



Company : Apache

Well : Elver-1

Interval : 3239.00 - 4675.67 meters

Created : 09/Jan/2009 8:04:19 AM

INTEQ

FORMATION EVALUATION LOG

Drilling Rate		MD meters 1:500	TVDRT meters	Cuttings Lithology	Oil Show	Visual Inferred Porosity	Gas Data		Chromatograph Data		Calcmetry	Interpreted Lithology	Lithology Description
ROP (m/hr)	ROP (m/hr)						Gas Hydrocarbon Avg %	Methane ppm	Ethane ppm	Propane ppm			
200	200	240	92.0				0.1 1 10 100	1	100000	1	100000	244mm (9 5/8") casing shoe @ 3243.9 mMDRT	
180	180	3250	3250				Resistivity Shallow	1000	1	1	100000	Reached 311mm (12 1/4") section TD @ 3248.9 mMDRT @ 1300 hrs on 29th December 2008	
160	160	3260	2505.6				ohm.m		1	1	100000	POOH @ 3252.0 mMDRT to change the failed MWD tool	
140	140	3270	3270				Resistivity Deep	1000	1	1	100000	CALCAREOUS CLAYSTONE: med gy-med lt gy, lt olv gy, abdt calc grd to CLCLT, tr micmic, tr v f glauc, tr v f-med carb spks, tr dissem pyr, tr ang qtz, tr microfos, sft-frm, amor-sbblky	
120	120	3280	3280				ohm.m		1	1	100000		
100	100	3290	2519.2						1	1	100000	CALCAREOUS CLAYSTONE: med gy-med lt gy, lt olv gy, abdt calc grd to MARL, tr micmic, tr v f glauc, tr v f-med carb spks, tr dissem pyr, tr ang qtz, tr microfos, sft-frm, amor-sbblky	
80	80	3300	3300						1	1	100000		
60	60	3310	2533.0						1	1	100000	CALCAREOUS CLAYSTONE: med gy-med lt gy, lt olv gy, abdt calc grd to MARL, tr micmic, tr v f glauc, tr v f-med carb spks, tr dissem pyr, tr ang qtz, tr microfos, sft-frm, amor-sbblky	
40	40	3320	3320						1	1	100000		
20	20	3330	2546.9						1	1	100000	CALCAREOUS CLAYSTONE: med gy-med lt gy, lt olv gy, abdt calc grd to MARL, tr micmic, tr v f glauc, tr v f-med carb spks, tr dissem pyr, tr ang qtz, tr microfos, sft-frm, amor-sbblky	

GPM: 805-880

SPP: 3880-4250psi

NB4 Smith Mi716
 216 mm (8 1/2")
 Jets: 7x13
 Depth In: 3248.9m
 Depth Out: 3252.0m
 Drilled: 3.1 m in 0.3 hrs
 Grade: 0-1-BT-Z-X-I-PN-DT

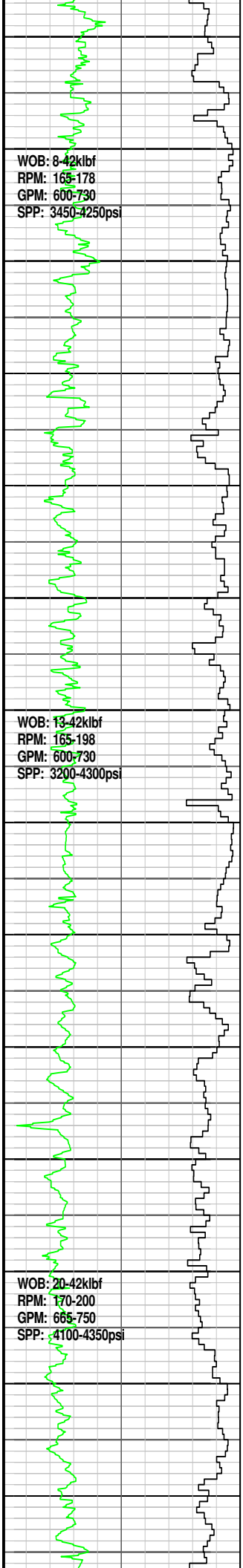
4RR1 Smith Mi716
 216mm (8 1/2")
 Jets: 7x13
 Depth In: 3252.0m
 Depth Out: 4433.0m
 Drilled: 1181.0 m in 63.7 hrs
 Grade: 3-1-CT-A-X-IN-BU-TQ

WOB: 8.41klbf
 RPM: 68.178
 GPM: 351-779
 SPP: 1712-4280psi

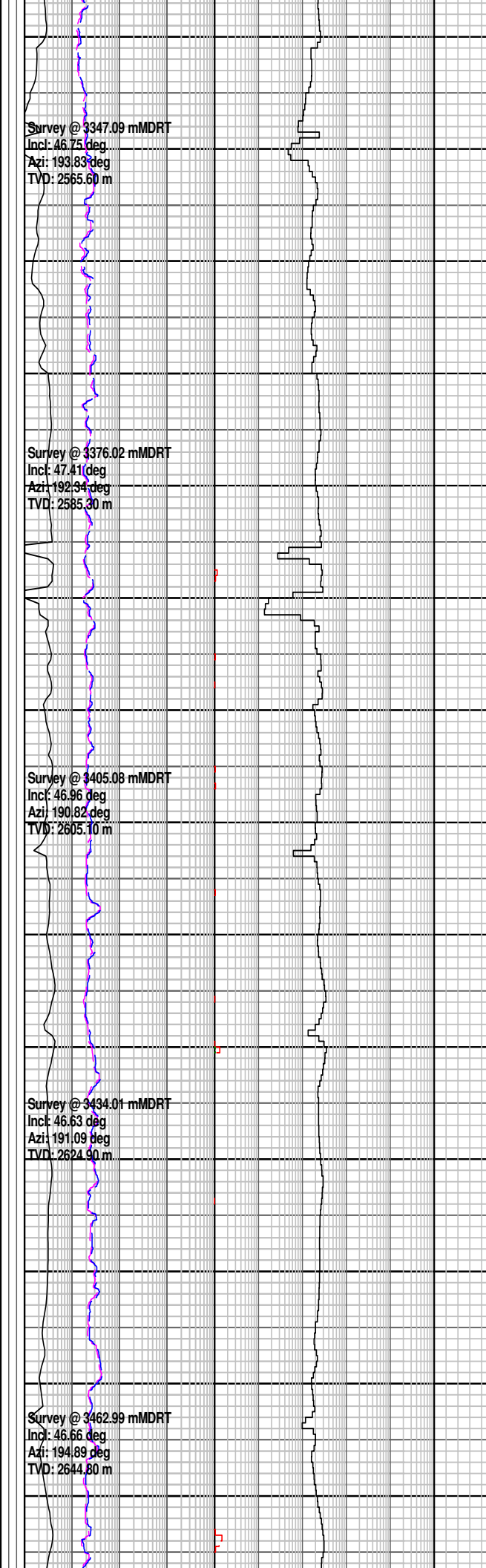
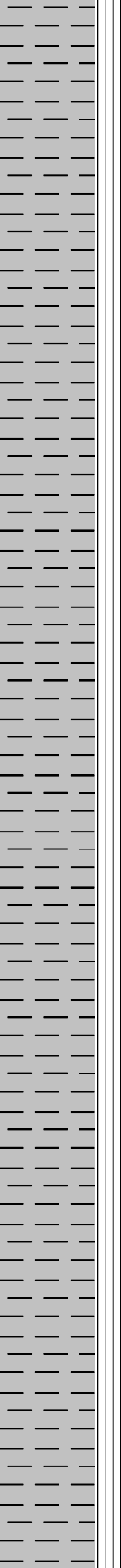
Survey @ 3258.55 mMDRT
 Incl: 47.12 deg
 Azi: 192.57 deg
 TVD: 2504.60 m

Survey @ 3289.21 mMDRT
 Incl: 46.56 deg
 Azi: 190.31 deg
 TVD: 2525.60 m

Survey @ 3318.02 mMDRT
 Incl: 45.87 deg
 Azi: 190.74 deg
 TVD: 2545.50 m



2560.7
2574.4
2587.9
2601.5
2615.2
2628.9
2642.6



micmic, tr v f glauc, tr v f-med carb spks, tr dissem pyr, tr ang qtz, tr microfos, sft-frm, amor-sbblky

CALCAREOUS CLAYSTONE:
med gy-med lt gy, lt olv gy, tr micmic, tr v f glauc, tr v f-med carb spks, tr pyr nod, tr ang qtz, tr microfos, sft-frm, amor-sbblky, sbfiss i/p

CALCAREOUS CLAYSTONE:
med gy-med lt gy, lt olv gy, tr micmic, tr v f glauc, tr v f-med carb spks, tr pyr nod, tr ang qtz, tr microfos, sft-frm, amor-sbblky, sbfiss i/p

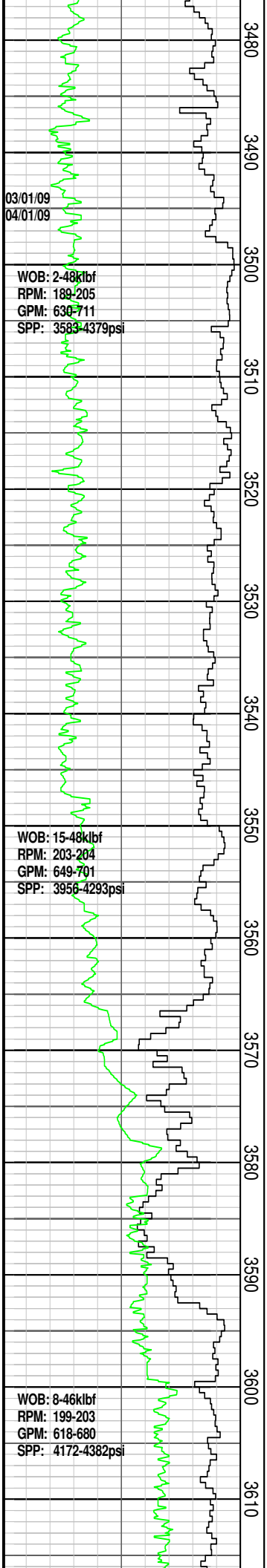
CALCAREOUS CLAYSTONE:
med gy-med lt gy, lt olv gy, tr micmic, tr f aren, tr v f glauc, tr v f-med carb spks, tr pyr nod, tr ang qtz, tr microfos, sft-frm, amor-sbblky, sbfiss i/p

CALCAREOUS CLAYSTONE:
med lt gy-med dk gy, lt olv gy-lt gnsh gy, mod calc, slt i/p, tr imcmic, tr v f glauc, tr v f aren, tr v f carb spks, dom frm-mod hd, amor-sbblky, tr sbfiss i/p

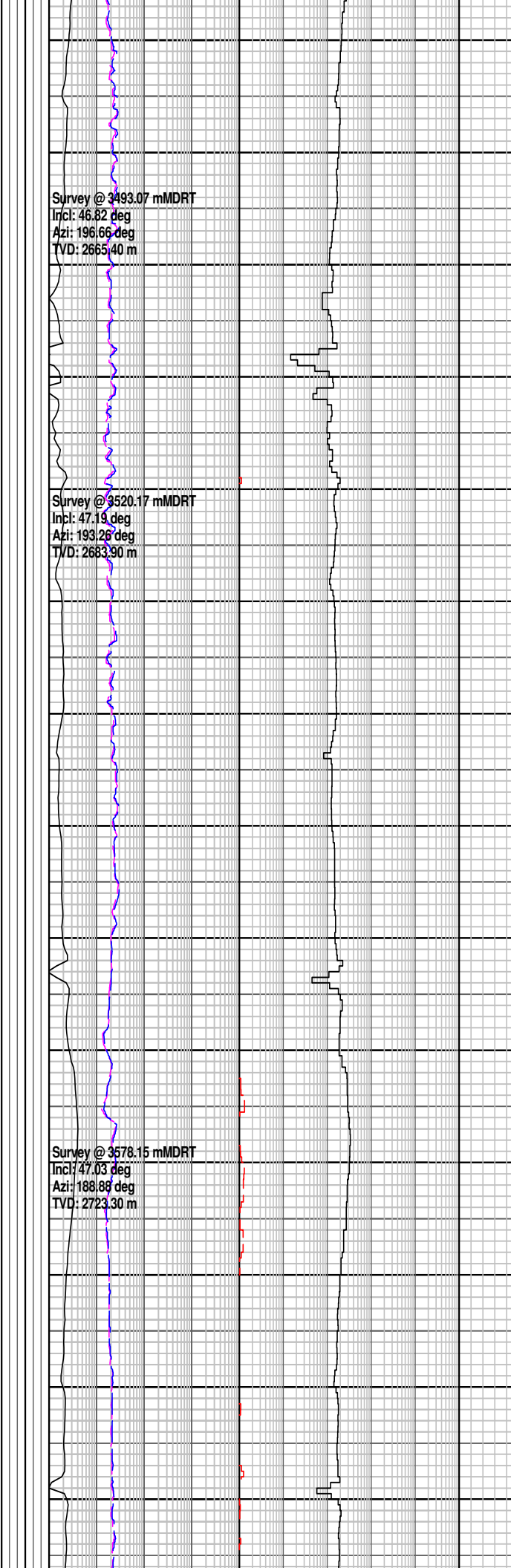
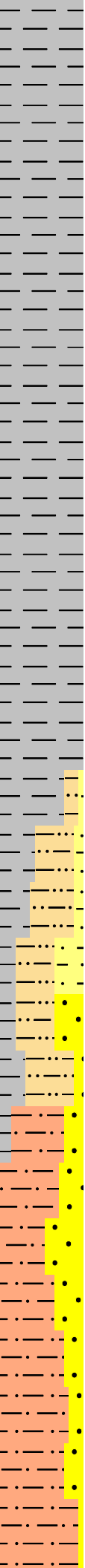
CALCAREOUS CLAYSTONE:
med lt gy-med dk gy, lt olv gy-lt gnsh gy, mod calc, slt i/p, tr imcmic, tr v f glauc, tr v f aren, tr v f carb spks, tr nod-dissem pyr, dom frm-mod hd, amor-sbblky

CALCAREOUS CLAYSTONE:
med lt gy-med dk gy, lt olv gy-lt gnsh gy, mod calc, slt i/p, tr imcmic, tr v f glauc, tr v f aren, tr v f carb spks, tr dissem pyr, dom frm-mod hd, amor-sbblky

CALCAREOUS CLAYSTONE:
med lt gy-med dk gy, lt olv gy-lt gnsh gy, mod calc, slt



2656.3
2670.0
2683.6
2697.2
2710.8
2724.4
2738.0



i/p, tr imcmic, tr v f glauc, tr v f aren, tr v f carb spks, tr dissem pyr, dom frm-mod hd, amor-sbblky

CALCAREOUS CLAYSTONE:
med lt gy-med dk gy, lt olv gy-lt gnsh gy, mod calc, slt i/p, tr imcmic, tr v f glauc, tr v f aren, tr v f carb spks, tr dissem pyr, dom frm-mod hd, amor-sbblky

MW: 1.15	FV: 70
PV: 19	YP: 31
pH: 10.0	CK: 6.0
GELS: 6/8/11	CL: 53000

CALCAREOUS CLAYSTONE:
med lt gy-med dk gy, lt olv gy-lt gnsh gy, mod calc, slt i/p, tr imcmic, tr v f glauc, tr v f aren, tr v f carb spks, tr dissem pyr, dom frm-mod hd, amor-sbblky

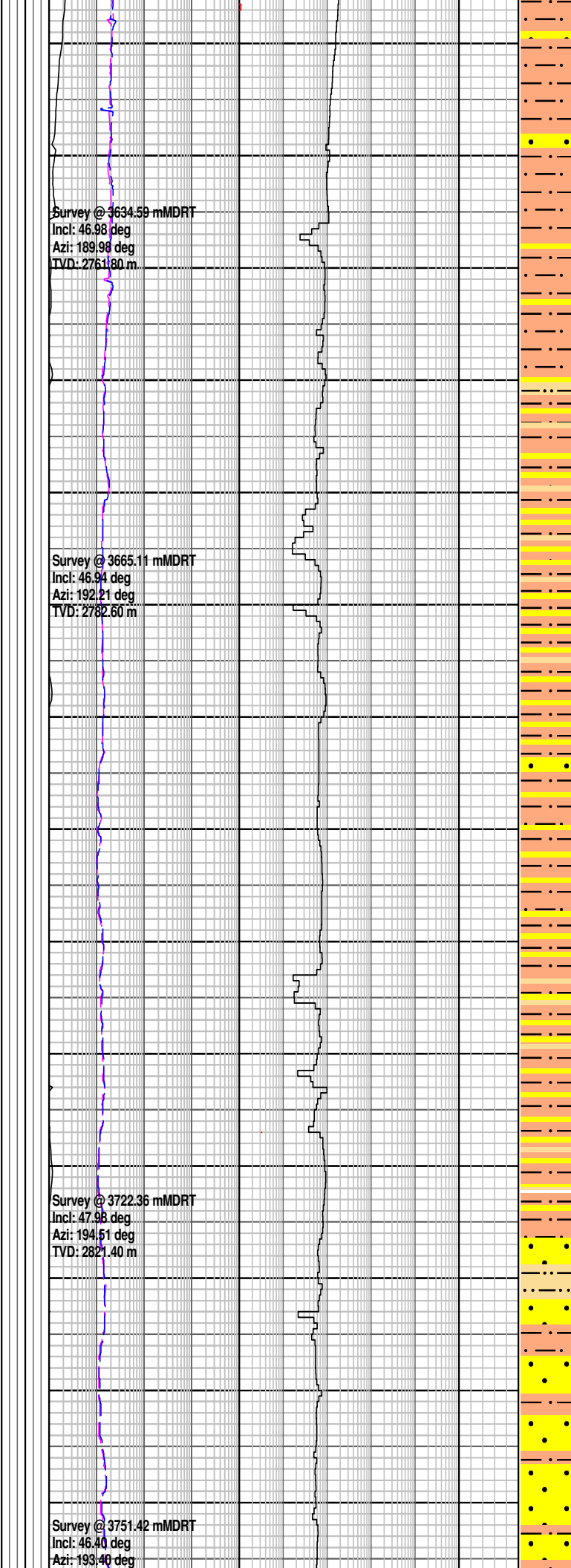
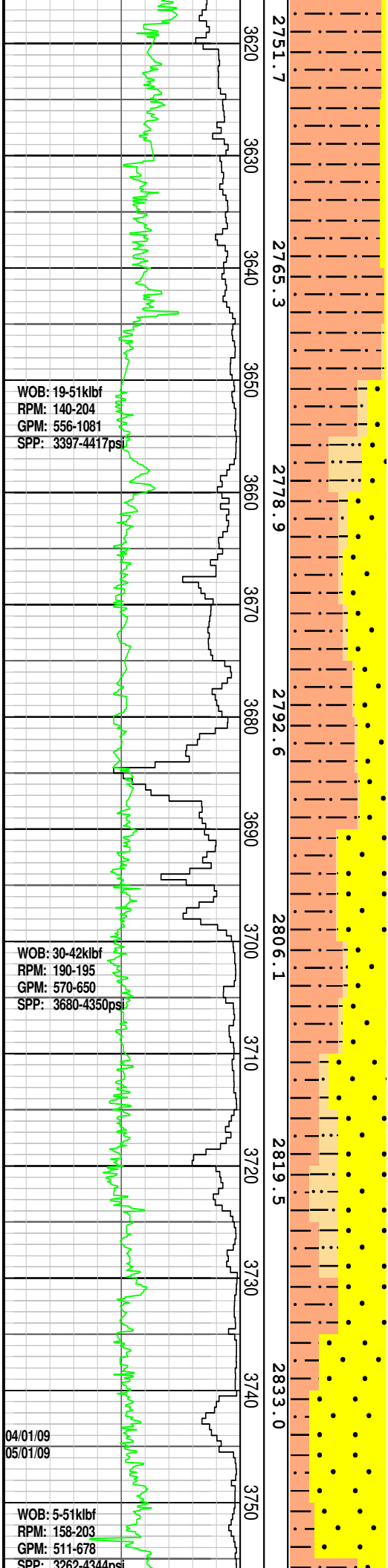
CALCAREOUS CLAYSTONE:
med lt gy-med dk gy, lt olv gy, lt gnsh gy, mod calc, v slt, tr imcmic, tr v f glauc, com v f aren grd to SDY
SLTST, tr v f carb spks, dom frm-mod hd, amor-sbblky

SANDY SILTSTONE: clr-trnsl, dom v f-f, wl srt, dom sbrnrd-rnnd, abdt slt mtx sft-frm agg, tr v f glauc, tr calc, p vis por, no hydc fluor

SILTSTONE: gy brn-dus brn, n calc, v aren grd to SANDY SILTSTONE, tr-com micmic, tr glauc, frm, dom sbfiss-sbblky

SANDSTONE: clr-trnsl, lt olv gy-pl yel brn, v f-dom f, tr med-crs, mod srt, dom sbrnrd-rnnd, occ sft-frm agg wt slt mtx, tr v f glauc, tr pyr nod, dom lse,p-fr vis por, no hydc fluor

SILTSTONE: gy brn-dus brn, dk olv gy, n calc, v aren grd to SANDY SILTSTONE, tr-com micmic, tr glauc, frm, dom sbfiss-sbblky



SILTSTONE: gy brn-dus brn, dk olv gy, n calc, v aren grd to SANDY SILTSTONE, tr-com micmic, tr glauc, frm, dom sbfiss-sbblyky

SANDSTONE: clr-trnsl, lt olv gy-pl yelsh brn, v f-dom f, tr med & crs, mod srt, dom sbrndd-rndd, occ sft-frm agg w/ v disp argl mtrx, tr-com v f glauc grd i/p to GLUAC SST, tr pyr nod, dom lse, p-fr por vis, no hydc fluor

GLAUCONITIC SANDSTONE: clr-trnsl, lt gnsh gy, dom v f-f, wl srt, dom sbrndd-rndd, sft to frm agg w/v disp argl & glauc mtrx, com to abdt v f glauc & glauc pel, occ lse, p vis por, no hydc fluor

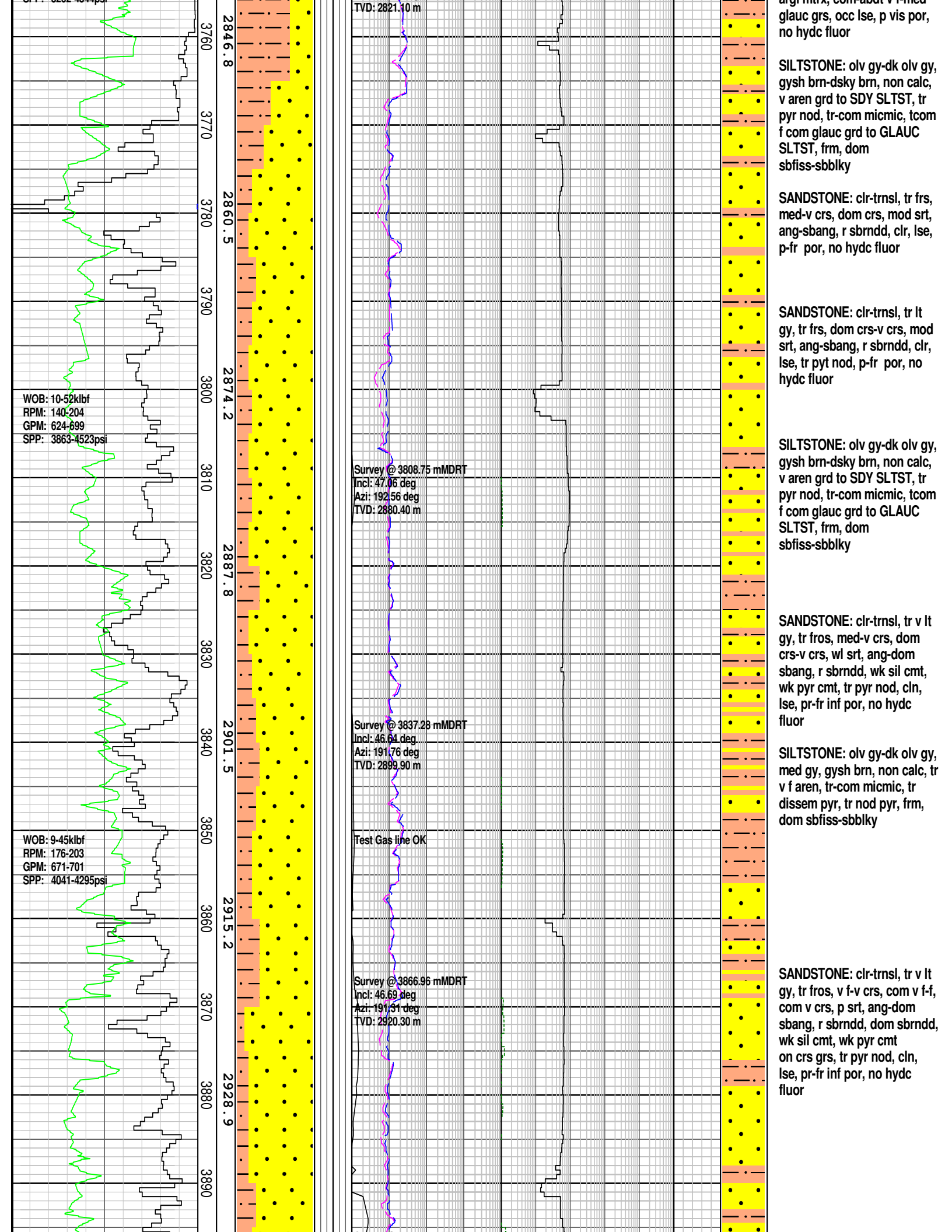
SILTSTONE: gysh brn-dsky olv gy, non calc, v aren, grd to SDY SLTST, tr disse pyr, tr pyr nod, tr-com micmic, tr-com glauc grd to GLAUC SLTST, frm, dom sbfiss-sbblyky

SANDY SILTSTONE: off wh-v lt gy, lt gnsh gy, com v f aren grs grd i/p to SLTY SST, tr calc, tr v f glauc, tr micmic, sft-dom frm, sbfiss-sbblyky

GLAUCONITIC SANDSTONE: clr-trnsl, lt gnsh gy, dom v f-f, wl srt, dom sbrndd-rndd, sft to frm agg w/ v disp lt gy-dk gnsh gy glauc argl mtrx, com-abdt v f-med glauc grs, occ lse, p vis por, no hydc fluor

SILTSTONE: olv gy-lt gy, gysh brn-dsky brn, non calc, v aren, grd to SDY SLTST, tr disse pyr, tr pyr nod, tr-com micmic, tr-com glauc grd to GLAUC SLTST, frm, dom sbfiss-sbblyky

GLAUCONITIC SANDSTONE: clr-trnsl, lt gnsh gy, dom v f-f, tr crs grs, wl srt, dom sbrndd-rndd, sft to frm agg w/ v disp lt gy-dk gnsh gy glauc argl mtrx, com-abdt v f-med



arg. mtrix, com-abdt v f med
glauc grs, occ lse, p vis por,
no hydc fluor

SILTSTONE: olv gy-dk olv gy,
gysh brn-dsky brn, non calc,
v aren grd to SDY SLTST, tr
pyr nod, tr-com micmic, tcom
f com glauc grd to GLAUC
SLTST, frm, dom
sbfiss-sbbiky

SANDSTONE: clr-trnsl, tr frs,
med-v crs, dom crs, mod srt,
ang-sbang, r sbrnrd, clr, lse,
p-fr por, no hydc fluor

SANDSTONE: clr-trnsl, tr lt
gy, tr frs, dom crs-v crs, mod
srt, ang-sbang, r sbrnrd, clr,
lse, tr pyt nod, p-fr por, no
hydc fluor

SILTSTONE: olv gy-dk olv gy,
gysh brn-dsky brn, non calc,
v aren grd to SDY SLTST, tr
pyr nod, tr-com micmic, tcom
f com glauc grd to GLAUC
SLTST, frm, dom
sbfiss-sbbiky

SANDSTONE: clr-trnsl, tr v lt
gy, tr fros, med-v crs, dom
crs-v crs, wl srt, ang-dom
sbang, r sbrnrd, wk sil cmt,
wk pyr cmt, tr pyr nod, cln,
lse, pr-fr inf por, no hydc
fluor

SILTSTONE: olv gy-dk olv gy,
med gy, gysh brn, non calc, tr
v f aren, tr-com micmic, tr
dissem pyr, tr nod pyr, frm,
dom sbfiss-sbbiky

SANDSTONE: clr-trnsl, tr v lt
gy, tr fros, v f-v crs, com v f-f,
com v crs, p srt, ang-dom
sbang, r sbrnrd, dom sbrnrd,
wk sil cmt, wk pyr cmt
on crs grs, tr pyr nod, cln,
lse, pr-fr inf por, no hydc
fluor

WOB: 10-52klbf
RPM: 140-204
GPM: 624-699
SPP: 3863-4523psi

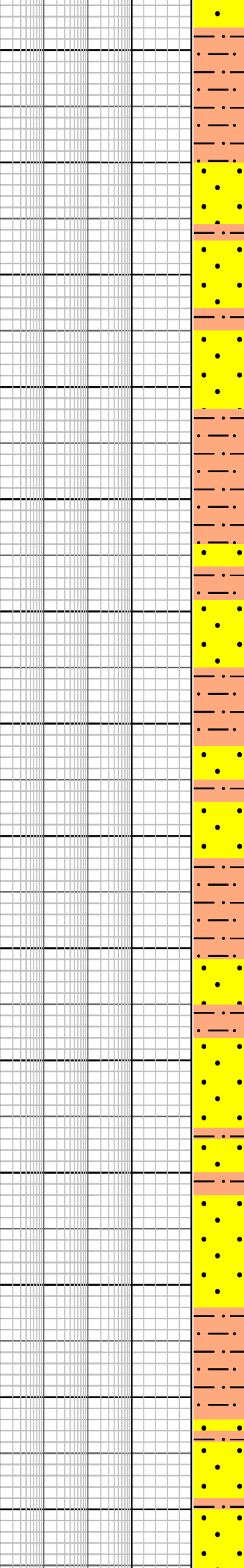
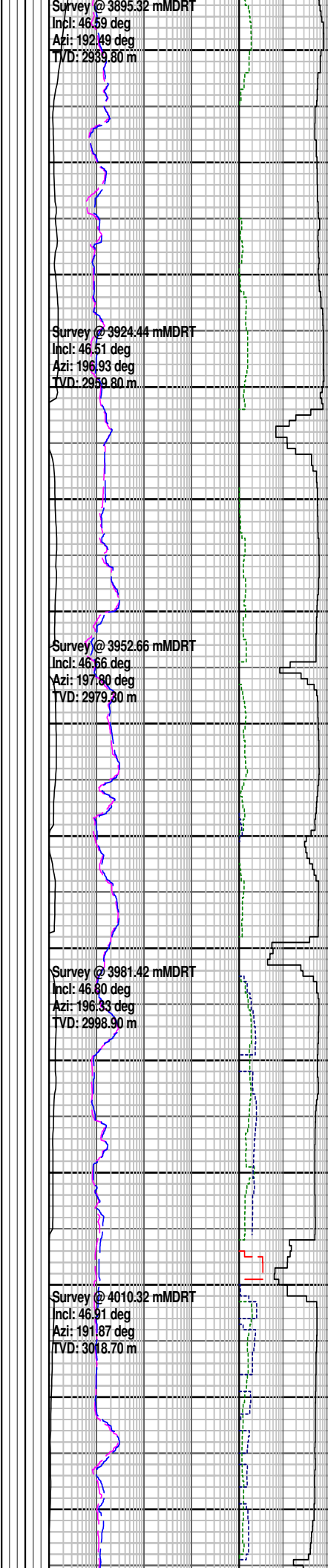
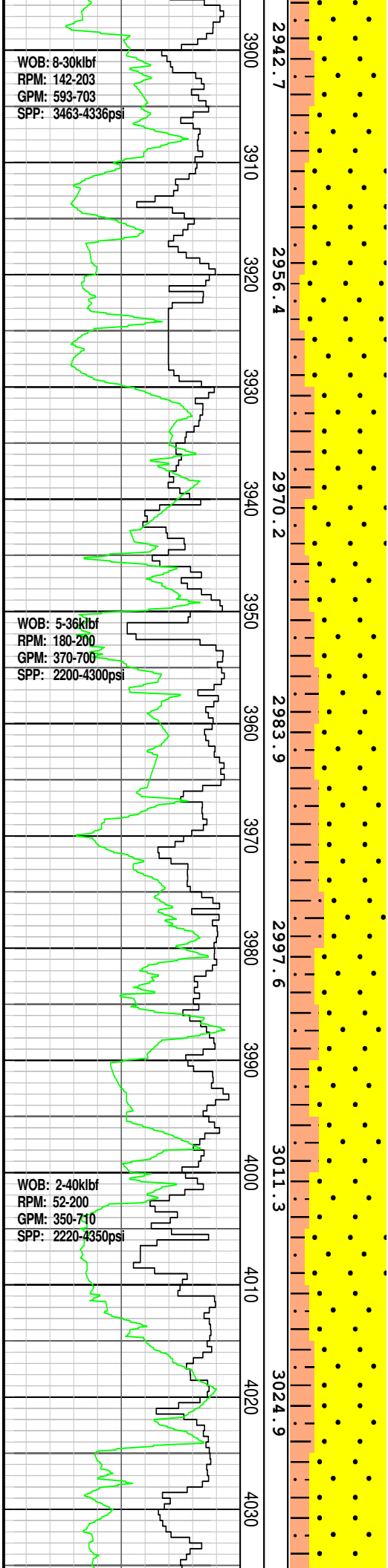
WOB: 9-45klbf
RPM: 176-203
GPM: 671-701
SPP: 4041-4295psi

Survey @ 3808.75 mMDRT
Incl: 47.06 deg
Azi: 192.56 deg
TVD: 2880.40 m

Survey @ 3837.28 mMDRT
Incl: 46.64 deg
Azi: 191.76 deg
TVD: 2899.90 m

Test Gas line OK

Survey @ 3866.96 mMDRT
Incl: 46.69 deg
Azi: 191.31 deg
TVD: 2920.30 m



SILTSTONE: olv gy-dk olv gy, med gy, gysh brn, non calc, tr v f aren, tr-com micmic, tr disse pyr, tr nod pyr, frm, dom sbfiss-sbblky

SANDSTONE: clr-trnsl, tr v lt gy, tr fros, v f-v crs, com v f-f, com v crs, p srt, ang-dom sbang, r sbrnnd, dom sbrnnd, wk sil cmt, wk pyr cmt tr pyr nod, cln, lse, p-fr inf por, no hydc fluor

SILTSTONE: olv gy-dk olv gy, med gy, gysh brn, non calc, tr v f aren, tr-com micmic, tr disse pyr, sft-dom frm, dom sbfiss-sbblky

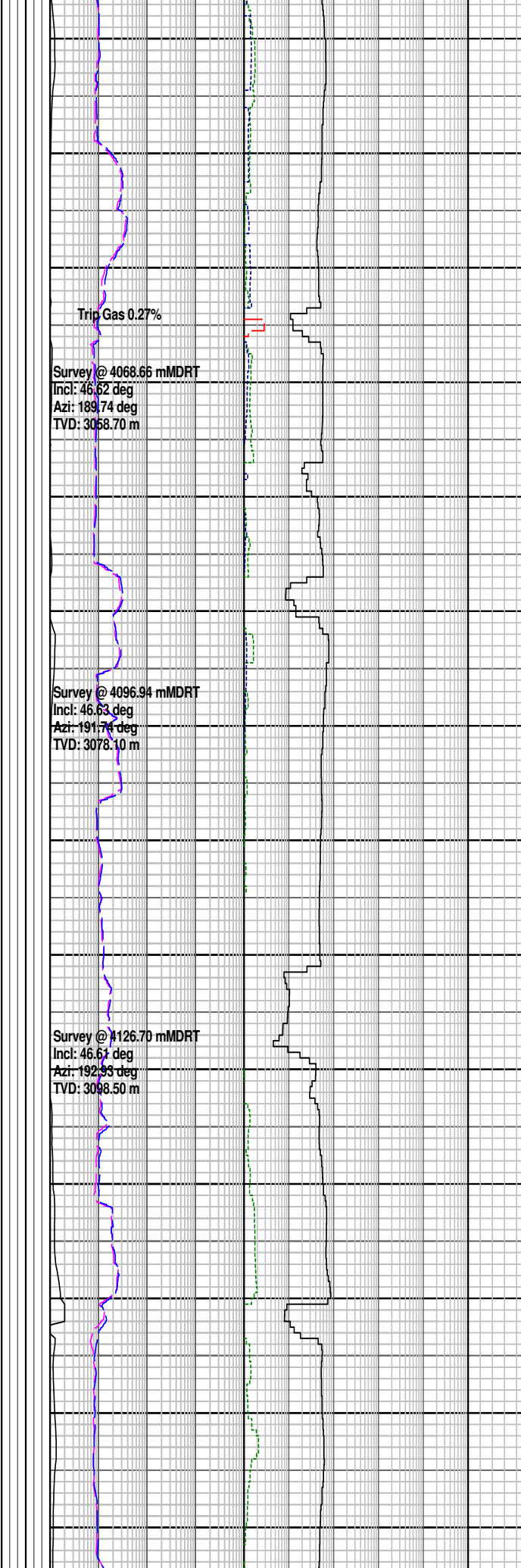
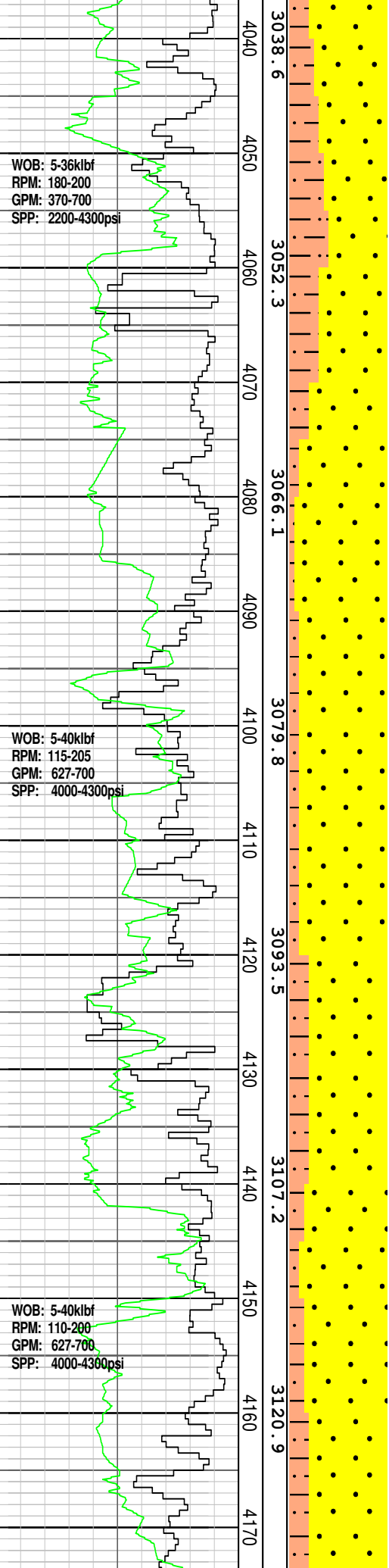
SANDSTONE: clr-trnsl, tr v lt gy, tr fros, med-v crs, com v f-f, com v crs, mod srt, ang-dom sbang, r sbrnnd, dom sbrnnd, wk sil cmt, wk pyr cmt, tr pyr nod, cln, lse, p-fr inf por, no hydc fluor

SILTSTONE: olv gy-dk olv gy, med gy, gysh brn, non calc, tr v f aren, tr-com micmic, tr disse pyr, sft-dom frm, dom sbfiss-sbblky

SANDSTONE: clr-trnsl, tr v lt gy, tr fros, med-v crs, r med, com v crs, mod srt, ang-dom sbang, r sbrnnd, dom sbrnnd, wk sil cmt, wk pyr cmt, tr pyr nod, cln, lse, p-fr inf por, no hydc fluor

SILTSTONE: olv gy-dk olv gy, med gy, gysh brn, non calc, tr v f aren, tr-com micmic, tr disse pyr, sft-dom frm, dom sbfiss-sbblky

SANDSTONE: clr-trnsl, com pl yelsh gy, tr fros, f-v crs, com f, com v crs, p srt



ang-dom sbang, r sbrndd, dom sbrndd, wk sil cmt, wk pyr cmt, tr pyr nod, cln, lse, p-fr inf por, no hydc fluor

SILTSTONE: olv gy-dk gnsh gy, med dk gy, non calc, tr v f aren, tr-com micmic, tr dissep pyr, tr v f glauc grs, sft-dom frm, dom sbfiss-sbbllky

SANDSTONE: clr-trnsl, com pl yelsh gy-pl yelsh or, tr fros, med-v crs, dom crs-v crs, mod srt, ang-dom sbang, r sbrndd, dom sbrndd, wk sil cmt, wk pyr cmt, cln, lse, p-fr inf por, no hydc fluor

SILTSTONE: olv gy-dk gnsh gy, med dk gy, non calc, tr v f aren, tr-com micmic, tr dissep pyr, tr v f glauc grs, sft-dom frm, dom sbfiss-sbbllky

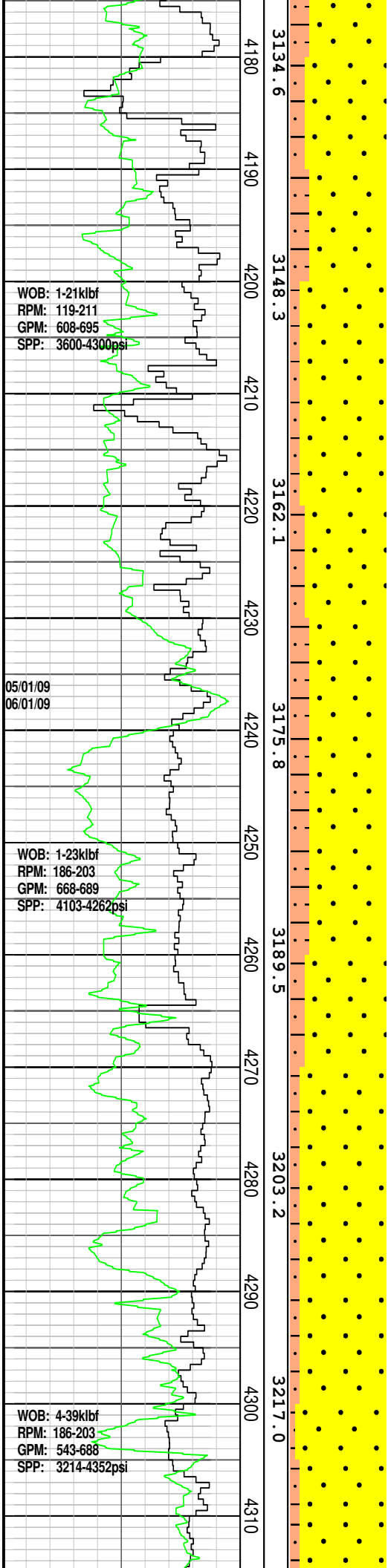
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SILTSTONE: olv gy-dk gnsh gy, med dk gy, non calc, tr v f aren, tr-com micmic, tr dissep pyr, tr v f glauc grs, sft-dom frm, dom sbfiss-sbbllky

SANDSTONE: clr-trnsl, r pl yelsh gy-pl yelsh or, tr fros, med-v crs, dom crs-v crs, mod srt, ang-dom sbang, r sbrndd, wk sil cmt, wk pyr cmt, cln, lse, p-fr inf por, no hydc fluor

SANDSTONE: clr-trnsl, r pl yelsh gy-pl yelsh or, tr fros, med-v crs, dom crs-v crs, mod srt, ang-dom sbang, r sbrndd, wk sil cmt, wk pyr cmt, tr nod pyr, cln, lse, p-fr inf por, no hydc fluor

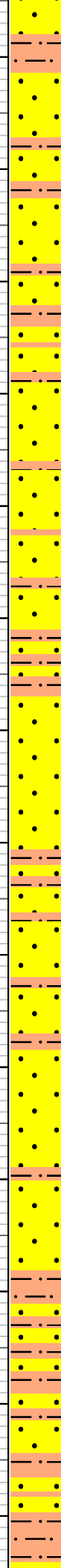
SILTSTONE: olv gy-dk gnsh gy, med dk gy, non calc, tr v f aren, tr-com micmic, tr



Survey @ 4183.93 mMDRT
 Incl: 46.78 deg
 Azi: 191.20 deg
 TVD: 3137.80 m

Survey @ 4241.84 mMDRT
 Incl: 46.79 deg
 Azi: 183.00 deg
 TVD: 3177.50 m

Survey @ 4270.08 mMDRT
 Incl: 46.59 deg
 Azi: 179.28 deg
 TVD: 3196.90 m



aren, tr-com micmic, tr
 disse pyr, tr v f glauc grs,
 sft-dom frm, dom
 sbfiss-sbblky

SANDSTONE: clr-trnsl, r pl
 yelsh gy-pl yelsh or, tr fros,
 f-v crs, dom crs-v crs, tr f, p
 srt, ang-dom sbang, r sbrndd,
 wk sil cmt, wk pyr
 cmt, tr nod pyr, cln, lse, p-fr
 inf por, no hydc fluor

SILTSTONE: olv gy-dk gnsh
 gy, med dk gy, non calc, tr v f
 aren, tr-com micmic, tr
 disse pyr, tr v f glauc grs,
 sft-dom frm, dom
 sbfiss-sbblky

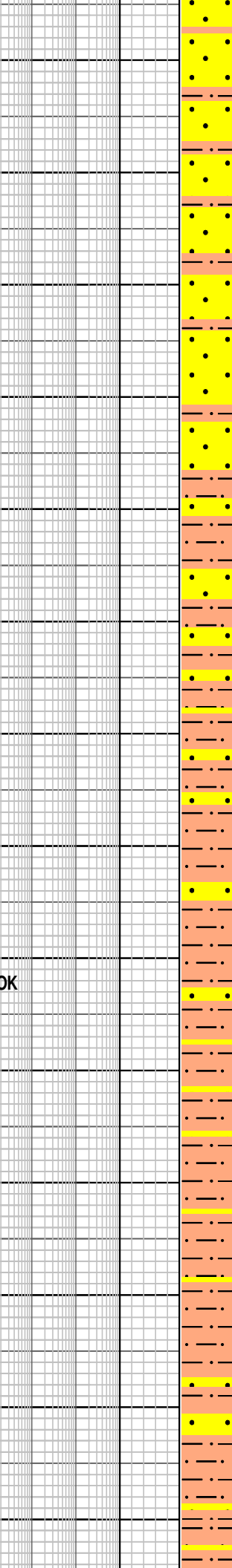
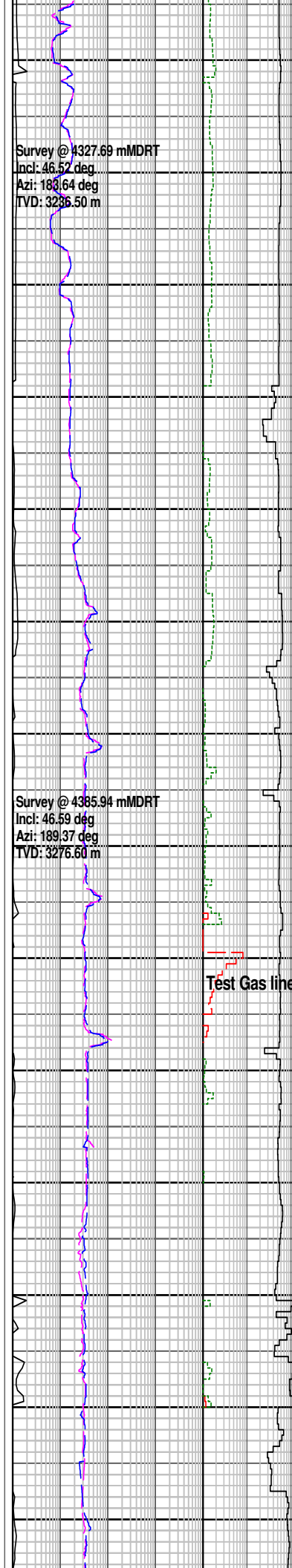
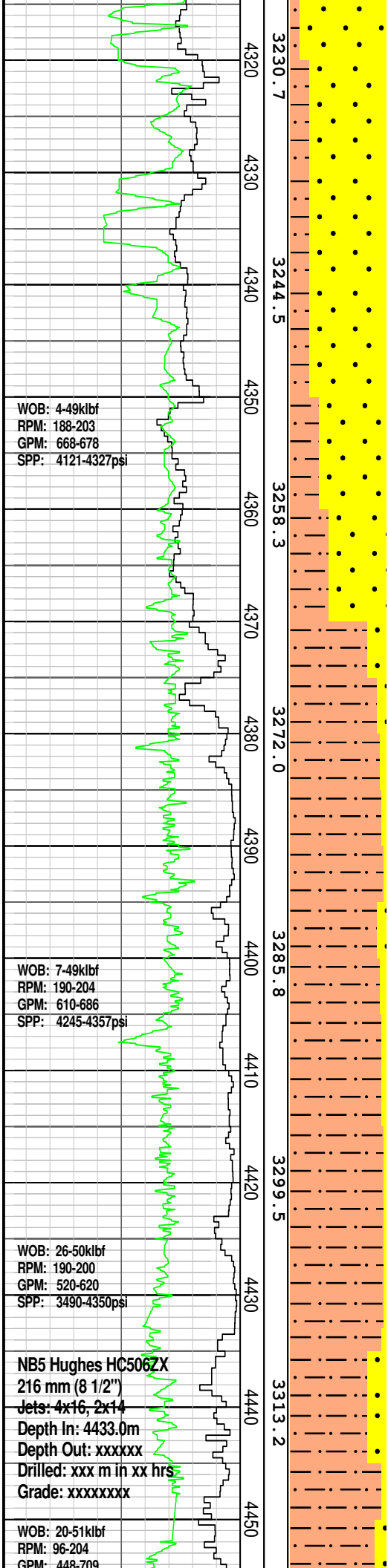
SANDSTONE: clr-trnsl, r pl
 yelsh gy-pl yelsh or, tr fros,
 f-v crs, dom crs-v crs, tr f, p
 srt, ang-dom sbang, r sbrndd,
 wk sil cmt, wk pyr cmt,
 tr nod pyr, cln, lse, p-fr inf
 por, no hydc fluor

SANDSTONE: clr-trnsl, r pl
 yelsh gy-pl yelsh or, tr fros,
 f-v crs, dom crs-v crs, tr f, p
 srt, ang-dom sbang, r sbrndd,
 wk sil cmt, wk pyr
 cmt, tr nod pyr, cln, lse, p-fr
 inf por, no hydc fluor

SANDSTONE: clr-trnsl, tr
 fros, f-v crs, com f, com v crs,
 tr f, p srt, ang-dom sbang, r
 sbrndd, wk sil cmt, wk pyr
 cmt, cln, lse, p-fr inf por, no
 hydc fluor

SANDSTONE: clr-trnsl, tr
 fros, f-v crs, min f, com v crs,
 p srt, ang-dom sbang, r
 sbrndd, wk sil cmt, wk pyr
 cmt, tr nod pyr, cln, lse, p-fr
 inf por, no hydc fluor

SILTSTONE: olv gy-dk gnsh
 gy, med dk gy, non calc, tr v f



aren, tr-mnr micmic, tr
dissem pyr, tr v f glauc grs,
sft-dom frm, dom
sbfiss-sbbly

SANDSTONE: clr-trnsl, tr
fros, med-v crs, dom crs-v
crs, tr f, mod srt, ang-dom
sbang, mnr sbrndd, wk sil
cmt, wk pyr cmt, cln, tr pyr
nod, lse, p-fr inf por, no hyd
flur

SANDSTONE: clr-trnsl, tr
fros, med-v crs, dom crs-v
crs, tr f, mod srt, ang-dom
sbang, mnr sbrndd, wk sil
cmt, wk pyr cmt, cln, r pyr
nod, lse, p-fr inf por, no hyd
flur

SILTSTONE: olv gy-dk gnsh
gy, med dk gy, non calc, tr v f
aren, tr-mnr micmic, tr v f
glauc grs, sft-dom frm, dom
sbfiss-sbbly

SILTSTONE: lt gy-med gy,
med dk gy-tr gy blk, non calc,
tr v f aren, tr-mnr micmic,
tr-com dissem pyr, tr-com pyr
nod, tr v f glauc, sft-dom frm,
dom sbfiss-sbbly

SILTSTONE: lt gy-med gy,
med dk gy-tr gy blk, non calc,
tr v f aren, tr-mnr micmic,
tr-com dissem pyr, tr-com pyr
nod, tr v f glauc, sft-dom frm,
dom sbfiss-sbbly

SILTSTONE: lt gy-med gy,
med dk gy-tr gy blk, non calc,
tr v f aren, tr-mnr micmic,
tr-com dissem pyr, tr-com pyr
nod, tr v f glauc, sft-dom frm,
dom sbfiss-sbbly

SANDSTONE: clr-trnsl, tr
fros, med-v crs, dom crs-v
crs, tr f, mod srt, ang-dom
sbang, mnr sbrndd, wk sil
cmt, wk pyr cmt, cln, r pyr
nod, lse, p-fr inf por, no hyd
flur

POOH @ 4433.0 mMDRT to pick up
drill pipe & change Bit

SILTSTONE: lt gy-med gy,
med dk gy-tr gy blk, com dsk
brn, non calc, tr v f aren,
tr-mnr micmic, tr-com dissem
pyr, tr-com pyr nod, tr v f
glauc, sft-dom frm, dom
sbfiss-sbbly

SPP: 2616-4633psi

WOB: 20-52klbf
RPM: 145-204
GPM: 500-780
SPP: 3000-4300psi

WOB: 6-52klbf
RPM: 190-204
GPM: 566-662
SPP: 3204-4341psi

3327.0
3340.7
3354.5
3368.2
3381.9
3395.6
3409.3

Survey @ 4506.38 mMDRT
Incl: 46.56 deg
Azi: 190.59 deg
TVD: 3358.80 m

Survey @ 4535.61 mMDRT
Incl: 46.83 deg
Azi: 191.23 deg
TVD: 3318.90 m

Survey @ 4564.35 mMDRT
Incl: 46.69 deg
Azi: 191.09 deg
TVD: 3398.60 m

SILTSTONE: lt gy-med gy, med dk gy-gy blk gy, com dsky brn, non calc, tr v f aren, tr-mnr micmic, tr dissem pyr, tr pyr nod, tr v f glauc, sft-dom frm, r mod hd, disp, sbfiss-sbblky, amor i/p

SANDSTONE: 1:3% clr-trnsl, tr v lt gy, dom v f-f, wl srt, dom sbrndd-sbang, v f-f grs, occ w/ v disp lt gy argl mtrx that is washed out, p-fr inf por, no hydc fluor

SANDSTONE: 2:3% (possible cavings), clr-trnsl, tr v lt gy, crs-v crs, wl srt, dom sbang-sbrndd, wl sil cmt & wk pyr cmt on crs grs, tr nod pyr, dom cln, lse, p-fr inf por, no hydc fluor

SILTSTONE: med lt gy-gy blk, tr brnsh blk, tr gnsh gy, non calc, tr v f aren, tr-mnr micmic, tr dissem pyr, tr pyr nod, tr v f glauc, sft-dom frm, sbfiss-sbblky, amor i/p

SILTSTONE: med lt gy-gy blk, tr brnsh blk, tr gnsh gy, non calc, tr v f aren, tr-mnr micmic, tr dissem pyr, tr pyr nod, tr v f glauc, sft-dom frm, r mod hd, disp, sbfiss-sbblky, amor i/p

SILTSTONE: med lt gy-gy blk, tr brnsh blk, tr gnsh gy, non calc, tr v f aren, tr-mnr micmic, tr dissem pyr, tr pyr nod, tr v f glauc, sft-dom frm, r mod hd, disp, sbfiss-sbblky, amor i/p

SILTSTONE: med lt gy-gy blk, tr brnsh blk, tr dk gnsh gy, non calc, tr-r v f aren, tr-mnr micmic, tr nod&dissem pyr, tr v f glauc, sft-dom frm, r mod hd, amor-sbblky, sbfiss i/p

