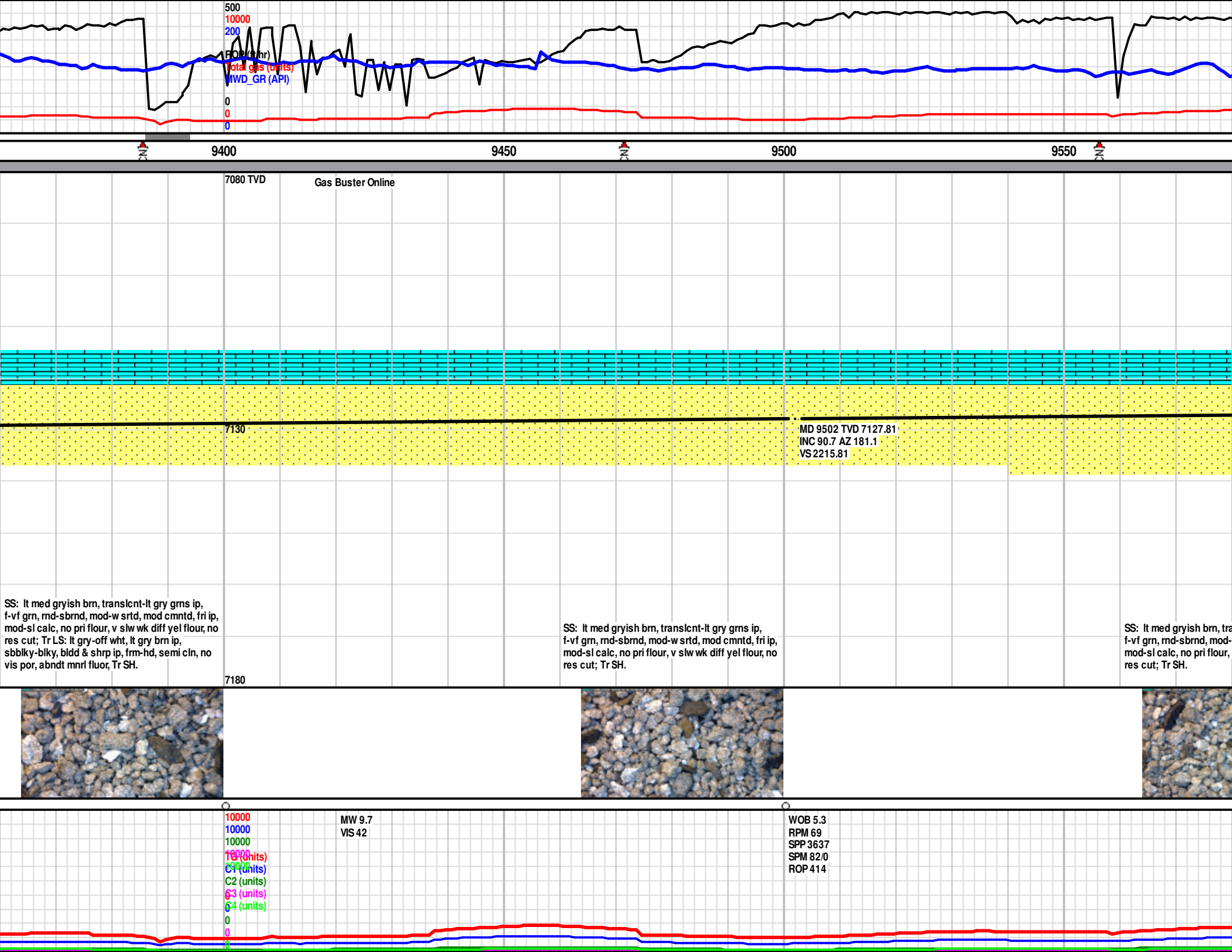
10000
10000
10000
10000
10000
C1 (units)
C2 (units)
C3 (units)
C4 (units)
0
0
0

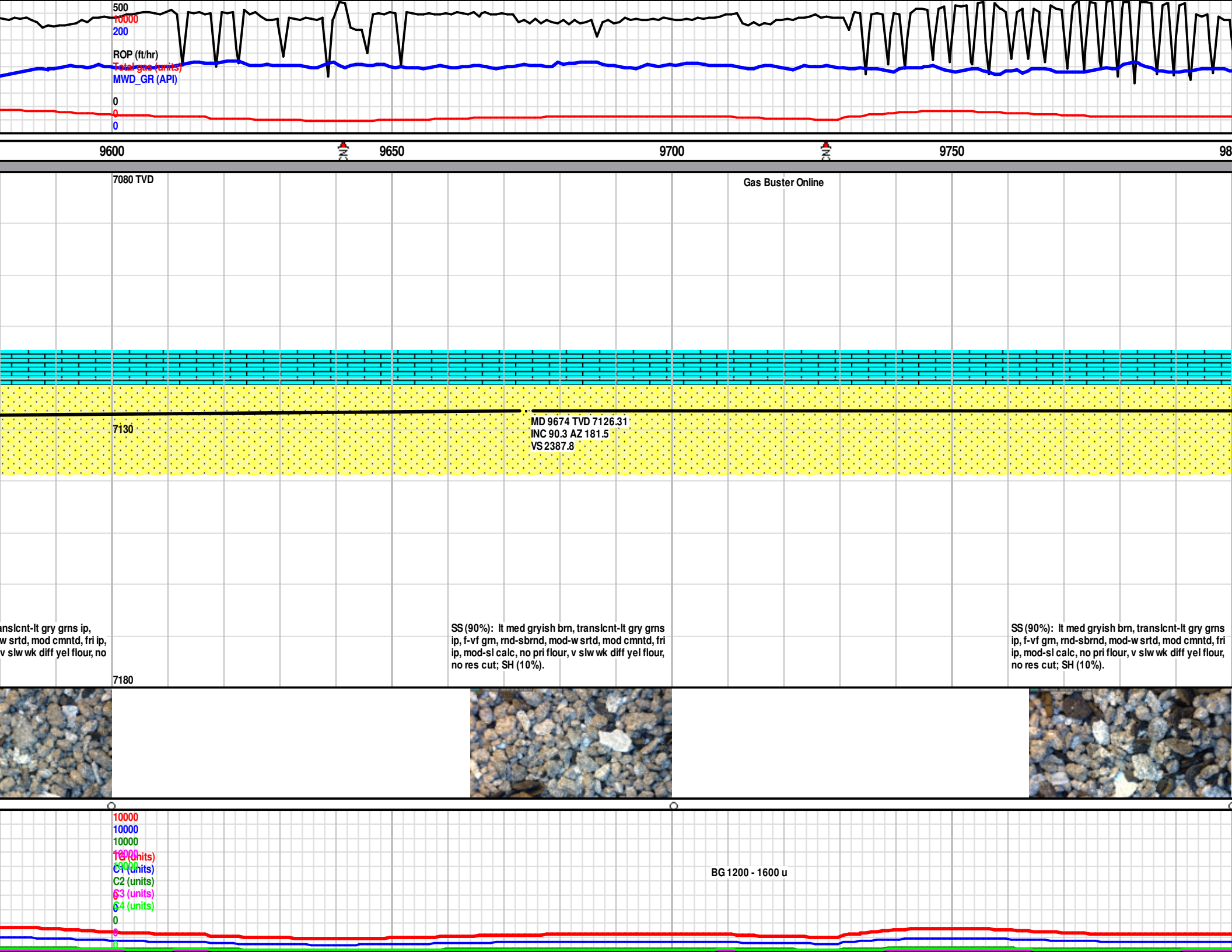
CG 1161 u

Mud Data @ 9041'
Wt 9.8
Vis 39
PV/YP 13/10
Gels 3/10/15
Fil 5.8
Sol 8.1
pH 9.9
Cl 5800
Hd 40

MW 9.5+
VIS 41


500
10000
200
ROP (ft/hr)
Total gas (units)
MWD_GR (API)
0
0
0
9150
9200
9250
9300
9350
7080 TVD
FT. HAYS LIMESTONE
MD 9157 TVD 7127.9
INC 88.4 AZ 180.6
VS 1870.84
7130
MD 9245 TVD 7129.44
INC 89.6 AZ 180.3
VS 1958.82
CODELL SANDSTONE
MD 9332 TVD 7129.44
INC 90.4 AZ 181
VS 2045.82
SS (80%): lt med gryish brn, translcnt-lt gry grns ip, f-vf grn, rnd-sbrnd, mod-w srtd, mod cmntd, fri ip, sl calc, no pri flour, no cut flour; LS (20%): lt gry-off wht, lt gry brn ip, sbblky-blky, bldd & shrp ip, frm-hd, semi cln, no vis por, abndt mnrl fluor.
SS: lt med gryish brn, translcnt-lt gry grns ip, f-vf grn, rnd-sbrnd, mod-w srtd, mod cmntd, fri ip, sl calc, no pri flour, no cut flour; Tr LS: lt gry-off wht, lt gry brn ip, sbblky-blky, bldd & shrp ip, frm-hd, semi cln, no vis por, abndt mnrl fluor, Tr SH.
7180
10000
10000
10000
10000
10000
TG (units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)
0
0
0
MW 9.6
VIS 41
BG 1200 - 1400 u


500
10000
200
ROP(ft/hr)
Total gas (units)
MWD_GR (API)
0
0
0
9400
9450
9500
9550
7080 TVD
Gas Buster Online
7130
MD 9502 TVD 7127.81
INC 90.7 AZ 181.1
VS 2215.81
SS: lt med gryish brn, translcnt-lt gry grns ip, f-vf grn, rnd-sbrnd, mod-w srtd, mod cmntd, fri ip, mod-sl calc, no pri flour, v slw wk diff yel flour, no res cut; Tr LS: lt gry-off wht, lt gry brn ip, sbblky-blky, bldd & shrp ip, frm-hd, semi cln, no vis por, abndt mnrl fluor, Tr SH.
SS: lt med gryish brn, translcnt-lt gry grns ip, f-vf grn, rnd-sbrnd, mod-w srtd, mod cmntd, fri ip, mod-sl calc, no pri flour, v slw wk diff yel flour, no res cut; Tr SH.
SS: lt med gryish brn, tra
f-vf grn, rnd-sbrnd, mod-
mod-sl calc, no pri flour,
res cut; Tr SH.
7180
10000
10000
10000
10000
10000
Tg (units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)
0
0
0
MW 9.7
VIS 42
WOB 5.3
RPM 69
SPP 3637
SPM 82/0
ROP 414


500
10000
200
ROP (ft/hr)
Total gas (units)
MWD_GR (API)
0
0
0
9600
9650
9700
9750
98
7080 TVD
Gas Buster Online
MD 9674 TVD 7126.31
INC 90.3 AZ 181.5
VS 2387.8
7130
SS (90%): lt med gryish brn, translcnt-lt gry grns ip, f-vf grn, rnd-sbrnd, mod-w srtd, mod cmntd, fri ip, mod-sl calc, no pri flour, v slw wk diff yel flour, no res cut; SH (10%).
SS (90%): lt med gryish brn, translcnt-lt gry grns ip, f-vf grn, rnd-sbrnd, mod-w srtd, mod cmntd, fri ip, mod-sl calc, no pri flour, v slw wk diff yel flour, no res cut; SH (10%).
7180
10000
10000
10000
10000
C1 (units)
C2 (units)
C3 (units)
C4 (units)
0
0
0
BG 1200 - 1600 u

500
10000
200
ROP (ft/hr)
Total gas (units)
MWD_GR (API)
0
0
0

500
10000
200
ROP (ft/hr)
Total gas (units)
MWD_GR (API)
0
0
0

00 | 9850 | 9900 | 9950 | 10000

7080 TVD

7080 TVD

Gas Bu

FT. HAYS LIMESTONE

7130

CODELL SANDSTONE

MD 9847 TVD 7126.31
INC 89.7 AZ 183.4
VS 2560.72

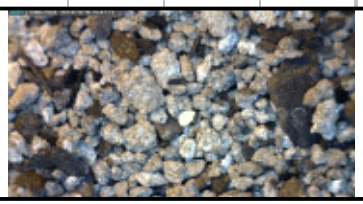
7130

SS (90%): lt med gryish brn, translcnt-lt gry grns ip, f-vf grn, rnd-sbrnd, mod-w srtd, mod cmntd, fri ip, mod-sl calc, no pri flour, v slw wk diff yel flour, no res cut; SH (10%).

SS (90%): lt med gryish brn, translcnt-lt gry grns ip, f-vf grn, rnd-sbrnd, mod-w srtd, mod cmntd, fri ip, mod-sl calc, no pri flour, v slw wk diff yel flour, no res cut; SH (10%).

7180

7180

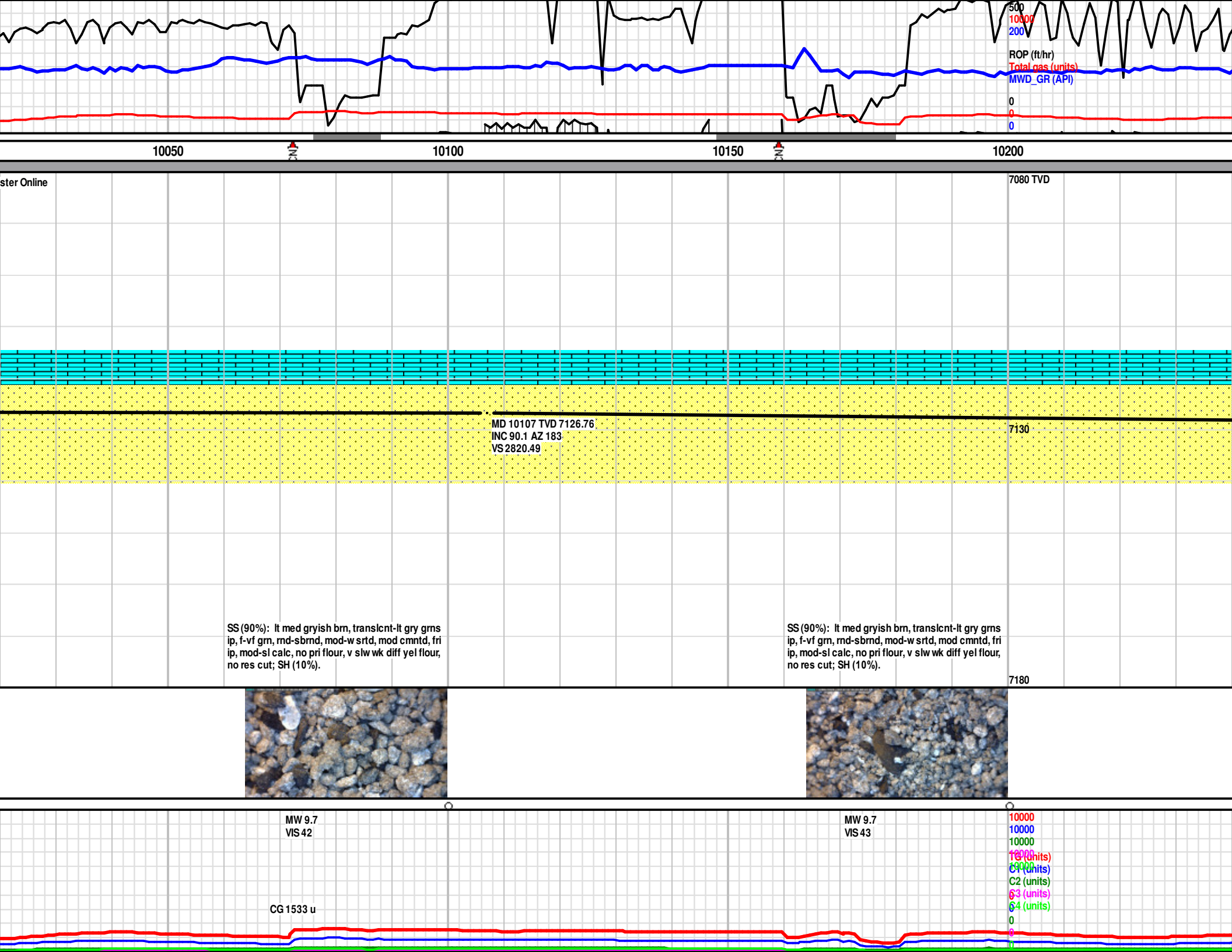


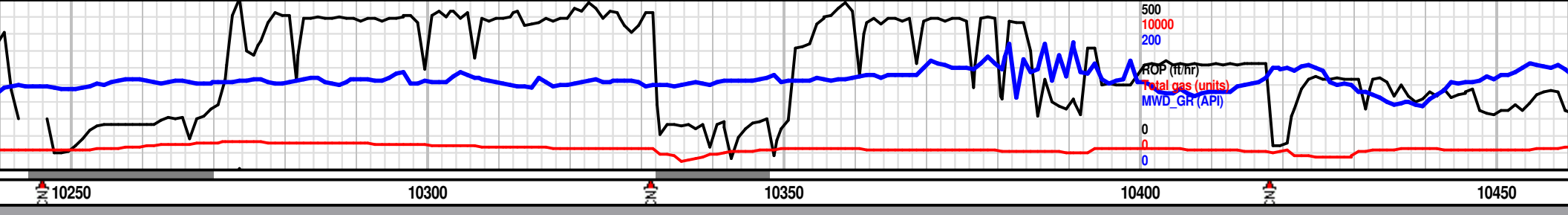
10000
10000
10000
10000
C1 (units)
C2 (units)
C3 (units)
C4 (units)
0
0
0

MW 9.7
VIS 42

WOB 3.0
RPM 71
SPP 3614
SPM 82/0
ROP 243

10000
10000
10000
10000
C1 (units)
C2 (units)
C3 (units)
C4 (units)
0
0
0


500
10000
200
ROP (ft/hr)
Total gas (units)
MWD_GR (API)
0
0
0
10050
10100
10150
10200
ster Online
7080 TVD
MD 10107 TVD 7126.76
INC 90.1 AZ 183
VS 2820.49
7130
SS (90%): lt med gryish brn, translcnt-lt gry grns ip, f-vf grn, rnd-sbrnd, mod-w srtd, mod cmntd, fri ip, mod-sl calc, no pri flour, v slw wk diff yel flour, no res cut; SH (10%).
SS (90%): lt med gryish brn, translcnt-lt gry grns ip, f-vf grn, rnd-sbrnd, mod-w srtd, mod cmntd, fri ip, mod-sl calc, no pri flour, v slw wk diff yel flour, no res cut; SH (10%).
7180
MW 9.7
VIS 42
MW 9.7
VIS 43
10000
10000
10000
C1 (units)
C2 (units)
C3 (units)
C4 (units)
0
CG 1533 u



Gas Buster Online

7080 TVD

FT. HAYS LIMESTONE

MD 10279 TVD 7128.56
INC 88.7 AZ 181.2
VS 2992.43

7130

CODELL SANDSTONE

MD 10451
INC 88.9 A
VS 3164.39

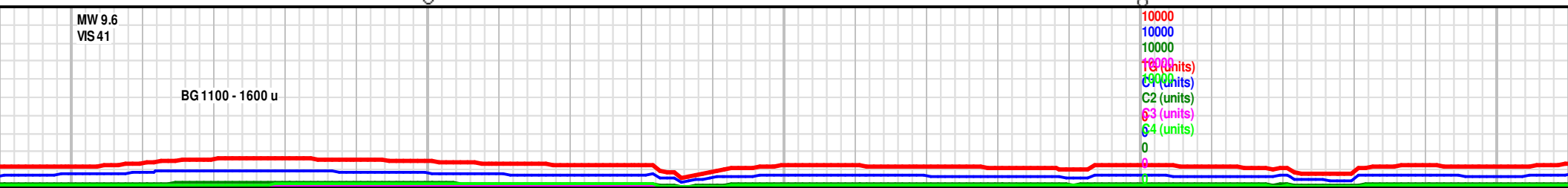
SS (90%): lt med gryish brn, translcnt-lt gry grns ip, f-vf grn, rnd-sbrnd, mod-w srtd, mod cmntd, fri ip, mod-sl calc, no pri flour, v slw wk diff yel flour, no res cut; SH (10%), Tr LS.

SS (90%): lt med gryish brn, translcnt-lt gry grns ip, f-vf grn, rnd-sbrnd, mod-w srtd, mod cmntd, fri ip, mod-sl calc, no pri flour, v slw wk diff yel flour, no res cut; SH (10%).

7180

MW 9.6
VIS 41

BG 1100 - 1600 u



500
10000
200
ROP (ft/hr)
Total gas (units)
MWD_GR (API)
0
0
0

10500 | 10550 | 10600 | 10650

7080 TVD

Gas Buster Online

7130

TVD 7132.16
Z 181
9

MD 10538 TVD 7133.76
INC 89 AZ 180.4
VS 3251.37

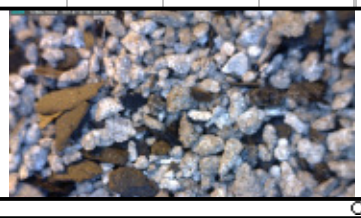
MD 10625 TVD 7134.52
INC 90 AZ 179.8
VS 3338.36

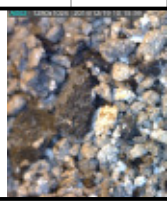
SS (80%): lt med gryish brn, translcnt-lt gry grns ip, f-vf grn, rnd-sbrnd, mod-w srtd, mod cmntd, fri ip, mod-sl calc, no pri flour, v slw wk diff yel flour, no res cut; SH (20%).

SS (95%): lt-lt med gryish brn, med grybrn thru, mstly v f grn w occ L f grns, rnd-sbrnd, w srtd, mod cmt, v fri, non-v sl calc, drty snd w abndt sftr shly incls, 10% est vis por, drk tan o stn, pred non fluor w rr dim even fluor, wk strmng cldy cuts, gd yelish grn res cld, strng gsy odor, tr blk carb SH

SS (98%): lt med gryish brn, me grn w occ f grns, rnd-sbrnd, w s uncon, non-v sl calc, drty snd w incls, 11% est vis por, drk tan o w rr dim even fluor, wk strmng c grn res cld, strng gsy odor, tr bl

7180





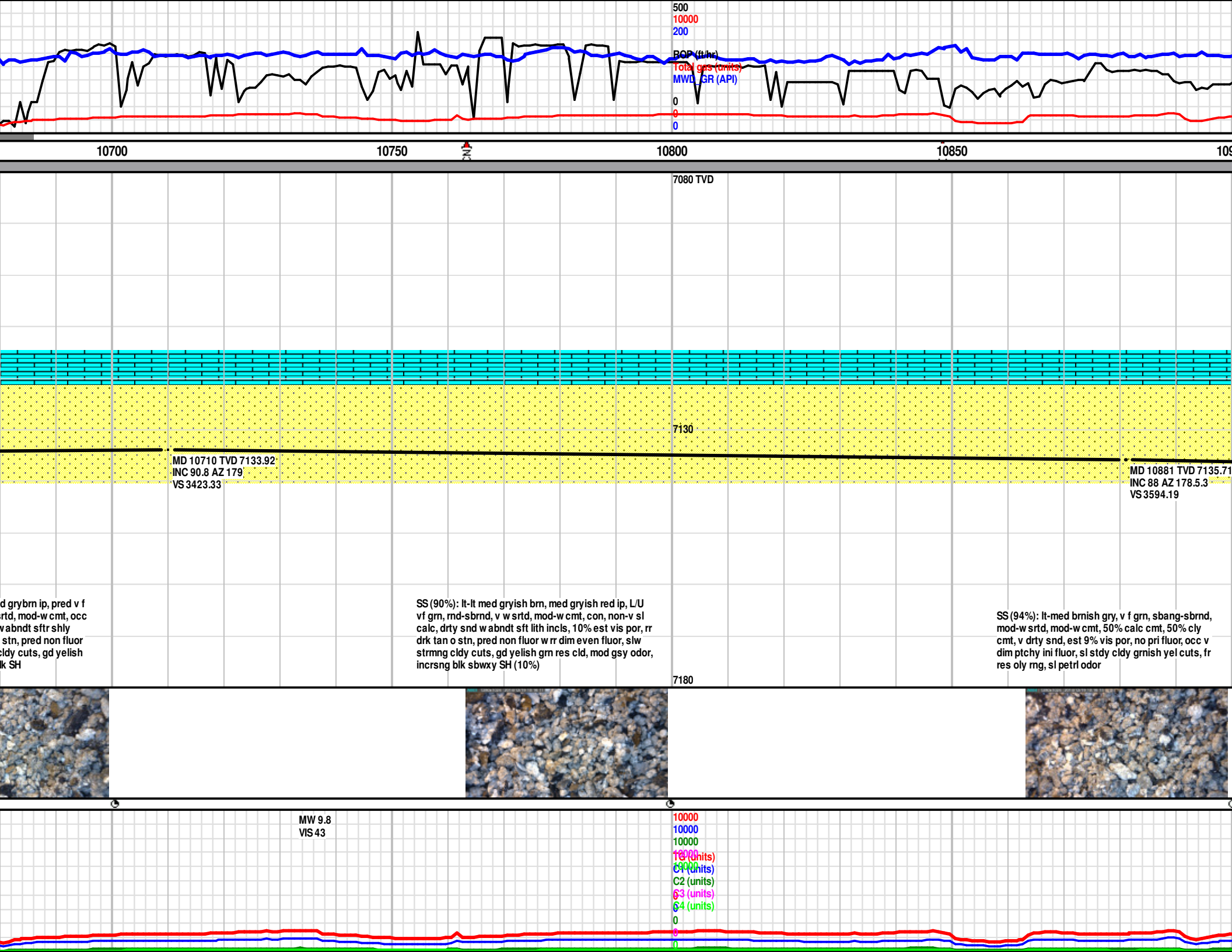
WOB 9.8
RPM 59
SPP 3419
SPM 83/0
ROP 194

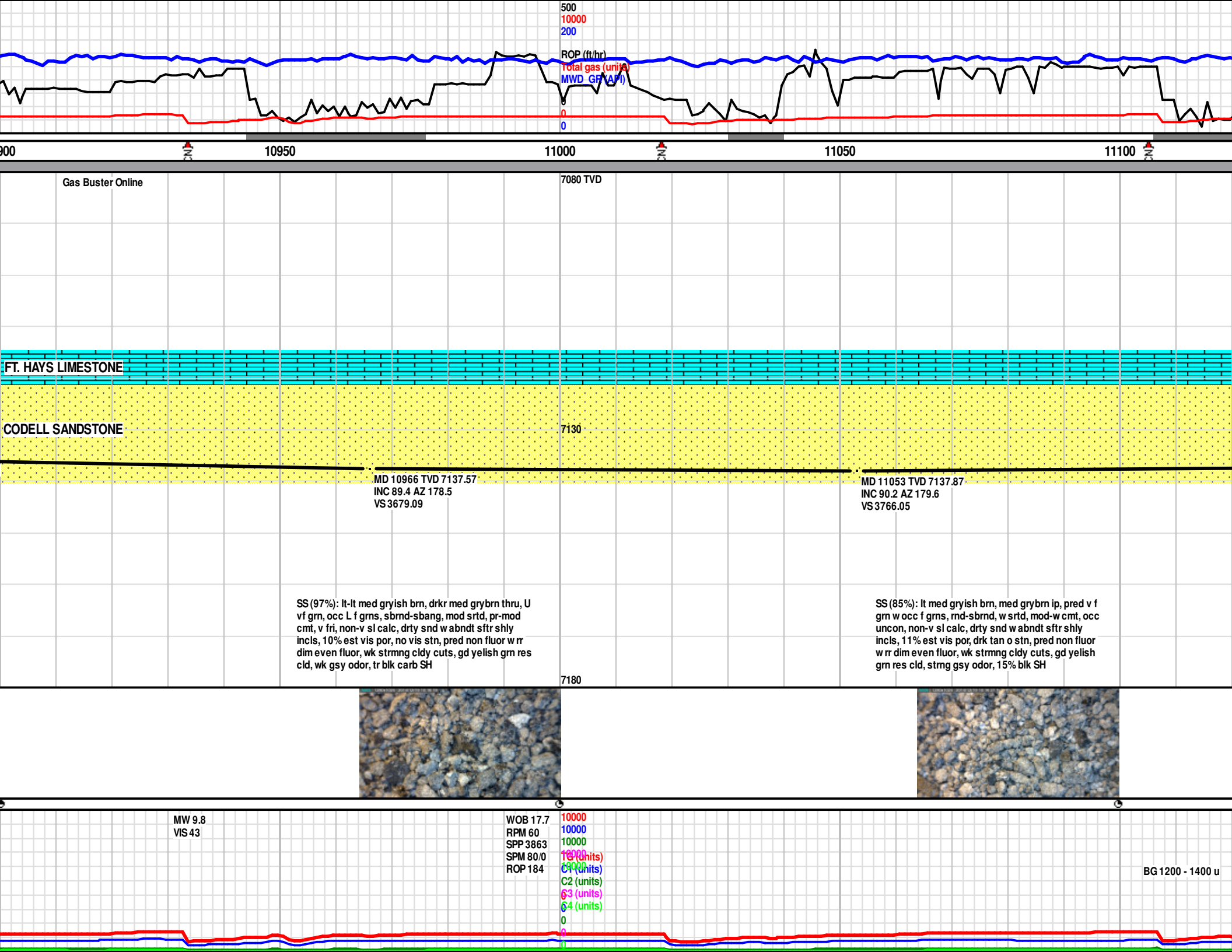
Mud Data @ 10526'
Wt 9.7
Vis 38
PV/YP 12/10
Gels 3/11/17
Fil 5.0
Sol 7.6
pH 8.5
Cl 5700
Hd 80

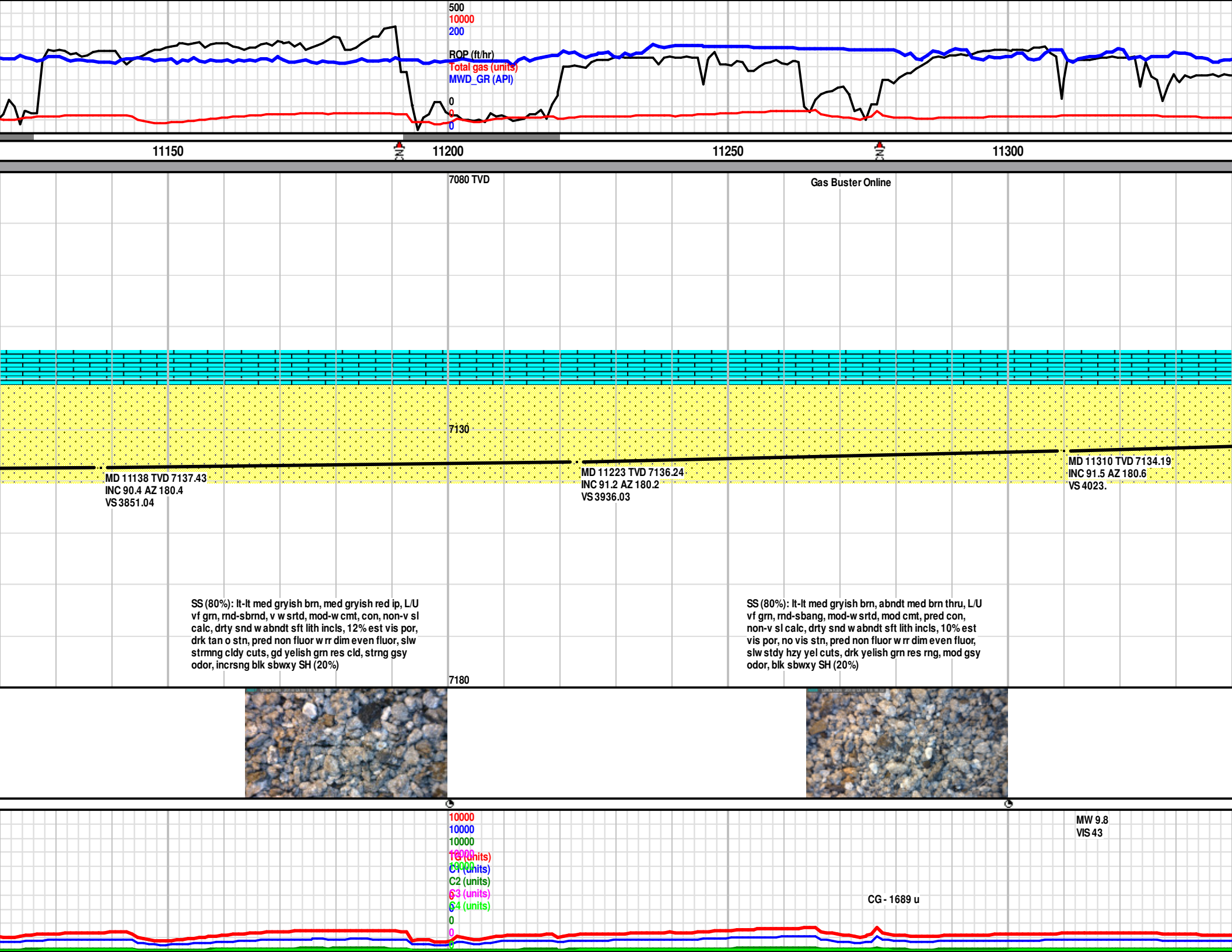
MW 9.6
VIS 41

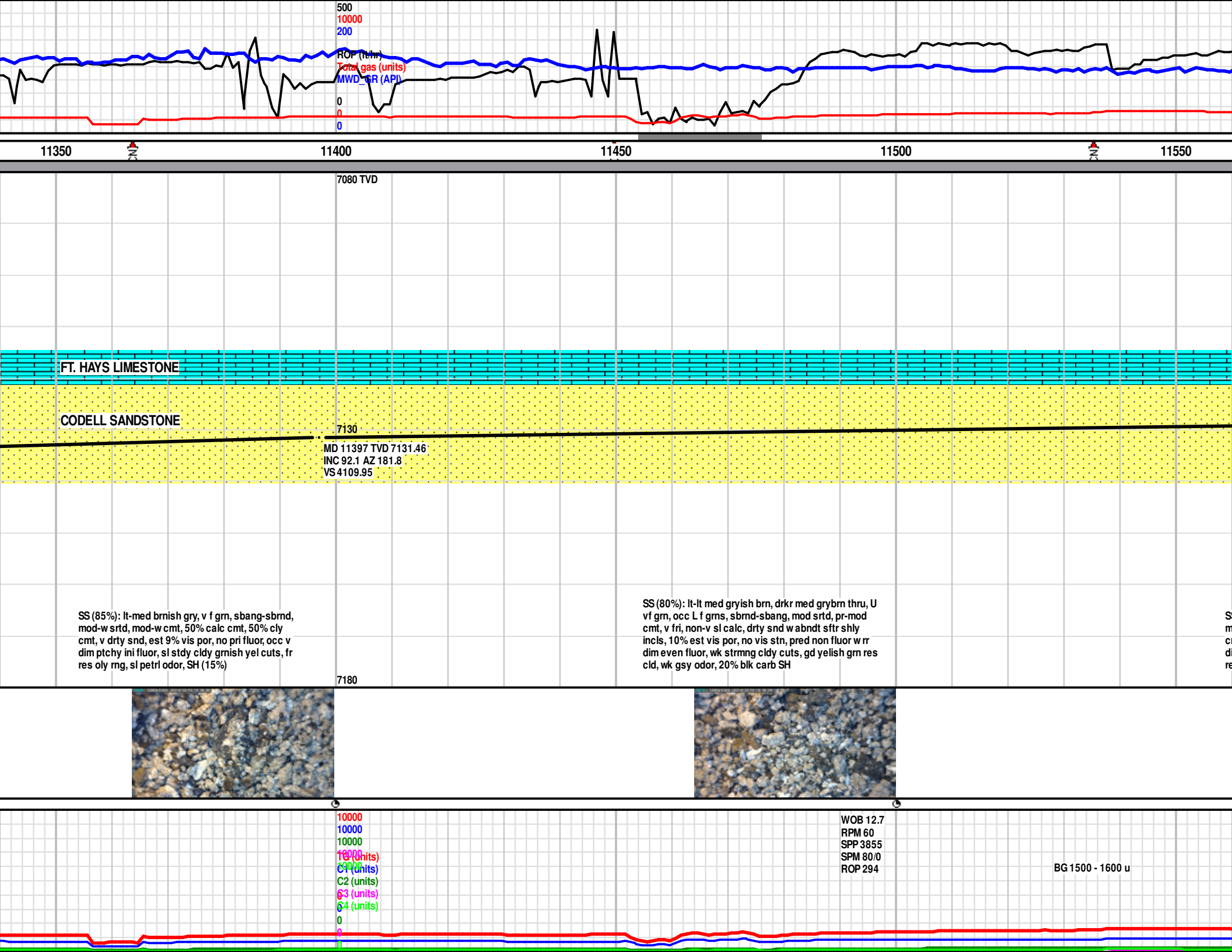
10000
10000
10000
10000
C1 (units)
C2 (units)
C3 (units)
C4 (units)
0
0
0

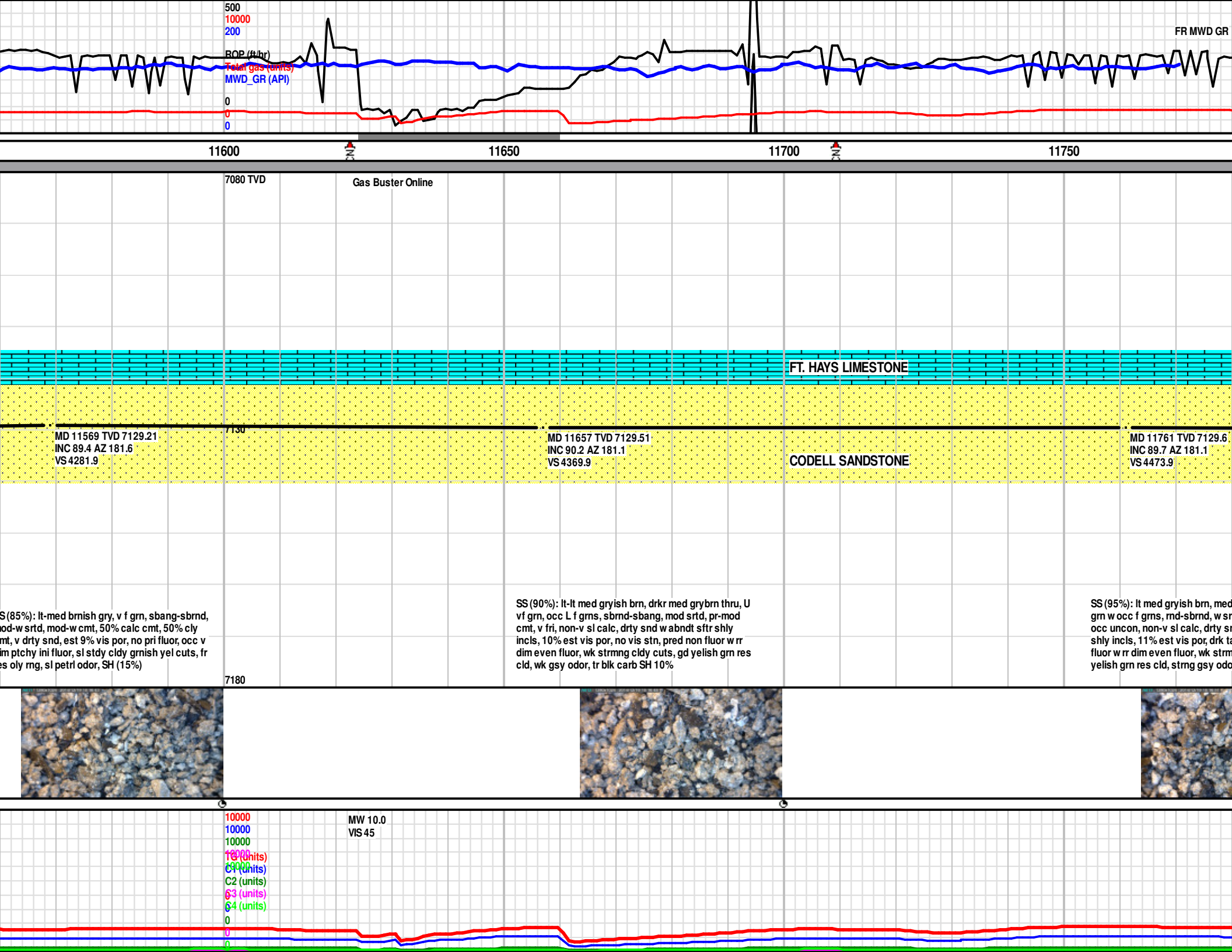
BG 900 - 1300 u


500
10000
200
ROP (ft/hr)
Total gas (units)
MWD_GR (API)
0
0
0
10700
10750
10800
10850
7080 TVD
7130
7180
MD 10710 TVD 7133.92
INC 90.8 AZ 179
VS 3423.33
MD 10881 TVD 7135.71
INC 88 AZ 178.5.3
VS 3594.19
d grybrn ip, pred v f
srtd, mod-w cmt, occ
w abndt sftr shly
stn, pred non fluor
cldy cuts, gd yelish
lk SH
SS (90%): lt-lt med gryish brn, med gryish red ip, L/U vf grn, rnd-sbrnd, v w srtd, mod-w cmt, con, non-v sl calc, drty snd w abndt sft lith incls, 10% est vis por, rr drk tan o stn, pred non fluor w rr dim even fluor, slw strmng cldy cuts, gd yelish grn res cld, mod gsy odor, incrsng blk sbwxy SH (10%)
SS (94%): lt-med brnish gry, v f grn, sbang-sbrnd, mod-w srtd, mod-w cmt, 50% calc cmt, 50% cly cmt, v drty snd, est 9% vis por, no pri fluor, occ v dim ptchy ini fluor, sl stdy cldy grnish yel cuts, fr res oly rng, sl petrl odor
MW 9.8
VIS 43
10000
10000
10000
10000
10000
TG (units)
C1 (units)
C2 (units)
C3 (units)
C4 (units)
0
0
0


500
10000
200
ROP (ft/hr)
Total gas (units)
MWD_GR (API)
0
0
900
10950
11000
11050
11100
Gas Buster Online
7080 TVD
FT. HAYS LIMESTONE
CODELL SANDSTONE
7130
MD 10966 TVD 7137.57
INC 89.4 AZ 178.5
VS 3679.09
MD 11053 TVD 7137.87
INC 90.2 AZ 179.6
VS 3766.05
SS (97%): lt-lt med gryish brn, drkr med grybrn thru, U vf grn, occ L f grns, sbrnd-sbang, mod srtd, pr-mod cmt, v fri, non-v sl calc, drty snd w abndt sftr shly incls, 10% est vis por, no vis stn, pred non fluor w rr dim even fluor, wk strmng cldy cuts, gd yelish grn res cld, wk gsy odor, tr blk carb SH
SS (85%): lt med gryish brn, med grybrn ip, pred v f grn w occ f grns, rnd-sbrnd, w srtd, mod-w cmt, occ uncon, non-v sl calc, drty snd w abndt sftr shly incls, 11% est vis por, drk tan o stn, pred non fluor w rr dim even fluor, wk strmng cldy cuts, gd yelish grn res cld, strng gsy odor, 15% blk SH
7180
MW 9.8
VIS 43
WOB 17.7
RPM 60
SPP 3863
SPM 80/0
ROP 184
10000
10000
10000
10000
10000
C1 (units)
C2 (units)
C3 (units)
C4 (units)
0
0
0
BG 1200 - 1400 u


500
10000
200
ROP (ft/hr)
Total gas (units)
MWD_GR (API)
0
0
0
11150
11200
11250
11300
7080 TVD
Gas Buster Online
7130
MD 11138 TVD 7137.43
INC 90.4 AZ 180.4
VS 3851.04
MD 11223 TVD 7136.24
INC 91.2 AZ 180.2
VS 3936.03
MD 11310 TVD 7134.19
INC 91.5 AZ 180.6
VS 4023.
SS (80%): lt-lt med gryish brn, med gryish red ip, L/U vf grn, rnd-sbrnd, v w srtd, mod-w cmt, con, non-v sl calc, drty snd w abndt sft lith incls, 12% est vis por, drk tan o stn, pred non fluor w rr dim even fluor, slw strmng cldy cuts, gd yelish grn res cld, strng gsy odor, incrsng blk sbwxy SH (20%)
SS (80%): lt-lt med gryish brn, abndt med brn thru, L/U vf grn, rnd-sbang, mod-w srtd, mod cmt, pred con, non-v sl calc, drty snd w abndt sft lith incls, 10% est vis por, no vis stn, pred non fluor w rr dim even fluor, slw stdy hzy yel cuts, drk yelish grn res rng, mod gsy odor, blk sbwxy SH (20%)
7180
10000
10000
10000
10000
C1 (units)
C2 (units)
C3 (units)
C4 (units)
0
0
0
MW 9.8
VIS 43
CG - 1689 u


500
10000
200
ROP (ft/hr)
Total gas (units)
MWD_GR (API)
0
0
0
11350
11400
11450
11500
11550
7080 TVD
FT. HAYS LIMESTONE
CODELL SANDSTONE
7130
MD 11397 TVD 7131.46
INC 92.1 AZ 181.8
VS 4109.95
SS (85%): lt-med brnish gry, v f grn, sbang-sbrnd, mod-w srtd, mod-w cmt, 50% calc cmt, 50% cly cmt, v drty snd, est 9% vis por, no pri fluor, occ v dim ptchy ini fluor, sl stdy cldy grnish yel cuts, fr res oly rng, sl petrl odor, SH (15%)
SS (80%): lt-lt med gryish brn, drkr med grybrn thru, U vf grn, occ L f grns, sbrnd-sbang, mod srtd, pr-mod cmt, v fri, non-v sl calc, drty snd w abndt sftr shly incls, 10% est vis por, no vis stn, pred non fluor w rr dim even fluor, wk strmng cldy cuts, gd yelish grn res cld, wk gsy odor, 20% blk carb SH
7180
10000
10000
10000
10000
C1 (units)
C2 (units)
C3 (units)
C4 (units)
0
0
0
WOB 12.7
RPM 60
SPP 3855
SPM 80/0
ROP 294
BG 1500 - 1600 u


500
10000
200
ROP (ft/hr)
Total gas (units)
MWD_GR (API)
0
0
0
FR MWD GR
11600
11650
11700
11750
7080 TVD
Gas Buster Online
FT. HAYS LIMESTONE
CODELL SANDSTONE
7130
MD 11569 TVD 7129.21
INC 89.4 AZ 181.6
VS 4281.9
MD 11657 TVD 7129.51
INC 90.2 AZ 181.1
VS 4369.9
MD 11761 TVD 7129.6
INC 89.7 AZ 181.1
VS 4473.9
S (85%): lt-med brnish gry, v f grn, sbang-sbrnd,
od-w srtd, mod-w cmt, 50% calc cmt, 50% cly
mt, v drty snd, est 9% vis por, no pri fluor, occ v
im ptchy ini fluor, sl stdy cldy grnish yel cuts, fr
es oly rng, sl petrl odor, SH (15%)
SS (90%): lt-lt med gryish brn, drkr med grybrn thru, U
vf grn, occ L f grns, sbrnd-sbang, mod srtd, pr-mod
cmt, v fri, non-v sl calc, drty snd w abndt sftr shly
incls, 10% est vis por, no vis stn, pred non fluor w rr
dim even fluor, wk strmng cldy cuts, gd yelish grn res
cld, wk gsy odor, tr blk carb SH 10%
SS (95%): lt med gryish brn, med
grn w occ f grns, rnd-sbrnd, w sr
occ uncon, non-v sl calc, drty sr
shly incls, 11% est vis por, drk ta
fluor w rr dim even fluor, wk strm
yelish grn res cld, strng gsy odo
7180
10000
10000
10000
10000
10000
MW 10.0
VIS 45
C1 (units)
C2 (units)
C3 (units)
C4 (units)
0
0
0

500
10000
200

ROP (ft/hr)
Total gas (units)
MWD_GR (API)

0
0
0

11800 11850 11900

7080 TVD

DMTD reached 08:30 Hrs, December 19, 2014

Short Trip @ 11,814' DMTD, condition hole, hang 4 1/2" production liner.

FORMATION TOPS

Sharon Springs	6,951' MD (6,771' TVD)
Niobrara A	7,020' MD (6,832' TVD)
Niobrara B Chalk	7,072' MD (6,875' TVD)
Niobrara C Chalk	7,184' MD (6,959' TVD)
Fort Hays LS	7,456' MD (7,095' TVD)
Codell SS	7,538' MD (7,117' TVD)
DMTD	11,814' MD

7180

Proj. to Bit
MD 11814 TVD 7129.88
INC 89.7 AZ 181.1
VS -4526.9

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r, 5% blk SH

7180

Thank You
Goolsby Brothers & Assoc.
Shelton Davis & Larry Goolsby

10000
10000
10000
10000
10000
C1 (units)
C2 (units)
C3 (units)
C4 (units)
0
0
0

Mud Data @ 11814'
Wt 10.1
Vis 50
PV/YP 21/17
Gels 5/22/37
Fil 4.2
Sol 10.6
pH 9.3
Cl 5900
Hd 80