



GEOSEARCH LOGGING INC.

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

Well Name: Zogol A 2H
 Location: Marion Co, WV
 License Number: 47-049-02146
 Spud Date: 3/27/2011
 Surface Coordinates: Lat: 39.4858206
 Long: -80.3492718
 Bottom Hole Coordinates: Lat: 39.486022
 Long: -80.338711
 Ground Elevation (ft): 1,233' K.B. Elevation (ft): 1,249'
 Logged Interval (ft): 2,991' To: 10,477' Total Depth (ft): 10,477'
 Formation: Marcellus
 Type of Drilling Fluid: Air drilling, Minerl oil based

Region: APPALACHIA
 Drilling Completed: 4/10/2011

Printed by MUD.LOG from WellSight Systems 1-800-447-1534 www.WellSight.com

OPERATOR

Company: XTO ENERGY
 Address: 810 Houston St.,
 Suite 2000
 Forth Worth, TX 76102-6298


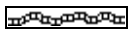
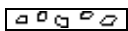
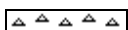
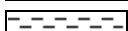


GEOLOGIST






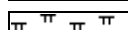

Name: Kelley Hartley, Gilbert Arnold, Derwin Cromer
 Company: Geosearch Logging, Inc.
 Address: P.O. Box 6005
 Edmond, OK 73083-6005
 (405) 340-5545

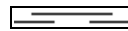
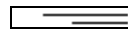
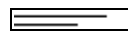

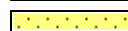
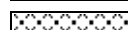
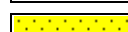
Comments


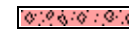



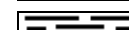
2 Manned Logging Service
 Start Logging Date: 3/31/2011
 OBM on : 4/5/2011
 Released Logging Date: 4/10/2011
 Drilling Contractor: UDI#209
 PC 194,ML 334, I-Ball 184,HASP: V15

ROCK TYPES

 Anhy
 Bent
 Brec
 Cht
 Clyst
 Coal
 Congl

 Dol
 Gyp
 Igne
 Lmst
 Meta
 Mrlst
 Salt

 Shale
 Shcol
 Shgy
 Sltst
 Ss
 Till
 Sandstn

 Siltstn
 Granwash
 Dolowash
 Cement
 Granite
 Hotshale

ACCESSORIES

MINERAL

- Anhy
- Arggrn
- Arg
- Bent
- Bit
- Brefracg
- 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

- 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
- Poor
- Fair
- Good
- Excelent
- Csgshoe

INTERVALS

- Core
- Dst

EVENTS

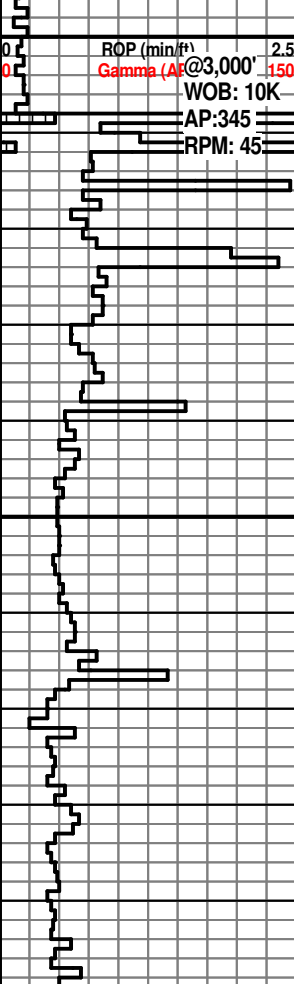
- Rft
- Sidewall

Curve Track 1 ROP (min/ft) _____ Gamma (API) _____	Depth	% Lithology	Porosity	Lithology	Oil Shows	Geological Descriptions	TG (units) C1 (ppm) _____ C2 (ppm) _____
<p>ROP (min/ft) 2.5</p> <p>All Depths Correspond with Drilliers Pipe Tally</p>	29		24% 18% 12% 8%			<p>XTO ENERGY</p> <p>ZOGOL A 2H</p> <p>9 5/8" Casing set at 2,992' md</p> <p>2 person logging commenced on 3/31/2011</p> <p>Starting Formation: Speechley</p> <p>Formation samples @ 3,000' MD with 30' spot samples</p>	<p>Loggers Key: KAH= Kelley Hartley GKA = Gilbert Arnold JDC = Derwin Cromer</p> <p>TG (units) C1 (ppm) C2 (ppm)</p> <p>Logger systems used to analyse gas while air drilling I-Ball system used to analyse gas while drilling on mud</p>

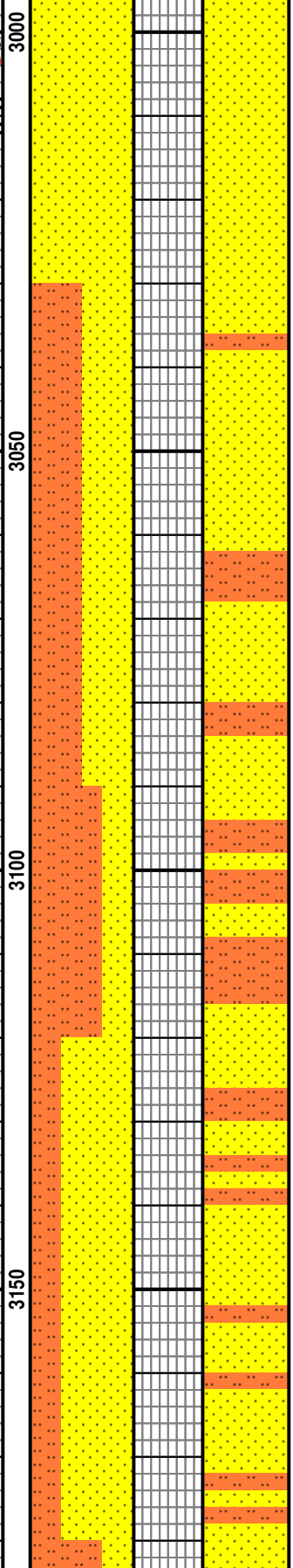
NB#4. Smith Tri-cone
 @2,992' md, Type: F47YA,
 Ser# PS6520

4/2/11@2,992'

ROP (min/ft) 2.5
 Gamma (API) @3,000' 150
 WOB: 10K
 AP: 345
 RPM: 45



@3,100'
 WOB: 11K
 AP: 345
 RPM: 45



SS: lt-mgy, occ brn-tan, vf-m gr, mod srt, sbrd-sbang, gr supp, w cons, no vis por

SS: lt-mgy, occ brn-tan, vf-m gr, mod srt, sbrd-sbang, gr supp, w cons, no vis por

SLTST: mgy, dll lstr, sm txt, sbbkly, non calc, w/ SS: lt-mgy, occ brn-tan, vf-m gr, mod srt, sbrd-sbang, gr supp, w cons, no vis por

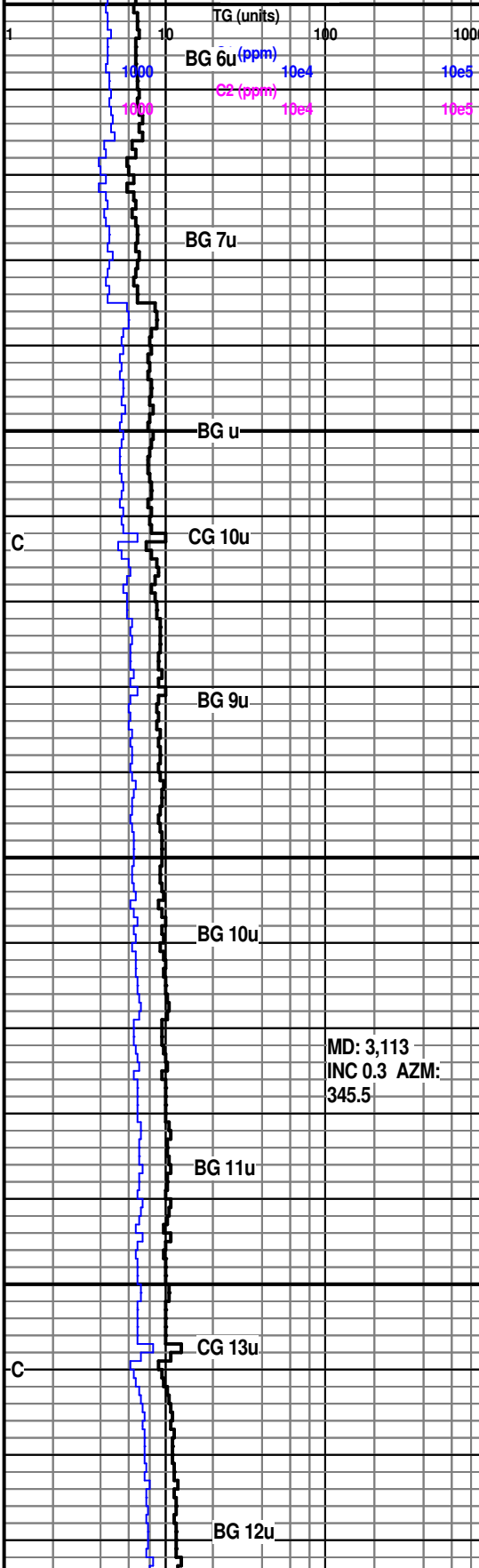
SLTST: mgy, dll lstr, sm txt, sbbkly, non calc, w/ SS: lt-mgy, occ brn-tan, vf-m gr, mod srt, sbrd-sbang, gr supp, w cons, no vis por

SS: lt-mgy, occ brn-tan, vf-m gr, mod srt, sbrd-sbang, gr supp, w cons, no vis por /w SLTST: mgy, dll lstr, sm txt, sbbkly, non calc,

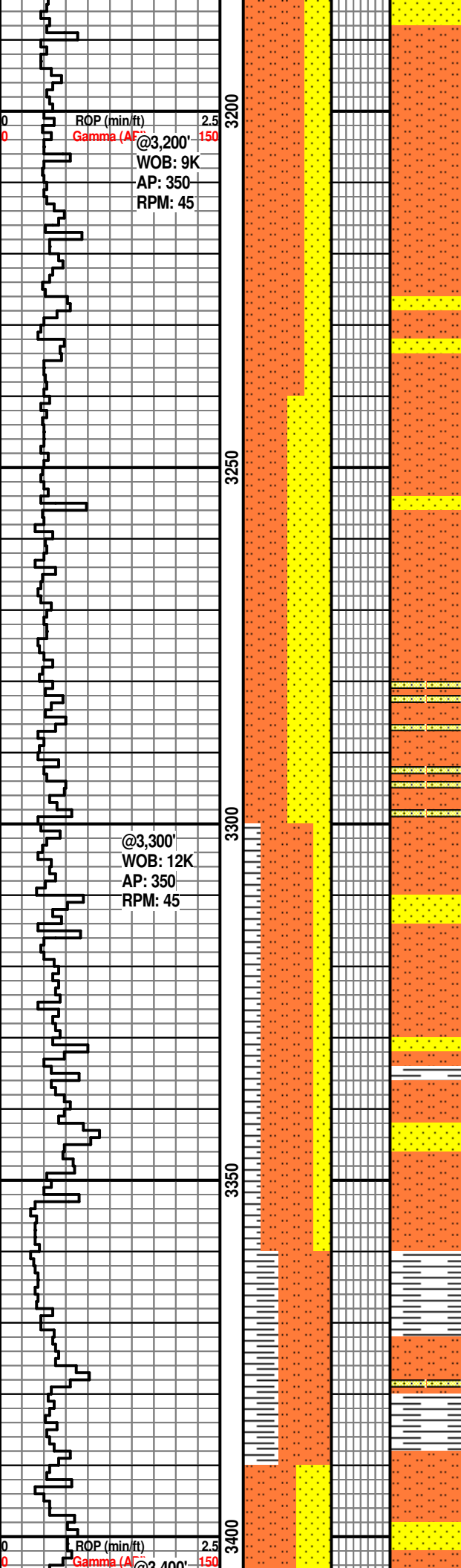
SS: lt-mgy, occ brn-tan, vf-m gr, mod srt, sbrd-sbang, gr supp, w cons, no vis por /w SLTST: mgy, dll lstr, sm txt, sbbkly, non calc,

GKA@2,992' MD

AIR DRILLING



MD: 3,113
 INC 0.3 AZM:
 345.5



SLTST: mgy sme ltgy, dll lstr, sm txt, sbblky, frm-hd, mod ind, non calc, w/ SS: mgy, vf-m gr, sbrd-rd, w srt, w cons, no vis por

SLTST: mgy sme ltgy, dll lstr, sm txt, sbblky, frm-hd, mod ind, non calc, w/ SS: mgy, vf-m gr, w srt, sbrd-rd, w cons, no vis por

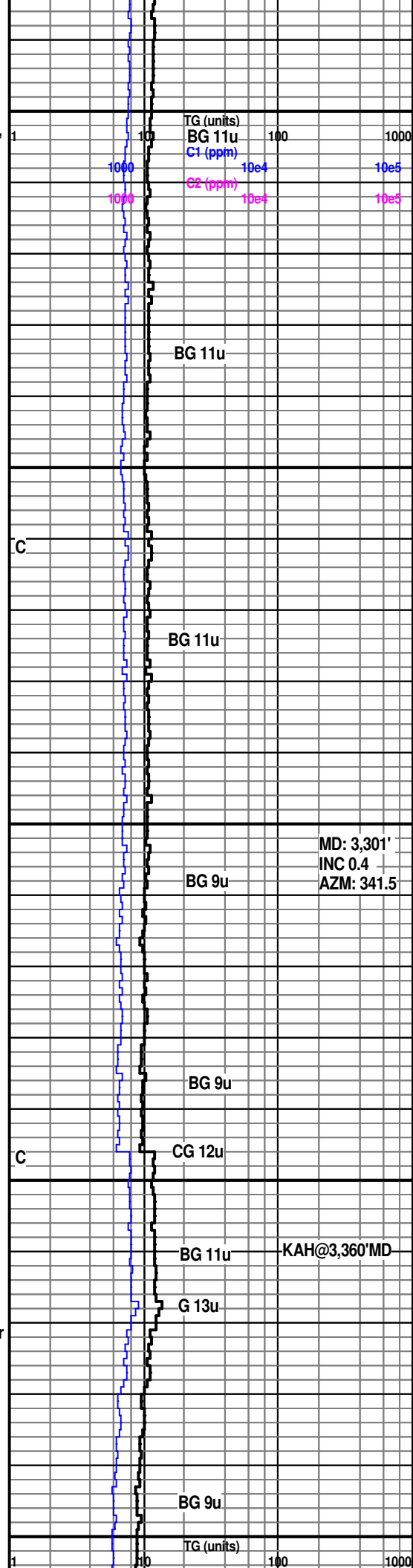
SLTST: mgy sme ltgy, dll lstr, sm txt, sbblky, frm-hd, mod ind, non calc, w/ SS: mgy, vf-m gr, w srt, sbrd-rd, w cons, no vis por

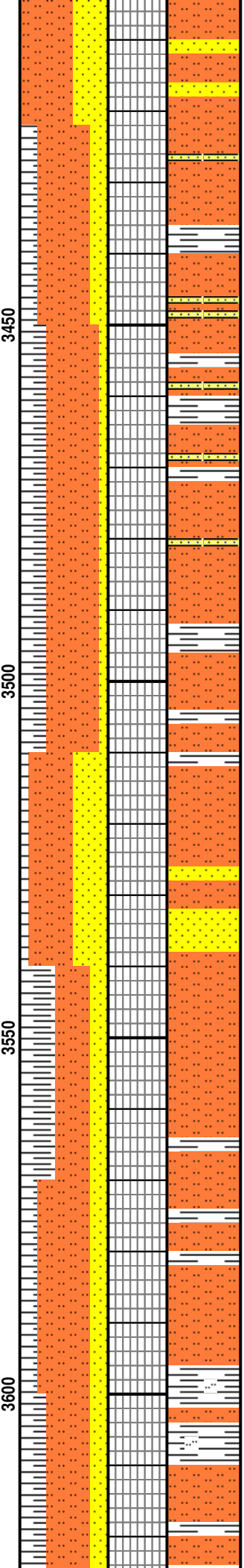
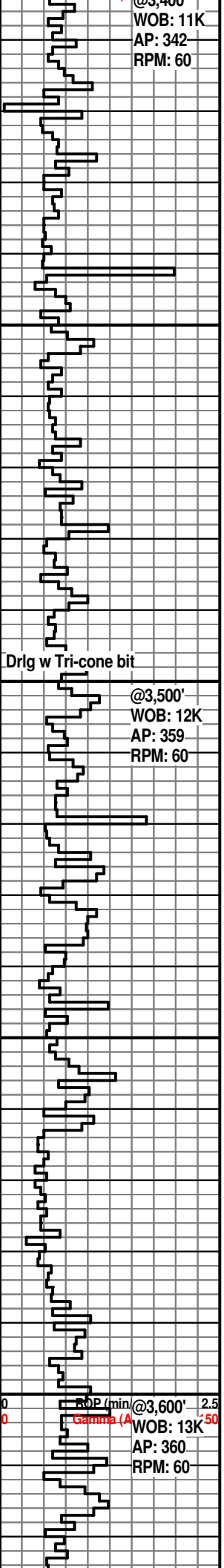
SLTST: mgy sme ltgy, dll lstr, sm txt, sbblky, frm-hd, mod ind, non calc, w/ SS: mgy, vf-m gr, w srt, sbrd-rd, w cons, no vis por

SLTST: m gy, ltgy ip, dll lstr, sm txt, sbblky, frm-hd, mod ind, n calc, w/ SS: mgy, vf-m gr, w srt, sbrd-rd, w cons; SH: ltgy -gy, frm-sl hd, tr hd, pty-blky, amorph ip, n calc, tr fn pyr

SLTST: m gy, ltgy ip, dll lstr, sm txt, sbblky, frm-hd, mod ind, n calc, tr fn pyr, rr calc xls; SH: ltgy -gy, frm-sl hd, tr hd, pty-blky, amorph ip, n calc, tr fn pyr; tr SS

SLTST: m - ltgy, dll lstr, sm txt, sbblky, frm-hd, mod ind, n calc, w/ SS: mgy





mf-hd, mod ind, sl calc, w/ SS: mgy, vf-m gr, w srt, sbrd-rd, w cons, calc cmt

SLTST: m - ltgy, dll lstr, sm txt, sbblky, frm-hd, mod ind, sl calc, w/ SS: mgy, vf-m gr, w srt, sbrd-rd, w cons, calc cmt; SH: ltgy-gy, frm-sl hd, tr hd, plty-blky, amorph ip, n calc, tr fn pyr;

SLTST: rdbrn ip, m gy ip, dll lstr, sm txt, amorph-blky, hd, mod ind-ind, sl calc; SH: ltgy, frm-sl hd, tr hd, plty-blky, amorph ip, n calc, tr fn pyr; tr SS: vry lt gy-why, vf-m gr, m-w srt, p srt ip, sbrd-rd, m-w cons, calc cmt ip, silc cmt ip

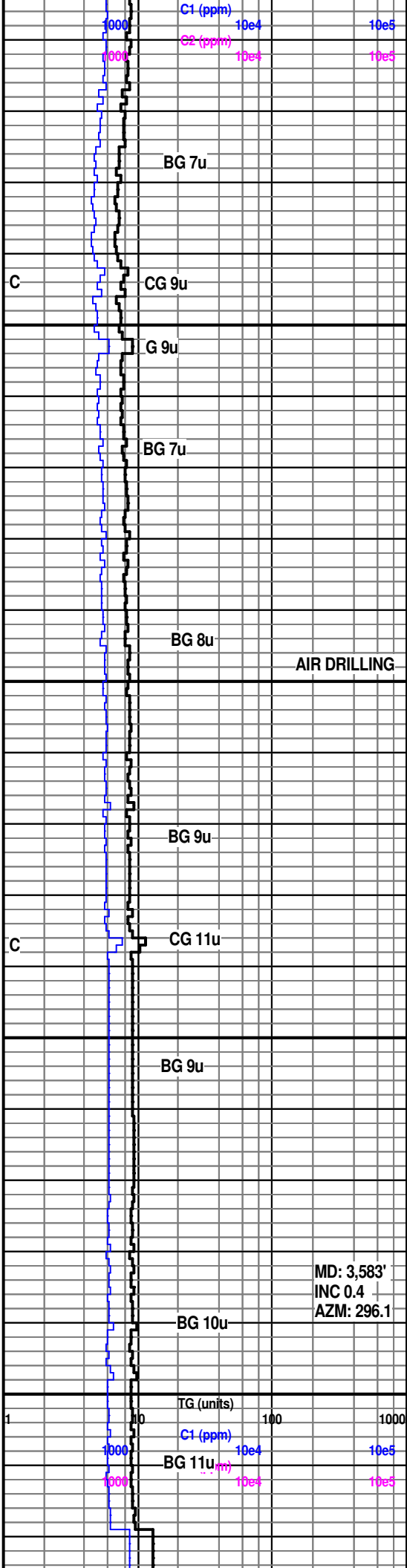
SLTST: rdbrn-lt gy, tr m gy, sm txt, amorph, hd, mod ind-ind, sl calc, rr calc, tr fn pyr, micmica; SH: ltgy, frm-sl hd, tr hd, plty-blky, amorph ip, n calc, micmica ip; SS: vry lt gy-why, vf-m gr, m-w srt, p srt ip, sbrd-rd, m-w cons, calc cmt, fd pyr/micmica ip

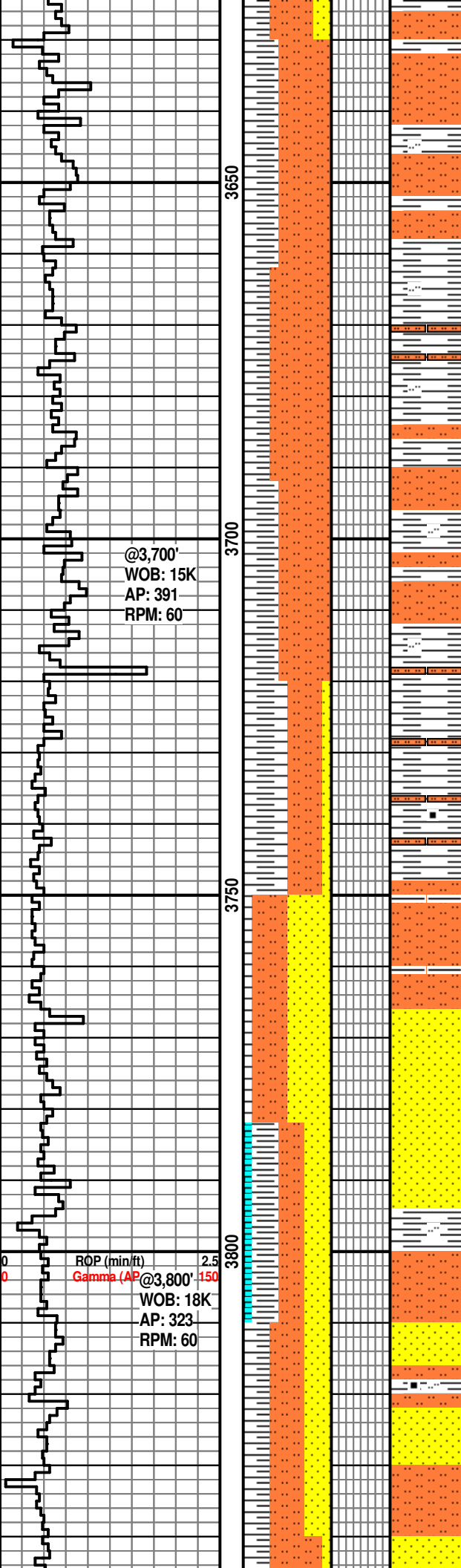
SLTST: rdbrn, grngy, sm txt, amorph, frm-hd, mod ind, sl calc, micmica; SS: wht, ltgy ip, vf-m gr, m-w srt, sbrd-rd, m-w cons, calc cmt, micmica ip; SH: ltgy, frm-sl hd, tr hd, plty-blky, amorph ip, n calc, micmica ip

SLTST: gy, sm txt, amorph, frm, mod ind, n calc; SH: ltgy, frm-sl hd, plty-blky, amorph ip, n calc, slty ip; SS: wht, vf-m gr, m-w srt, sbrd-rd, m-w cons, calc cmt

SLTST: gy, sm txt, amorph, frm, mod ind, sl calc, calc ip; SH: ltgy, frm-sl hd, plty-blky, amorph ip, n-sl calc, slty ip; SS: wht, vf-m gr, m-w srt, sbrd-rd, m-w cons, calc cmt

SLTST: gy rdbrn ip, sm txt, amorph, frm, mod ind, sl calc, calc ip; SH: lt - m gy, frm-sl hd, plty-blky, amorph ip, n-sl calc, slty ip; SS: wht, vf-m gr, m-w srt, sbrd-rd, m-w cons, calc cmt





SLTST: lt rdbrn iup, gy ip, amorph-blky, micmica, fn pyr ip, sl calc, tr calc; SH: gy, frm, n calc, tr sl calc, blky- pty, amorph, slty ip grdng to sltst ip, micmica

SLTST: gy ip, rd brn ip, amorph-blky, micmica, fn pyr ip, sl calc, tr calc; SH: gy, frm, n calc, tr sl calc, blky- pty, amorph, slty ip grdng to sltst ip, micmica

SLTST: lt-m gy, tr rd brn, slit-vf snd gr in it-m gr mtx, grd to slty sh ip, amorph-blky, micmica, fn pyr ip, sl calc, tr calc; SH: gy, frm, n calc, tr sl calc, blky- pty, amorph, slty ip grdng to sltst ip, micmica

SH: lt- m gy, f- m tex, sl hd, n calc, blky- pty, slty ip grdng to sltst, micmica, vf carb inc; SLTST: lt-m gy, slit-vf snd gr in it-m gr mtx, grd to slty sh ip, amorph-blky, micmica, fn pyr ip, sl calc, tr calc; SS ip

SS: wht, ltgy ip, vf-m gr, m-w srt, sbrd-rd, m-w cons, calc cmt, micmica ip; SLTST: gy, sm txt, amorph, frm, mod ind, sl calc, calc ip; tr SH

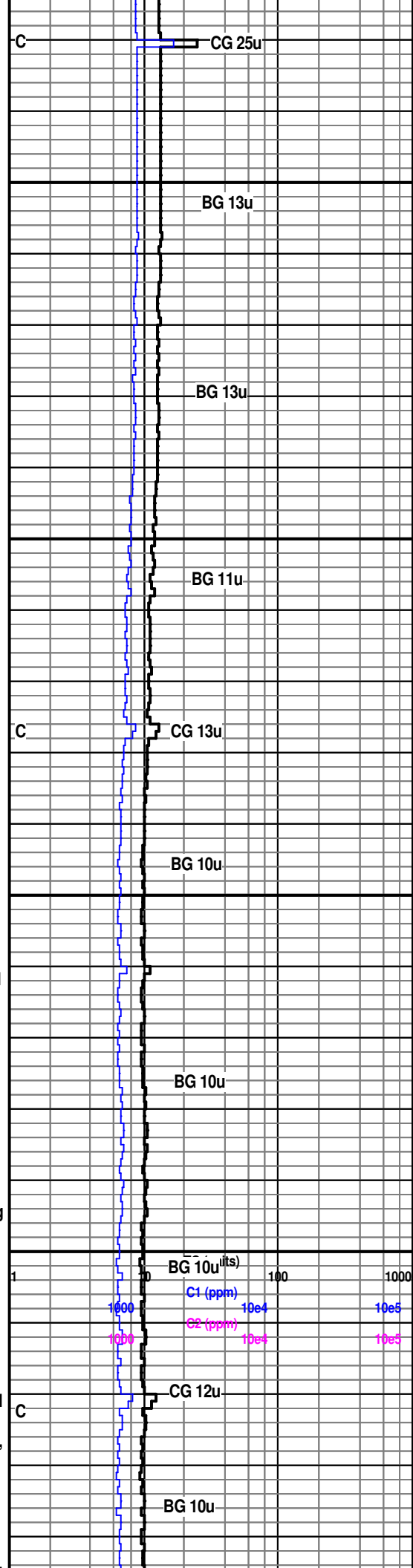
Upper Balltown Sands @ 3,780'

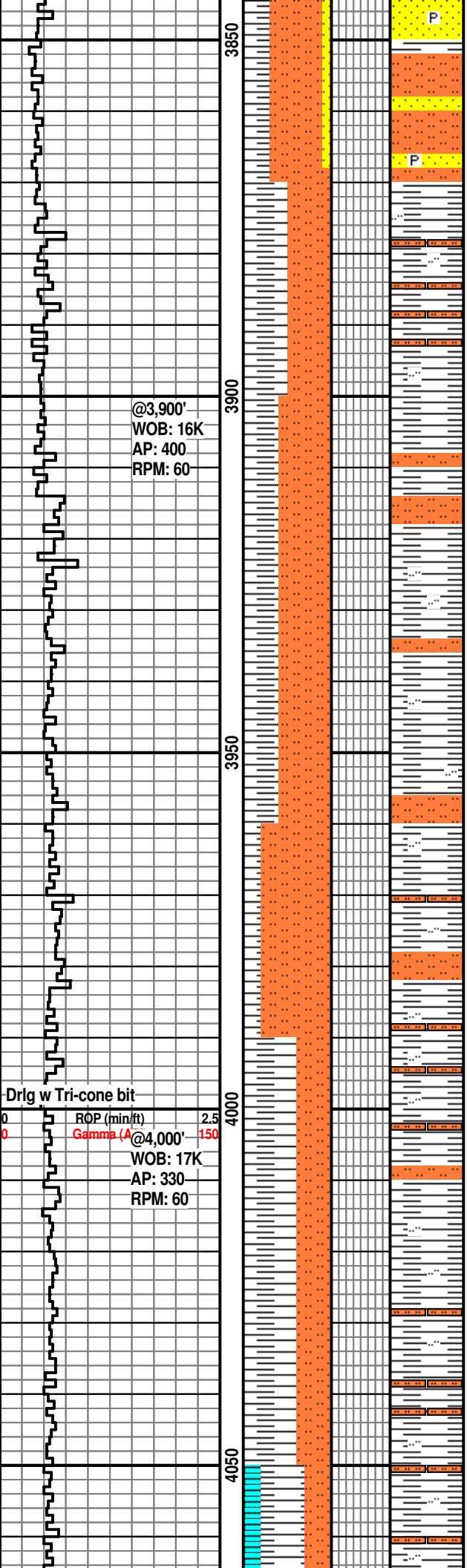
SS: lt- m gy- gy grn, slit- vf, grdtnl w/ sltst, w srt, sbang, sl hd, calc cmt, micmica, vf carb inc; LS: buff, mdst, crpxln, mass; SH: lt- m gy, m gy ip, f- m tex, sl hd, n calc, blky- pty, slty ip grdng to sltst, micmica, vf carb inc

Balltown Sands @ 3,810'

SS: lt- m gy, wht ip, slit- vf gr, grdtnl w/ sltst, w srt, sbang, sl hd, sl- m calc, micmica, vf carb incl & strks, tr pyritized carb strk; SH: m dk gy, f- m tex, slty ip, grdtnl w/ sltst ip, sl hd, n calc, blky- pty, micmica, vf carb incl

SS: lt- m gy, wht ip, slit- vf gr, grdtnl w/ sltst, w srt, sbang, sl hd, sl- m calc,





@3,900'
WOB: 16K
AP: 400
RPM: 60

Drlg w Tri-cone bit

ROP (min/ft) 2.5
Gamma (A) 150
@4,000'
WOB: 17K
AP: 330
RPM: 60

micmica, vf carb incl & strks, tr pyritized carb strk; SH: m dk gy, f- m tex, slty ip, grdtl w/ sltst ip, sl hd, n calc, blkly- ppty, micmica, vf carb incl

SH: lt- m gy, m gy ip, f- m tex, sl hd-frm, n calc, blkly- ppty, slty grdng to sltst, micmica; SLTST: lt-m gy, slt-vf snd gr in it-m gr mtx, grd to slty sh ip, amorph- blkly, micmica, fn pyr ip, sl calc, tr calc

SLTST: lt-m gy, slt-vf snd gr in it-m gr mtx ip, grd to slty sh ip, amorph- blkly, micmica, fn pyr ip, sl calc, tr calc; SH: lt- m gy, m gy ip, f- m tex, sl hd-frm, n calc, blkly- ppty, slty grdng to sltst, micmica

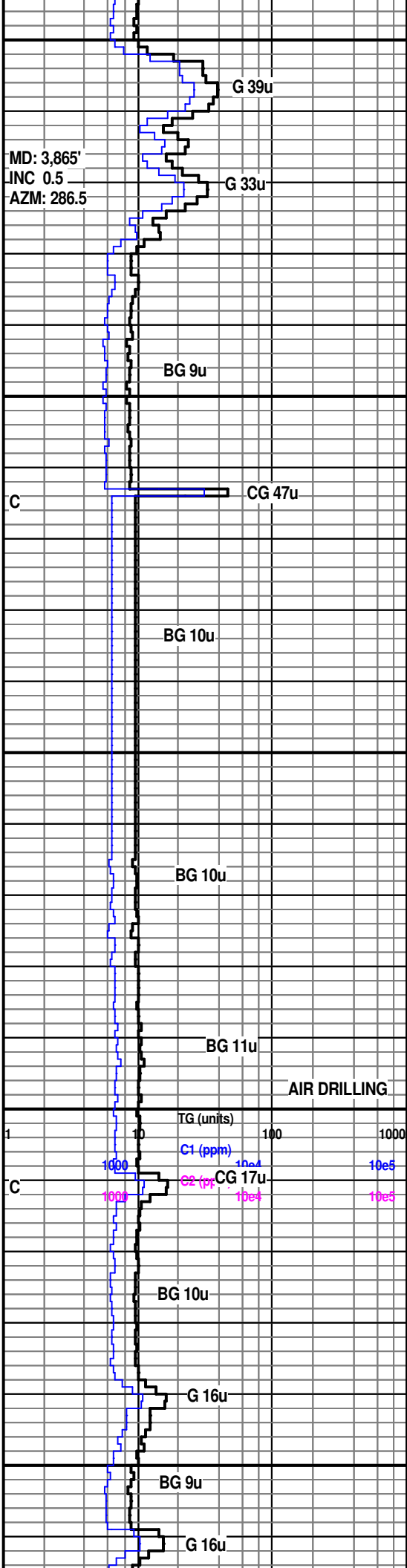
SLTST: lt-m gy, slt-vf snd gr in it-m gr mtx ip, grd to slty sh ip, amorph- blkly, micmica, fn pyr ip, sl calc, tr calc; SH: gy, f- m tex, sl hd-frm, n calc, blkly- ppty, slty grdng to sltst, micmica

SLTST: lt-m gy, slt-vf snd gr in it-m gr mtx ip, grd to slty sh ip, amorph - blkly, micmica, fn pyr ip, sl calc, tr calc; SH: gy, f- m tex, sl hd-frm, n calc, blkly- ppty, slty grdng to sltst, micmica

SH: gy, f- m tex, sl hd-frm, n calc, blkly- ppty, slty grdng to sltst, micmica; SLTST: lt-m gy, slt-vf snd gr in it-m gr mtx ip, grd to slty sh ip, amorph - blkly, micmica, fn pyr ip, sl calc, tr calc;

SH: gy-ltgy, f- m tex, sl hd-frm, n calc, blkly- ppty, slty grdng to sltst, micmica; SLTST: lt-m gy, grd to slty sh ip, amorph-blky, micmica, fn pyr ip, sl calc, tr calc

SH: gy-ltgy, f- m tex, sl hd-frm, n calc, blkly- ppty, slty grdng to sltst, micmica; SLTST: lt-m gy, grd to slty sh ip, amorph-blky, micmica, fn pyr ip, sl calc,



MD: 3,865'
INC 0.5
AZM: 286.5

G 39u

G 33u

BG 9u

CG 47u

BG 10u

BG 10u

BG 11u

AIR DRILLING

TG (units)

C1 (ppm)

C2 (ppm)

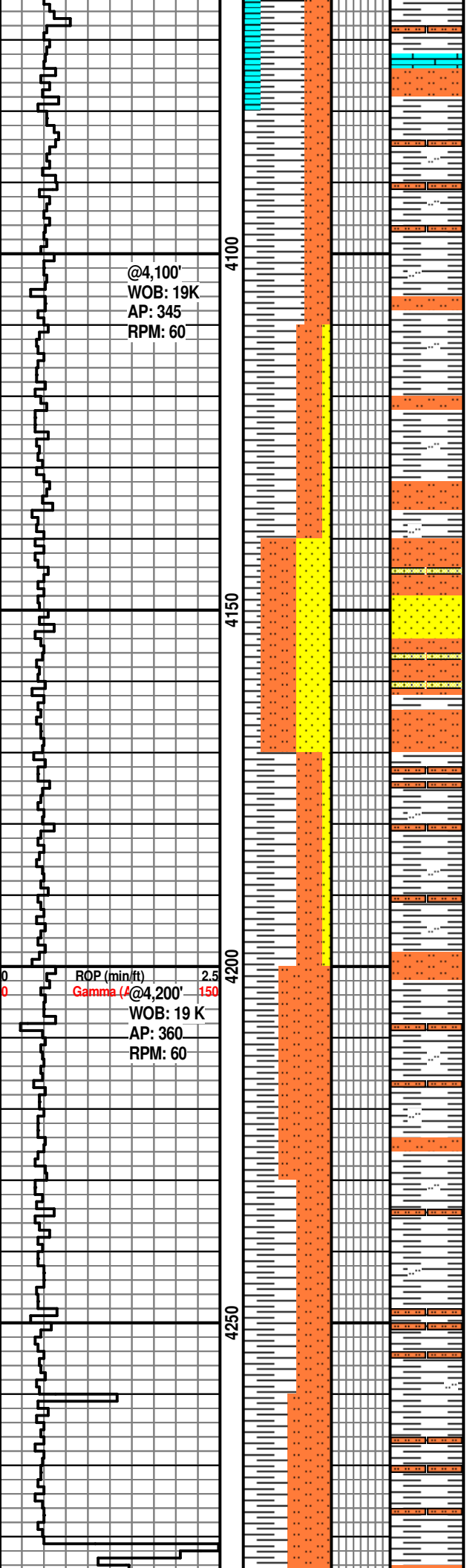
CG 17u

BG 10u

G 16u

BG 9u

G 16u



tr calc; LS: buff- lt gy, mdst- wkst, crpxln- vf xln, dns, arg ip, slty ip grdng to calc sltst, tr foss frag

SH: gy-m gy, tr rdbrn, f- m tex, frm, sl hd ip, n calc, blk- pty, slty grdng to sltst ip, micmica ip; SLTST: lt- m gy, grd to slty sh ip, amorph- blk, micmica, fn pyr ip, sl calc- calc

SH: gy- m gy, f- m tex, frm, sl hd ip, n calc, blk- pty, slty grdng to sltst ip, micmica ip; SLTST: lt- m gy, grd to slty sh ip, amorph- blk, micmica, fn pyr ip, sl calc- calc; SS: wht, vf- m gr, m- w srt, sbrd- rd, m- w cons, calc cmt

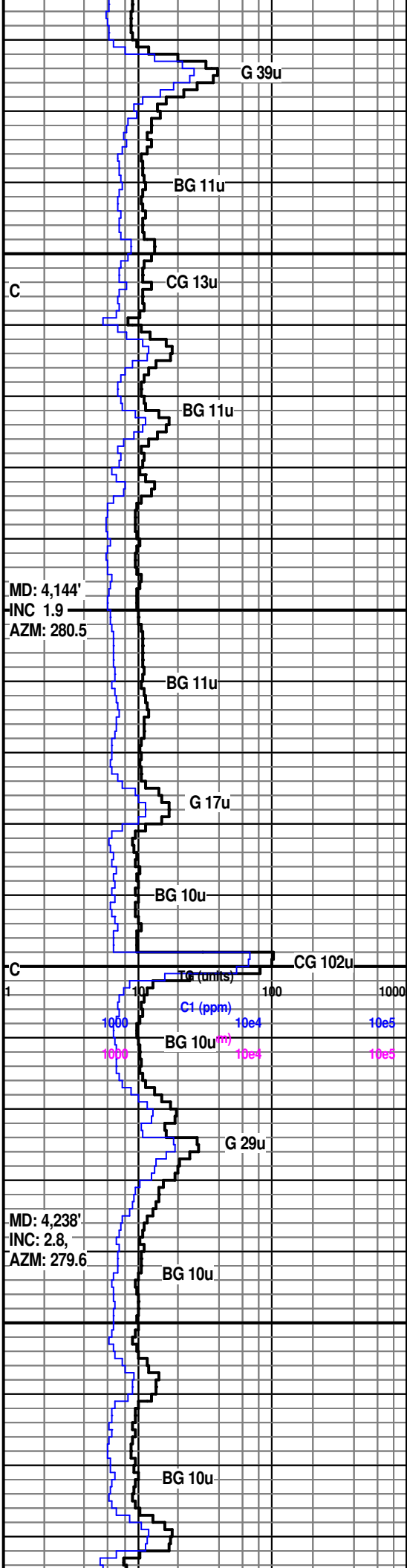
SS: ltgy- wht, slt- vf gr, grdtnl w/ sltst, w srt, sbang, sl hd, calc cmt, arg, vf carb incl ip; SLTST: lt gy, sl hd, blk, n- sl calc, arg grdng to slty sh ip, vf carb incl

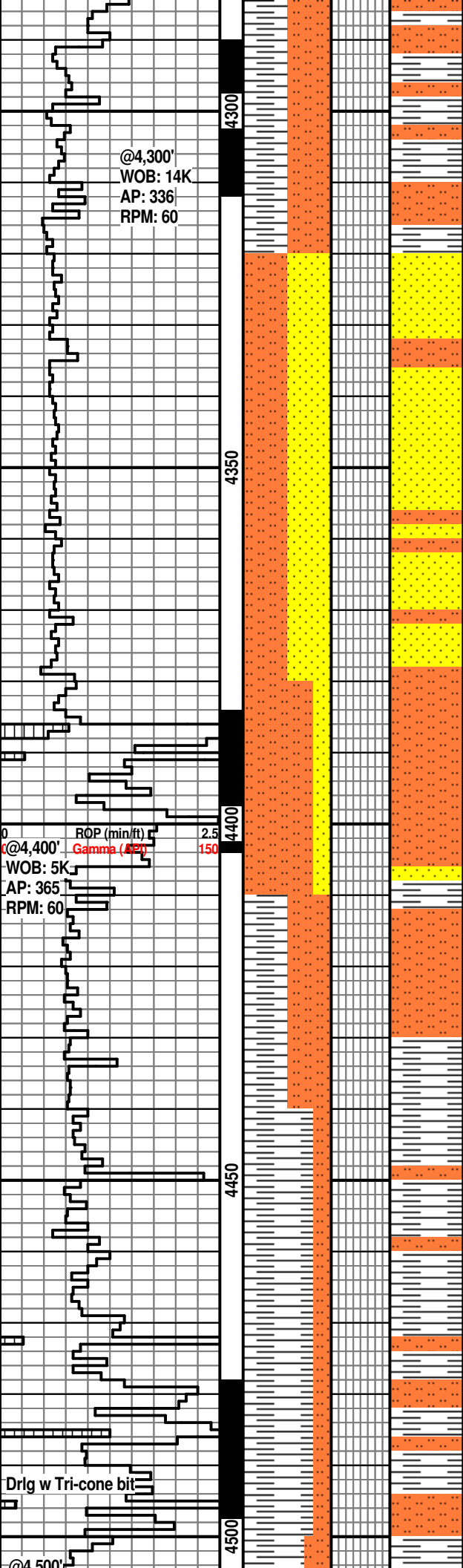
SH: gy- m gy, f- m tex, frm, sl hd ip, n calc, blk- pty, slty grdng to sltst ip, micmica ip; SLTST: lt- m gy, grd to slty sh ip, amorph- blk, micmica, fn pyr ip, sl calc- calc; SS: wht, vf- m gr, m- w srt, sbrd- rd, m- w cons, calc cmt

SLTST: lt- m gy, rd brn ip, grd to slty sh ip, amorph- blk, micmica, fn pyr ip, sl calc- calc; SH: gy- lt gy, f- m tex, frm, sl hd ip, n calc, blk- pty, slty grdng to sltst ip, micmica ip

SH: gy- lt gy, f- m tex, frm, sl hd ip, n calc, blk- pty, slty grdng to sltst ip, micmica ip; SLTST: lt- m gy, grd to slty sh ip, amorph- blk, micmica, fn pyr ip, sl calc- calc;

SH: gy- lt gy, f- m tex, frm, sl hd ip, n calc, blk- pty, slty grdng to sltst ip, micmica ip; SLTST: lt- m gy, grd to slty sh ip, amorph- blk, micmica, fn pyr ip, sl calc, tr calc





SH: gy-lt gy, f- m tex, frm, sl hd ip, n calc, blk- pty, slty grnd to sltst ip, micmica ip; SLTST: lt-m gy, grd to slty sh ip, amorph-blky, micmica, fn pyr ip, sl calc, tr calc

EST. TOP BENSON SANDS @ 4350'MD

SS: ngy, occ ltgy-wh, vf-f gr, w srt, sbrd-rd, w cons, sil cmt, no vis por, SLTST: mgy occ dk gy, dll lstr, sm txt, sbbkly, frm-hd, mod- ind, non calc

SS: ngy, occ ltgy-wh, vf-f gr, w srt, sbrd-rd, w cons, sil cmt, no vis por, SLTST: mgy occ dk gy, dll lstr, sm txt, sbbkly, frm-hd, mod- ind, non calc

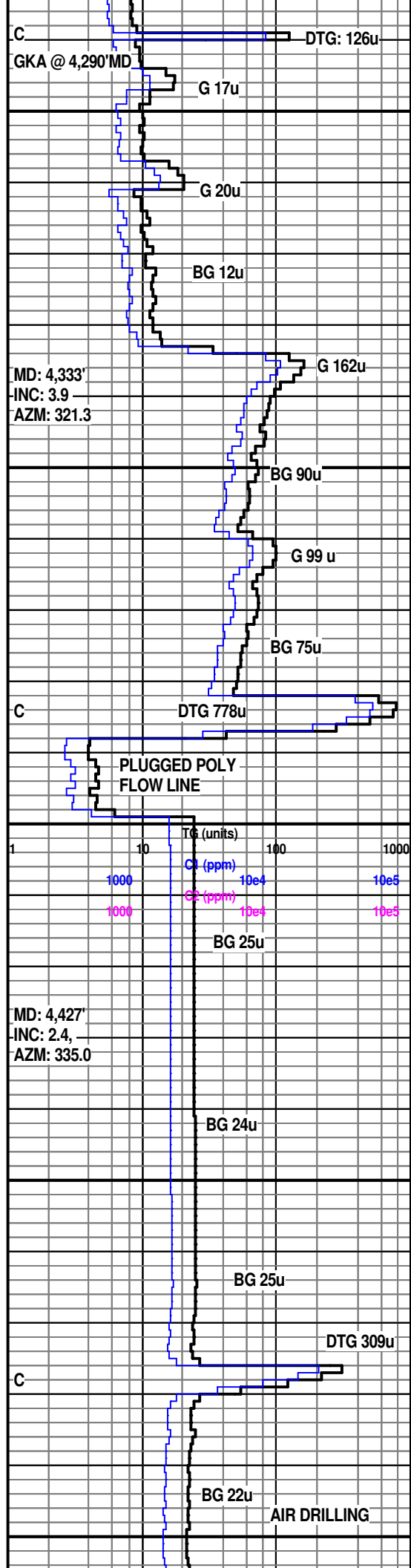
BRAILER FM @4410'MD

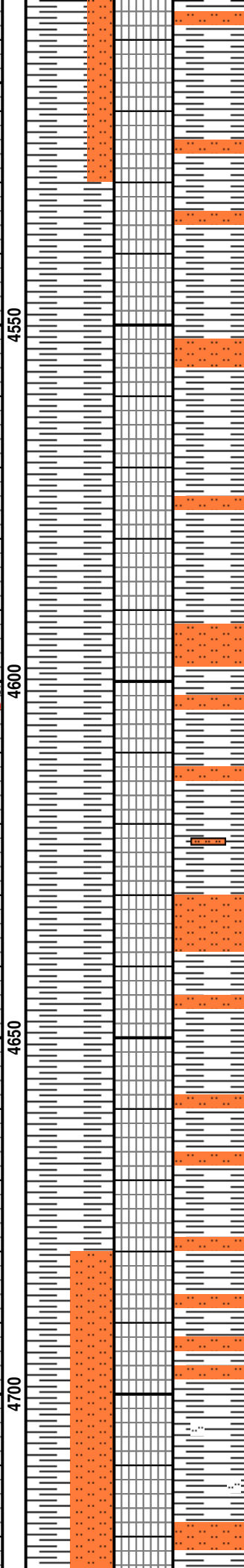
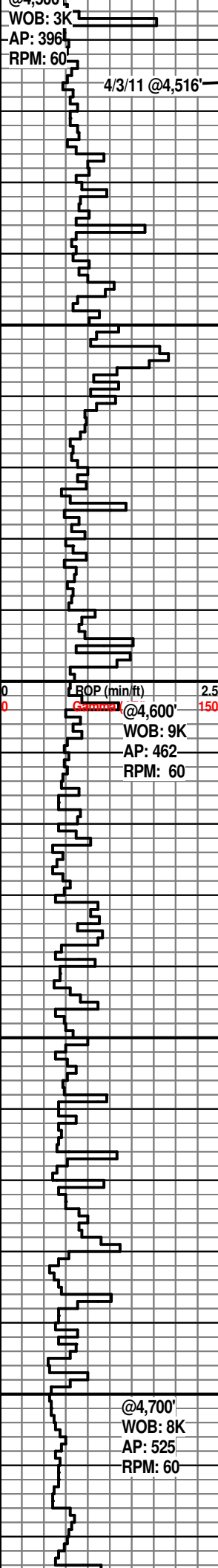
SLTST: mgy occ dk gy, dll lstr, sm txt, sbbkly, frm-hd, mod- ind, non calc SS: mgy, vf-f gr, w srt, sbrd-sbang., mod cons, no vis por, sil cmt

SH: mgy, dll lstr, sm txt, sbbkly, occ pty, frm-occ hd, mod ind, non calc, SLTST: mgy occ dk gy, dll lstr, sm txt, sbbkly, frm-hd, mod- ind, non calc

SH: mgy, dll lstr, sm txt, sbbkly, occ pty, frm-occ hd, mod ind, non calc, SLTST: mgy occ dk gy, dll lstr, sm txt, sbbkly, frm-hd, mod- ind, non calc

SH md-dk gy, dll lstr, sm txt, occ slty txt, sbbkly occ pty, frm-hd, mod ind, non-v sl calc, SLTST: m-dkgy, dll lstr, sm txt, sbbkly, frm, mod ind, non calc





SH: mgy, sme dkgy, dll lstr, sm txt, sbblky-irrr, frm, mod ind, non calc, tr SLTST

SH: mgy, sme dkgy, dll lstr, sm txt, sbblky-irrr, frm, mod ind, non calc, tr SLTST

SH: mgy, sme dkgy, dll lstr, sm txt, sbblky, frm, mod ind, non calc, tr SLTST

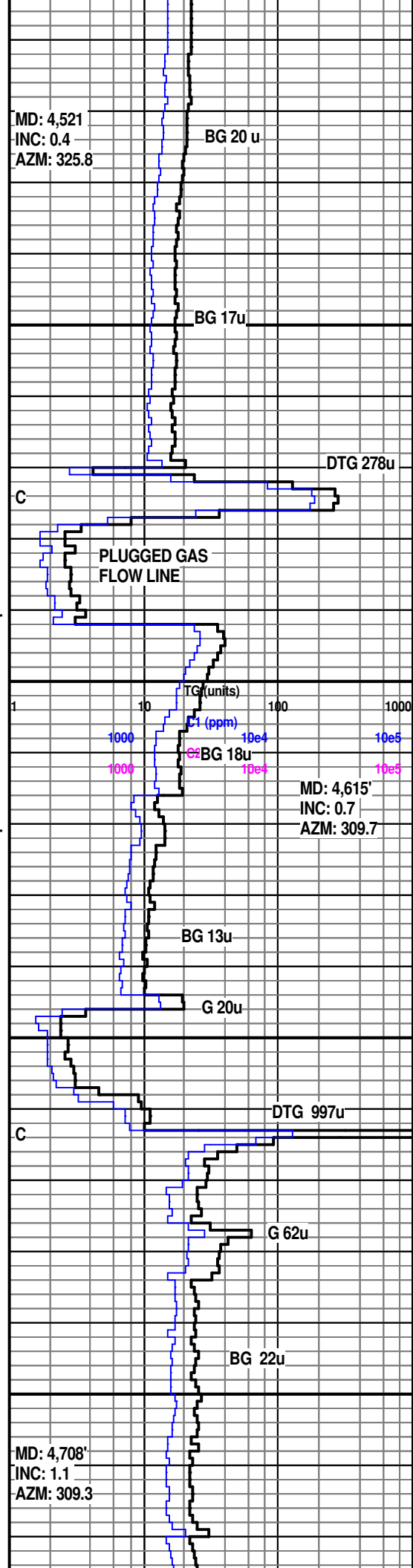
SH: mgy, sme dkgy, dll lstr, sm txt, sbblky, frm, mod ind, non calc, tr SLTST

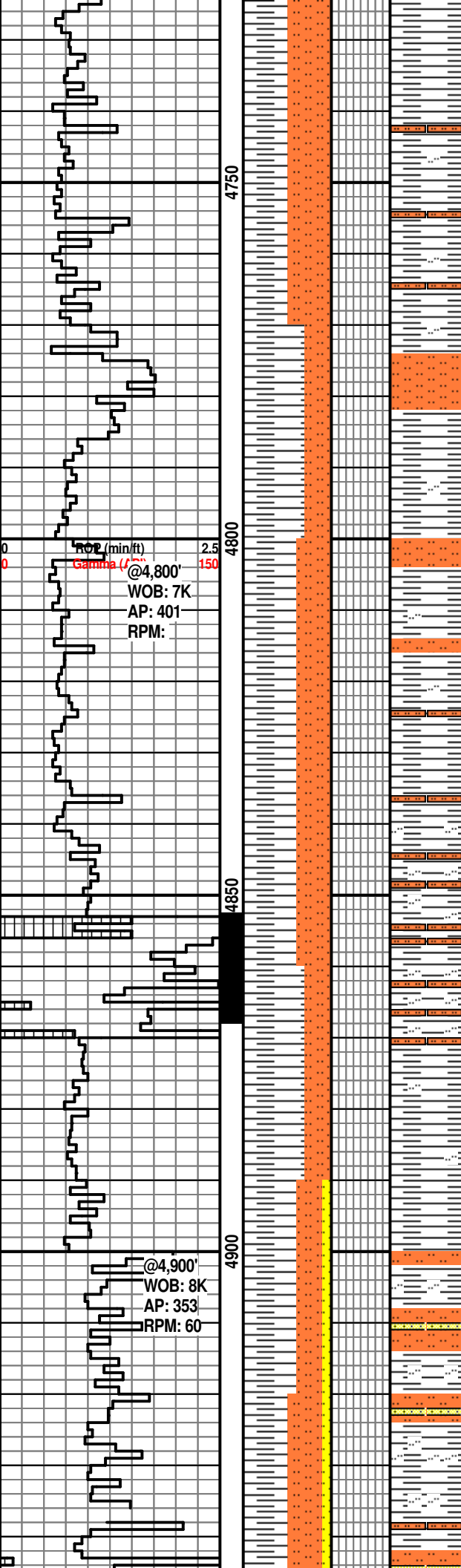
SH: mgy, sme dkgy, dll lstr, sm txt, sbblky, frm, mod ind, non calc

SH: mgy, sme dkgy, dll lstr, sm txt, sbblky, frm, mod ind, non calc

SH: mgy, sme dkgy, dll lstr, sm txt, sbblky, frm, mod ind, non calc

SH: mgy, sme dkgy, dll lstr, sm txt, sbblky, frm, mod ind, non calc, tr SLTST: m-dkgy, dll lstr, sm txt, sbblky, frm-hd, mod ind, non calc





SH: mgy, sme dkgy, dll lstr, sm txt, sbblyk occ plty, frm, mod ind, non calc, SLTST: m-dkgy, dll lstr, sm txt, sbblyk, frm-hd, mod ind, non calc

SH: gy, frm, blk- plty, amorph, slty ip grdng to sltst ip, n calc, tr sl calc, micmica; SLTST: lt gy, amorph -blk, micmica, fn pyr ip, n calc

SH: gy, frm, , blk- plty, amorph, slty ip grdng to sltst ip, micmica, n calc; SLTST: lt gy, amorph -blk, micmica, fn pyr ip, n calc

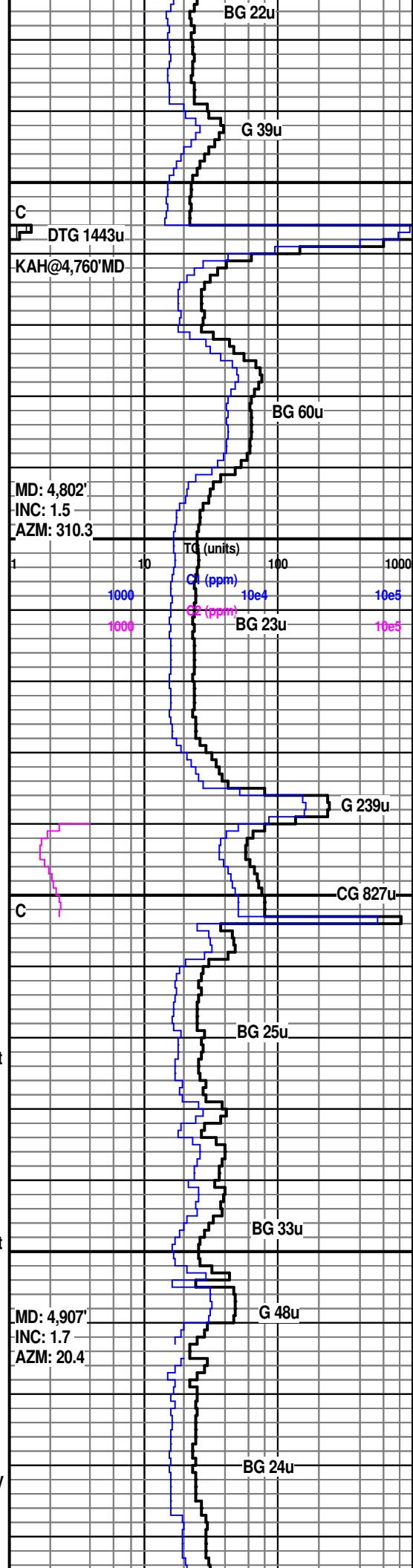
SH: gy, lt gy ip, tr lt rd brn, frm-sl hd, blk- plty, amorph ip, slty grdng to sltst ip, micmica, n calc; SLTST: lt gy, occ m gy, amorph -blk, micmica, fn pyr ip, n-sl calc

SH: gy-m gy, tr dk gy, sl hd, frm ip, blk- plty, pred sl slty, vry slty grdng to sltst ip, micmica, n calc; SLTST: vry lt gy-off wht, m gy-gy ip, pred amorph, blk ip, micmica, n calc

SH: gy-m gy, sl hd-hd, frm ip, blk-amorph, pred sl slty, vry slty grdng to sltst ip, micmica, n calc; SLTST: vry lt gy-off wht, m gy-gy ip, pred amorph, blk ip, micmica, n calc

SH: gy-m gy, sl hd-hd, frm ip, blk-amorph, pred sl slty, vry slty grdng to sltst ip, micmica, n calc; SLTST: vry lt gy-off wht, m gy-gy ip, pred amorph, blk ip, slt-vf snd gr in it-m gr mtx, grd to slty sh ip micmica, n calc; SS: ltgy-wh, vf-f gr, w srt, sbrd-rd, w cons, sil cmt, no vis por

SH: gy-m gy, sl hd-frm, blk-amorph, slty grdng to sltst ip, micmica, n calc; SLTST: vry lt gy-off wht, amorph, blk ip, slt-vf snd gr in it-m gr mtx, grd to slty sh ip, micmica, n calc; SS: ltgy-wh, vf-f gr, w-p srt, sbrd-rd, w cons, sil cmt



BG 22u
G 39u

C
DTG 1443u
KAH@4,760'MD

BG 60u
MD: 4,802'
INC: 1.5
AZM: 310.3

TCO (units)
Cl (ppm)
SO4 (ppm)
BG 23u
G 239u

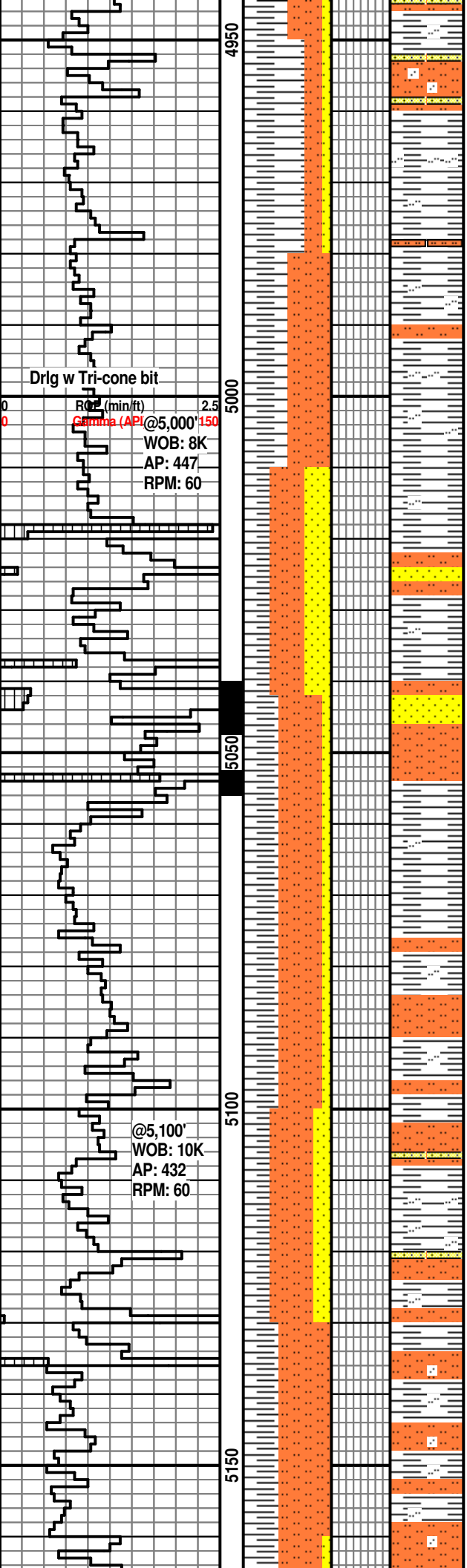
C
CG 827u

BG 25u

BG 33u

G 48u
MD: 4,907'
INC: 1.7
AZM: 20.4

BG 24u



SH: gy-m gy, sl hd-hd, frm ip, blk-amorph, pty ip, slty grdng to sltst ip, micmica, n calc; SS: wht, vf-f gr, w srt, sbrd-rd, w cons, sil/calc cmt

SH: pred lt gy, m-mdk gy ip, blk-pty, n calc, slty ip grdng to arg sltst; SLTST: lt gy, amorph, blk ip, slt-vf snd gr in it-m gr mtx ip, grd to slty sh ip, micmica, n calc, fd/nod pyr ip;

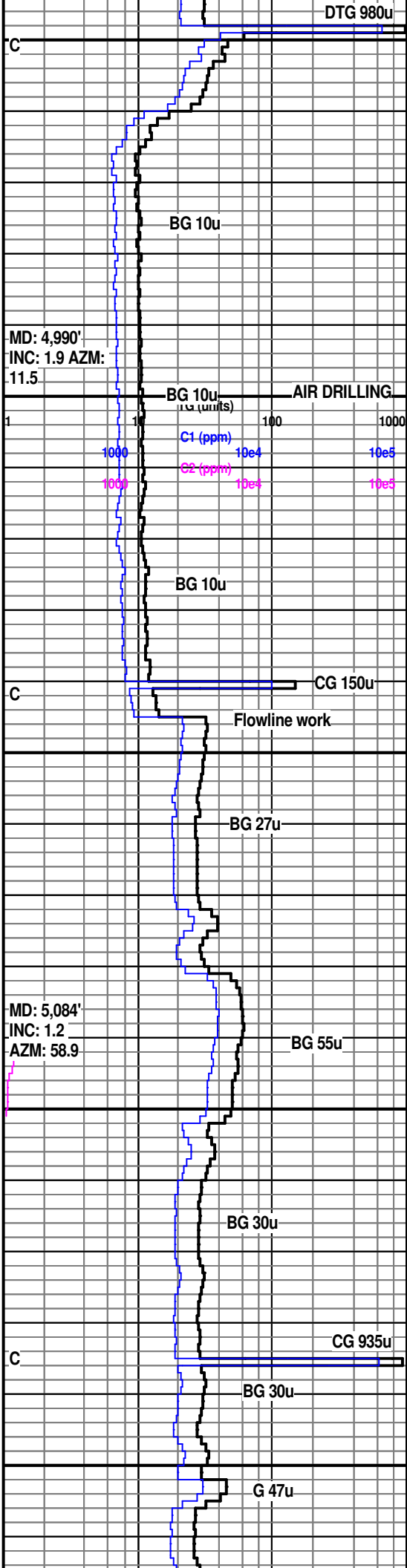
SH: lt gy-gy, hd, vry hd/frm ip, blk-pty, n calc, slty ip grdng to arg sltst; SLTST: lt gy, amorph, blk ip, hd, slt-vf snd gr in it-m gr mtx ip, grd to slty sh ip, micmica, n calc; SS: pred wht, ltgy ip, vf-f gr, w srt, sbrd-rd, w cons, sil cmt

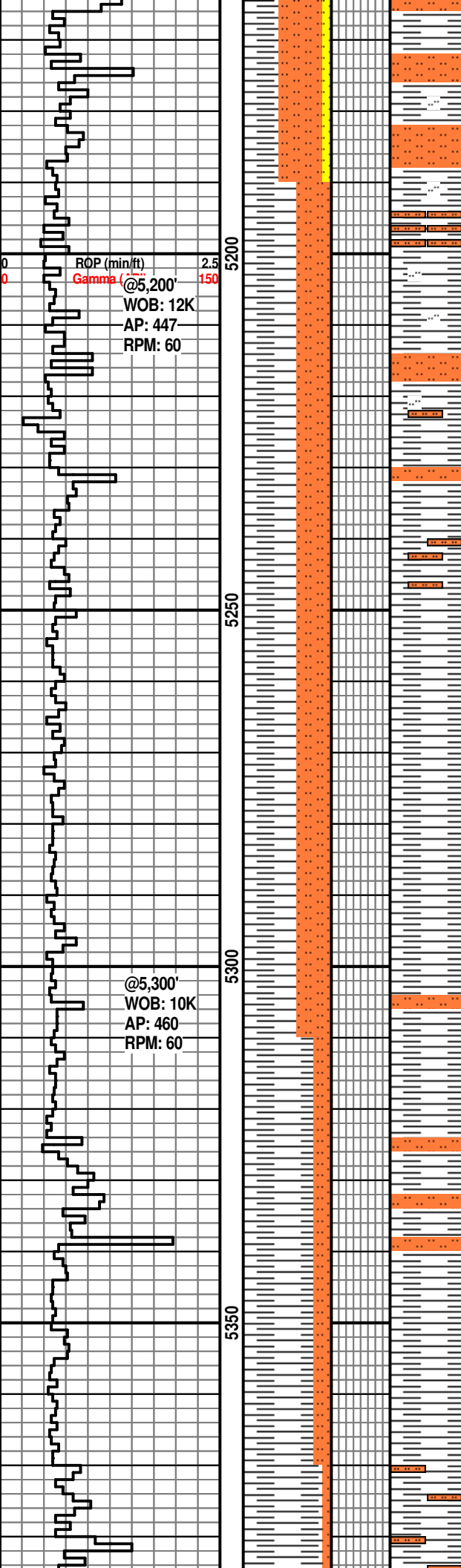
SH: lt gy-gy, hd, vry hd/frm ip, blk-pty, n calc, slty ip grdng to arg sltst; SLTST: lt gy-wht, amorph, blk ip, hd, slt-vf snd gr in it-m gr mtx ip, grd to slty sh ip, micmica, n calc occ vf carb incls; SS: pred wht, ltgy ip, vf-f gr, w srt, sbrd-rd, w cons, sil cmt

SLTST: lt gy-wht, amorph, blk ip, hd, slt-vf snd gr in it-m gr mtx ip, grd to slty sh ip, micmica, n calc occ vf carb incls; SH: lt gy-gy, hd, vry hd/frm ip, blk-pty, n calc, slty ip grdng to arg sltst; tr SS

SLTST: lt gy, amorph, hd, slt-vf snd gr in it-m gr mtx ip, grd to slty sh ip, micmica, n calc; SH: lt gy-gy, hd, blk, n calc, slty ip grdng to arg sltst; SS: pred wht, ltgy ip, vf-f gr, w srt, sbrd-rd, w cons, calc cmt

SLTST: lt gy, m gy ip, amorph, hd, tr vry hd/frm, slt-vf snd gr in it-m gr mtx ip, grd to slty sh ip, micmica, pred n calc, sl calc-calc ip; SH: lt gy-gy, dk brn ip, hd-frm, blk-pty, n calc, slty ip grdng to arg sltst





SLTST: lt gy, amorph, hd, tr vry hd/frm, slit-vf snd gr in it-m gr mtx ip, grd to slty sh ip, micmica, pred n calc, sl calc-calc ip; SH: lt gy, hd-frm, blkly-plty, n calc, slty ip grdng to arg sltst; SS: wht, vf-f gr, w srt, sbrd-rd, w cons, calc cmt

SH: lt gy-gy, md gy ip, hd-frm, blkly-plty, n calc, slty ip grdng to arg sltst, micmica, fd pyr ip; SLTST: lt gy, amorph, hd, tr vry hd/frm, micmica, n -sl calc-calc ip

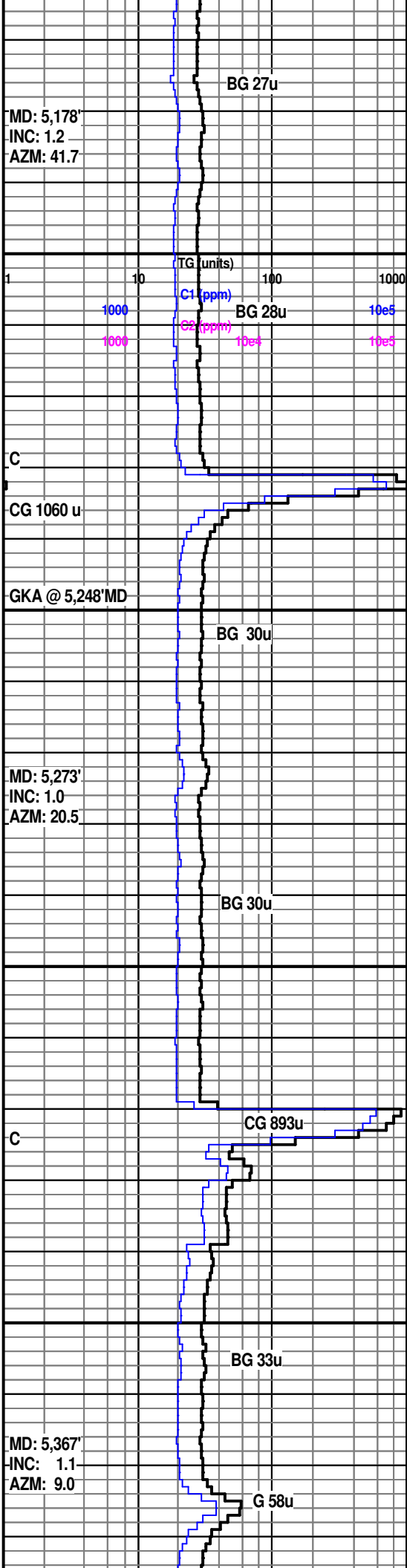
SH: lt gy-gy, md gy ip, hd-frm, blkly-plty, n calc, slty ip grdng to arg sltst, micmica, fd pyr ip; SLTST: lt gy, amorph, hd, tr vry hd/frm, micmica, n -sl calc-calc ip

SH: mgy sme lt gy, dl llstr, sm txt, sbblky, frm-hd, mod ind, non cal. mic mica, arg ip, slty ip grdng SLTST: mgy, dll lstr, sm txt, sbblky, frm, mod ind, non calc

SH: mgy sme lt gy, dl llstr, sm txt, sbblky, frm-hd, mod ind, non cal. mic mica, arg ip, slty ip grdng SLTST: mgy, dll lstr, sm txt, sbblky, frm, mod ind, non calc

SH: mgy sme lt gy, dl llstr, sm txt, sbblky, frm-hd, mod ind, non calc, mic mica, w/ SLTST: mgy, dll lstr, sm txt, sbblky, frm, mod ind, non calc

SH: mgy sme lt gy, dl llstr, sm txt, sbblky, frm-hd, mod ind, non calc. w/ SLTST: mgy, dll lstr, sm txt, sbblky, frm, mod ind, non calc



MD: 5,178'
INC: 1.2
AZM: 41.7

TG (units)
C1 (ppm)
C2 (ppm)
BG 27u
BG 28u
10e5
10e3

CG 1060 u

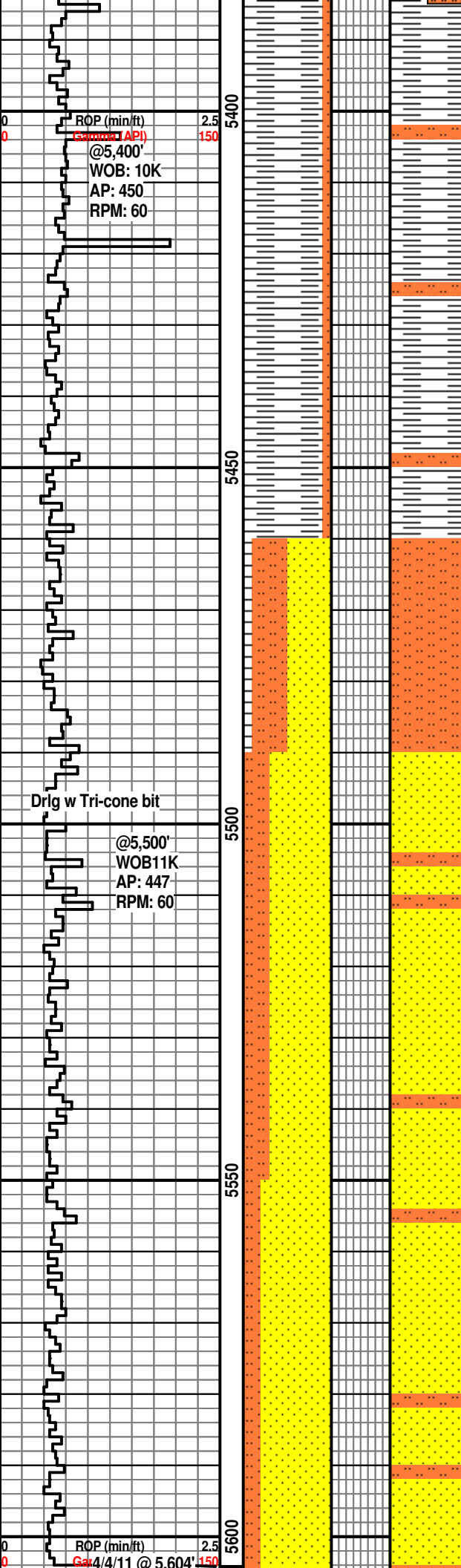
GKA @ 5,248'MD

MD: 5,273'
INC: 1.0
AZM: 20.5

CG 893u

MD: 5,367'
INC: 1.1
AZM: 9.0

G 58u



SH: mgy sme lt gy, dll lstr, sm txt, sbbiky, frm-hd, mod ind, non calc. tr SLTST

SH: mgy sme lt gy, dll lstr, sm txt, sbbiky, occ pty, frm-hd, mod ind, non-v sl calc. tr SLTST

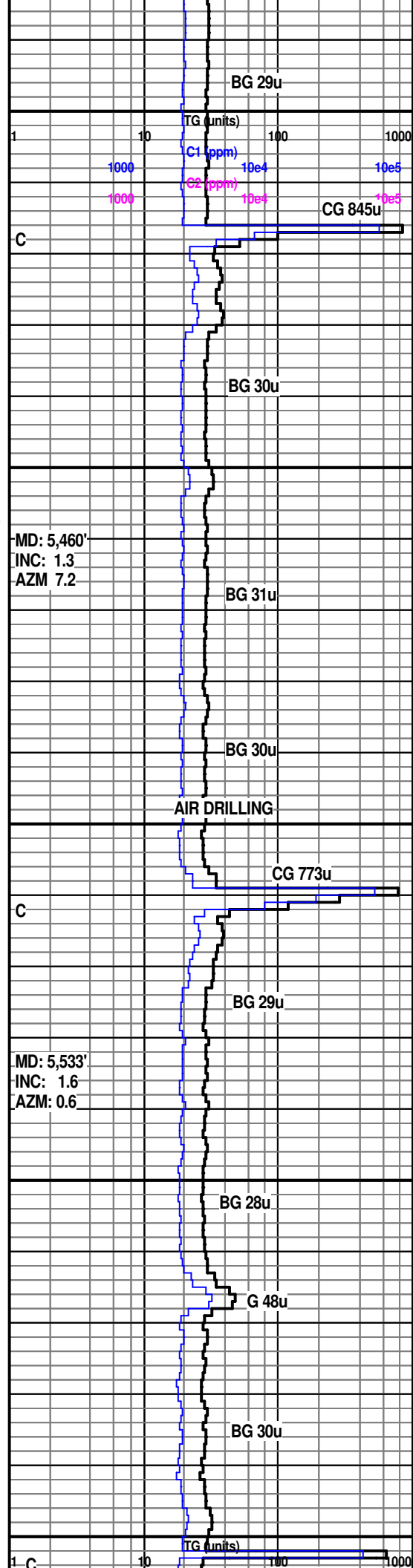
SH: mgy sme lt gy, dll lstr, sm txt, sbbiky, occ pty, frm-hd, mod ind, non-v sl calc. tr SLTST

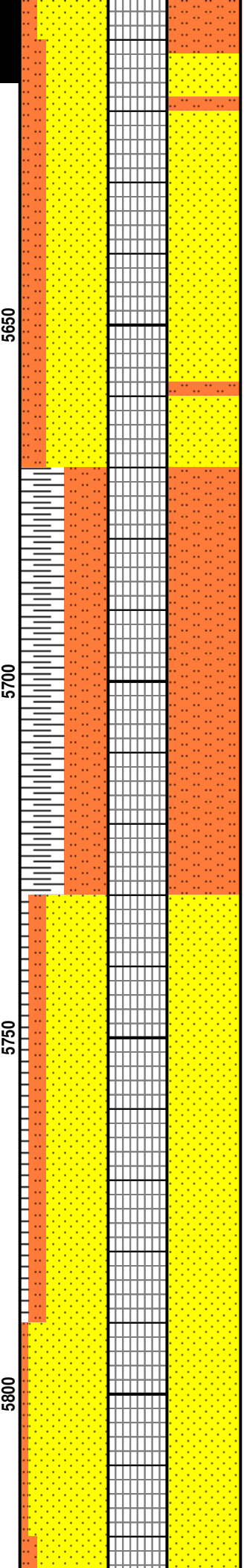
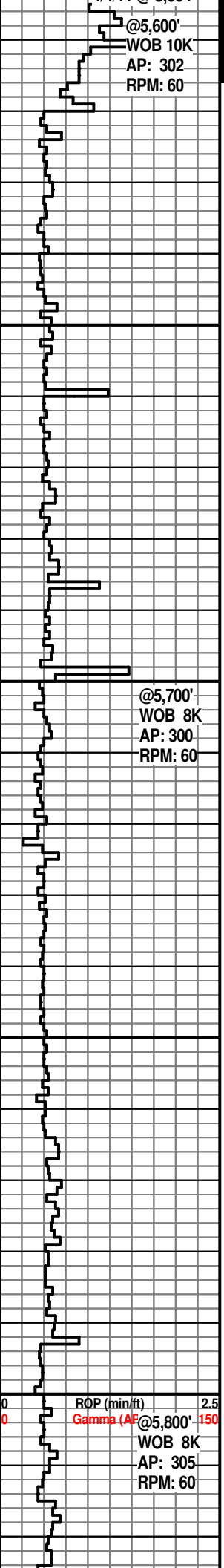
SLTST: mgy, dll lstr, sm-occ rgh txt, sbbiky occ pty, frm-hd, non-v sl calc, mod-w ind, SS: lt-mgy, vf-f gr, w srt, sbrg-rd occ sbang, sil cmt, no vis por

SS: lt-mgy, vf-f gr, w srt, sbrd-sbang, w cons, sil cmt, no vis por, tr Pyr, SLTST: mgy, dll lstr, sm-occ rgh txt, sbbiky occ pty, frm-hd, non-v sl calc, mod-w ind

SS: lt-mgy, vf-f gr, w srt, sbrd-sbang, w cons, sil cmt, no vis por, tr Pyr, SLTST: mgy, dll lstr, sm-occ rgh txt, sbbiky occ pty, frm-hd, non-v sl calc, mod-w ind

SS: lt-mgy, occ brn, vf-f gr, w srt, sbrd-sbang, w cons, sil cmt, no vis por, tr Pyr, SLTST: mgy, dll lstr, sm-occ rgh txt, sbbiky occ pty, frm-hd, non-v sl calc, mod-w ind





SS; lt-mgy, occ brn, vf-f gr, w srt, sbrd-sbang, w cons, sil cmt, no vis por, tr Pyr, SLTST: mgy, dll lstr, sm-occ rgh txt, sbbkly occ plty, frm-hd, non-v sl calc, mod-w ind

SS; lt-mgy, vf-f gr, w srt, sbrd-sbang, w cons, sil cmt, no vis por, tr Pyr, SLTST: mgy, dll lstr, sm-occ rgh txt, sbbkly occ plty, frm-hd, non-v sl calc, mod-w ind

SS; lt-mgy, vf-f gr, w srt, sbrd-sbang, w cons, sil cmt, no vis por, tr Pyr, SLTST: mgy, dll lstr, sm-occ rgh txt, sbbkly occ plty, frm-hd, non-v sl calc, mod-w ind

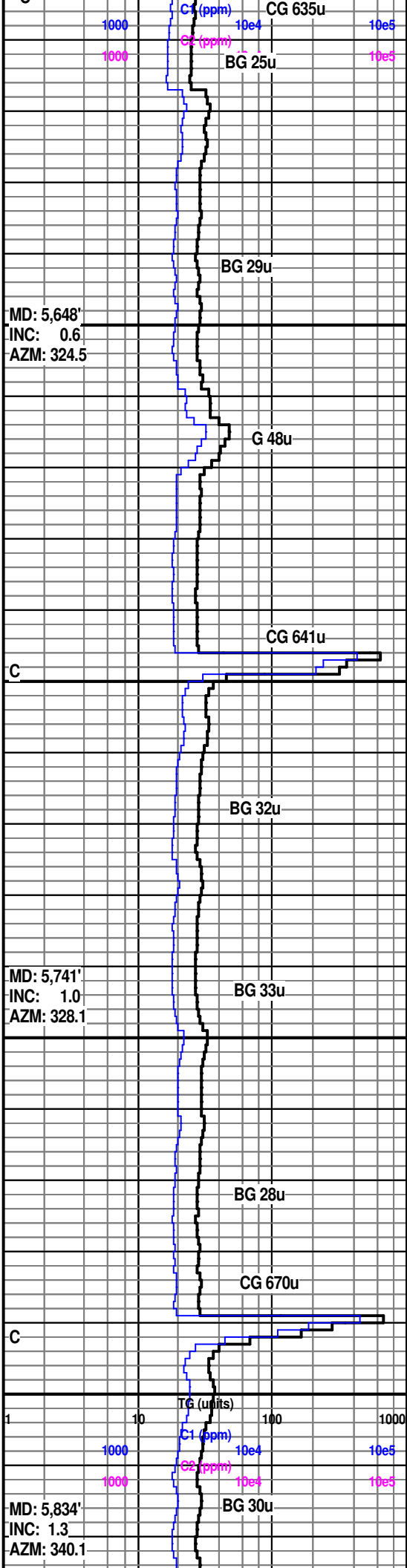
SLTST: mgy, dll lstr, sm-occ rgh txt, sbbkly occ plty, frm-hd, non-v sl calc, mod-w ind, w/ SH: mgy, dll lstr, sm txt, irr-plty, sme sbbkly, frm-hd, non calc, tr Pyr

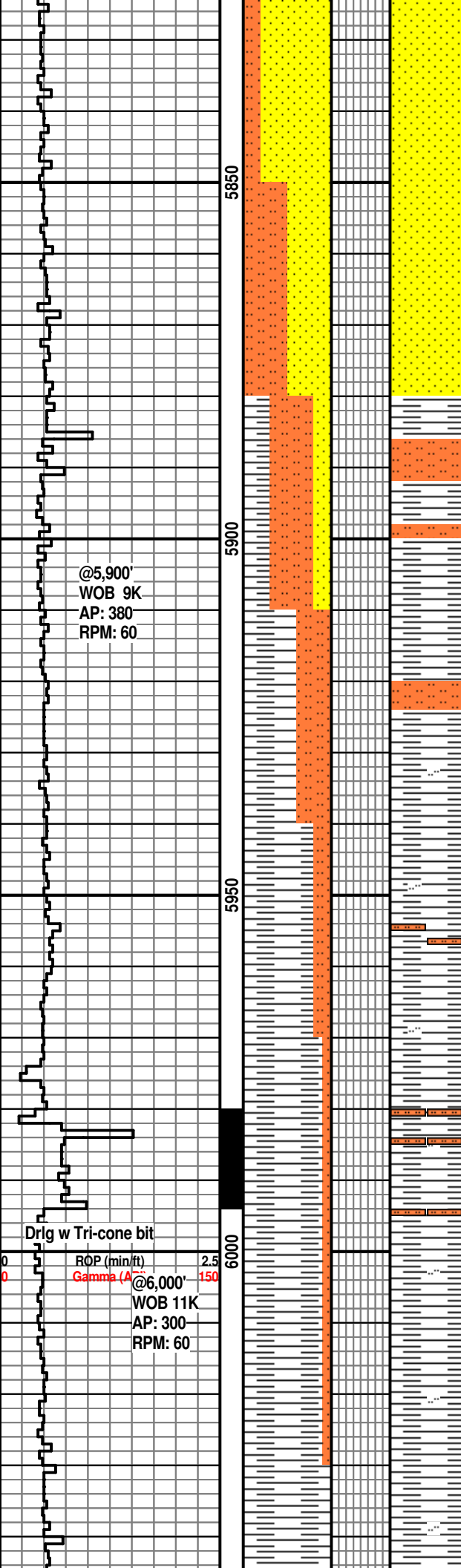
SLTST: mgy, dll lstr, sm-occ rgh txt, sbbkly occ plty, frm-hd, non-v sl calc, mod-w ind, w/ SH: mgy, dll lstr, sm txt, irr-plty, sme sbbkly, frm-hd, non calc, tr Pyr

SS; lt-mgy, vf-f gr, w srt, sbrd-sbang, w cons, sil cmt, no vis por, SLTST: mgy, dll lstr, sm-occ rgh txt, sbbkly occ plty, frm-hd, non-v sl calc, mod-w ind,, tr SH

SS; lt-mgy, vf-f gr, w srt, sbrd-sbang, w cons, sil cmt, no vis por, tr SLTST

SS; lt-mgy, vf-f gr, w srt, sbrd-sbang, w cons, sil cmt, no vis por, tr SLTST





SS; lt-mgy, vf-f gr, w srt, sbrd-sbang, w cons, sil cmt, no vis por, tr SLTST

SS; lt-mgy, vf-f gr, w srt, sbrd-sbang, w cons, sil cmt, no vis por, SLTST: m gy, dll lstr, sm txt, sbbky-pty, frm-hd, mod-w ind, non calc

SLTST: lt gy, amorph, blkyp, hd, slit-vf snd gr in it-m gr mtx ip, grd to slty sh ip, micmica, n calc; SH: lt gy-gy, hd, vry hd/frm ip, blkyp-pty, n calc, slty ip grndg to arg sltst; SS: pred wht, ltgy ip, vf-f gr, w srt, sbrd-rd, w cons, sil cmt

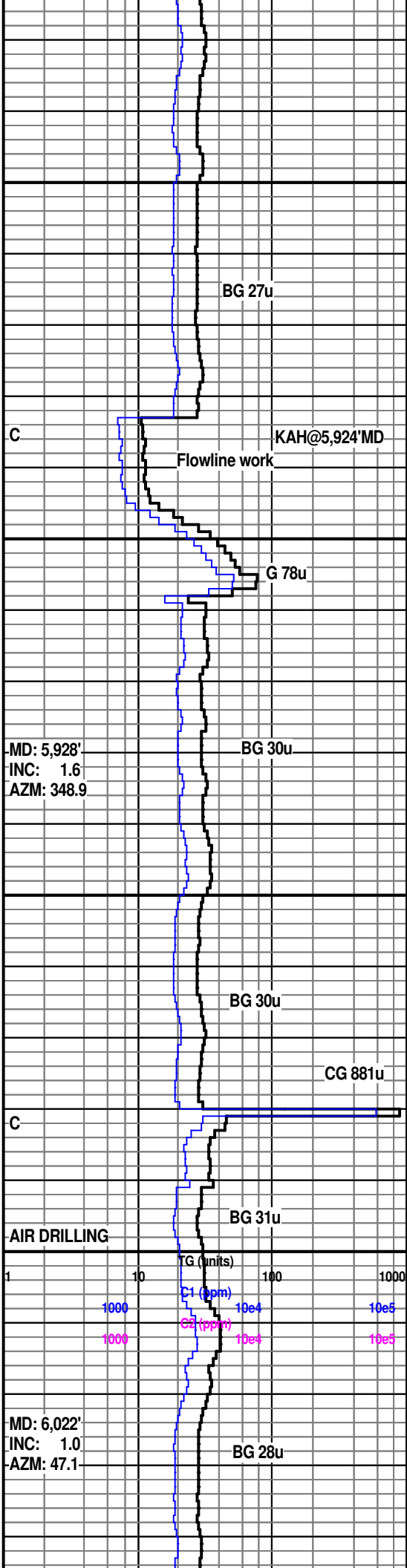
SH: lt gy-gy, m gy ip, tr lt brn, frm-hd, blkyp-pty, n calc, slty grndg to arg slts ip; SLTST: lt gy-gy, m gy ip, amorph, blkyp, hd, grd to slty sh ip, micmica, n-vry sl calc

SH: lt gy-gy, m gy ip, frm-hd, blkyp-pty, n calc, slty grndg to arg slts ip; SLTST: lt gy-gy, m gy ip, amorph, blkyp, hd, grd to slty sh ip, micmica, n-vry sl calc

SH: lt gy ip, m gy ip, dk gy ip, frm-hd, blkyp-pty, n calc, slty grndg to arg slts ip; tr SLTST: lt gy-gy, m gy ip, amorph, blkyp, hd, grd to slty sh ip, micmica, n-vry sl calc

SH: pred m gy, dk gy ip, frm, blkyp-pty, n calc, slty grndg to arg slts ip, micmica; tr SLTST: gy-m gy, amorph, blkyp, hd, grd to slty sh ip, micmica, n calc

SH: pred m gy, dk gy ip, frm, blkyp-pty, n calc, slty grndg to arg slts ip, micmica, fd pvr



BG 27u

KAH@5,924'MD

Flowline work

G 78u

MD: 5,928'
INC: 1.6
AZM: 348.9

BG 30u

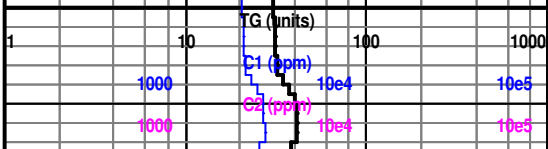
BG 30u

CG 881u

C

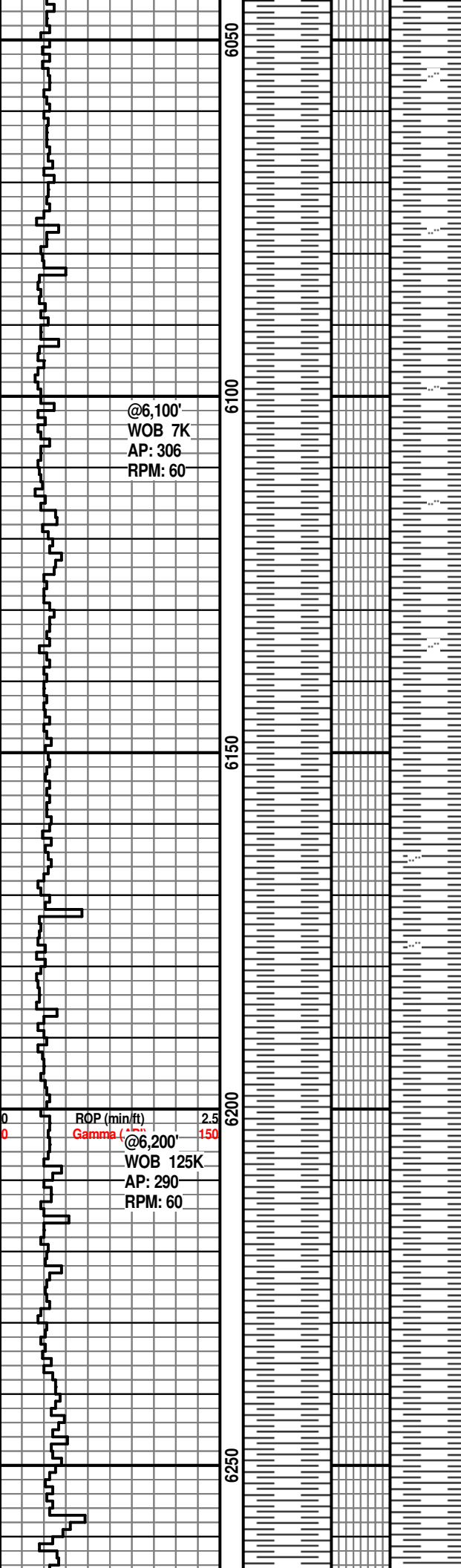
BG 31u

AIR DRILLING



MD: 6,022'
INC: 1.0
AZM: 47.1

BG 28u



SH: pred m gy, dk gy ip, lt gy ip, frm-sl hd, hd ip, blk-pty, amorph ip, n calc, slty grdng to arg slts ip, micmica, fd pyr ip

SH: m-gy ip, lt gy ip, frm-sl hd, hd ip, blk-pty, amorph ip, n calc, sl calc ip, slty grdng to arg slts ip, micmica, rr fd pyr

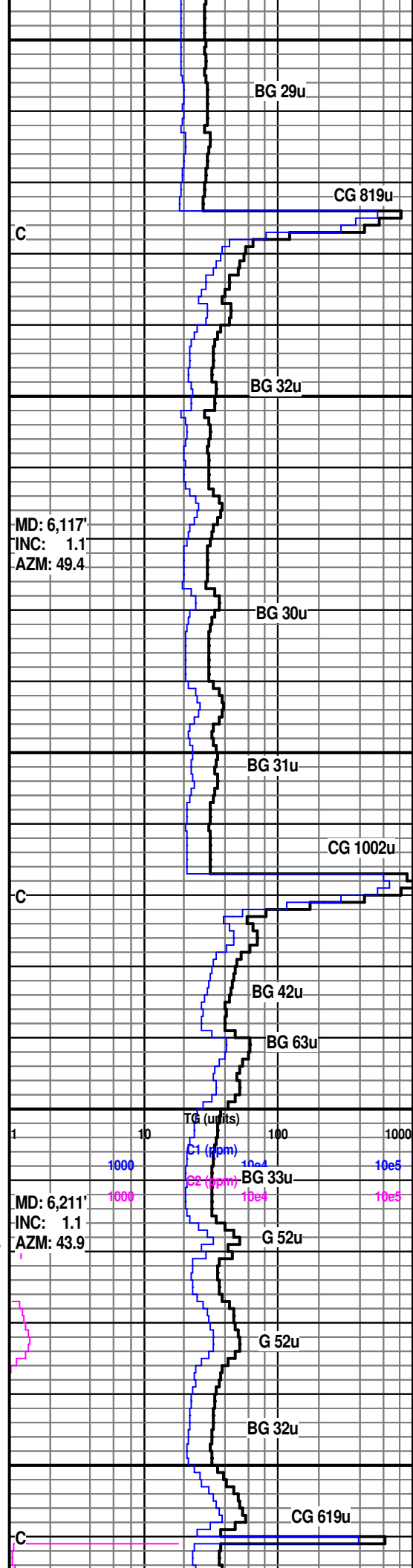
SH: m-dk gy ip, gy/blk ip, frm-sl hd, hd ip, blk-pty, amorph ip, n calc, slty grdng to arg slts ip, micmica

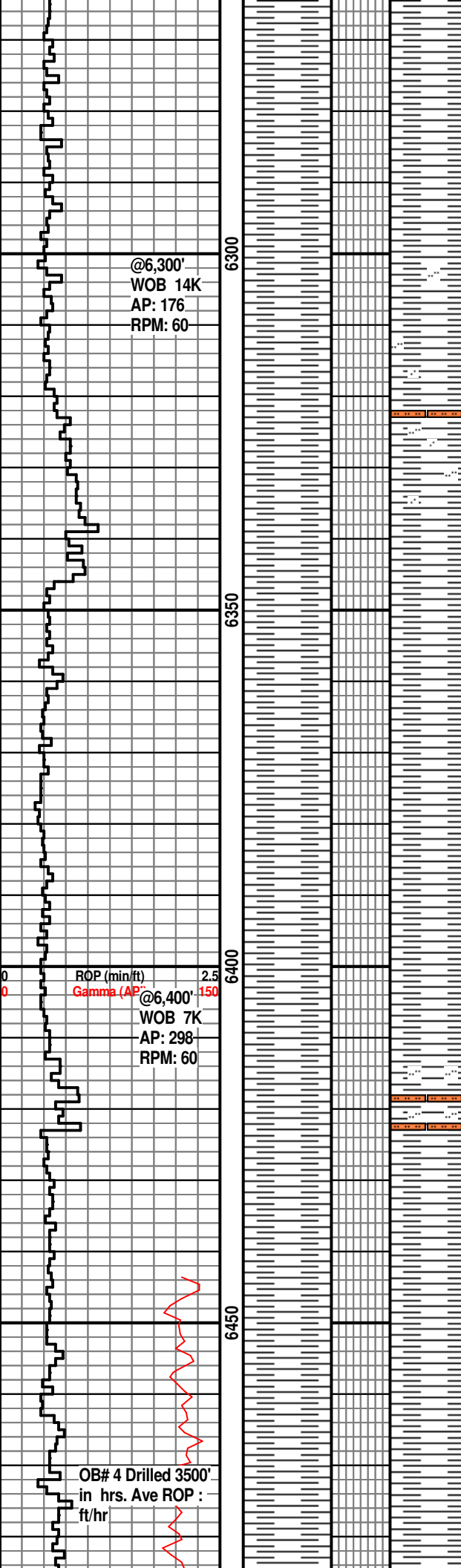
SH: pred m gy, gy ip, frm-sl hd, hd ip, blk-pty, amorph ip, n calc, slty grdng to arg slts ip, micmica, rr fd pyr

SH: m-dk gy, gy ip, frm-sl hd, hd ip, blk-pty, amorph ip, n calc, rr fd pyr

SH: m-dk gy, gy ip, rr blk, frm-sl hd, hd ip, pred blk, pty ip, tr amorph, n calc, tr vry sl calc, micmica, rr fd pyr

SH: m-dk gy, gy-lt gy ip, pred frm, sl hd-hd ip, blk, pty ip, occ amorph, n calc, tr sl calc, tr slty grd to sltst, micmica ip





@6,300'
WOB 14K
AP: 176
RPM: 60

6300

6350

6400

6450

ROP (min/ft) 2.5
Gamma (AP) 150
@6,400'
WOB 7K
AP: 298
RPM: 60

OB# 4 Drilled 3500'
in hrs. Ave ROP :
ft/hr

SH: m-dk gy, gy-lt gy ip, vry dk gy- blk ip, frm, sl hd ip, blk, plty ip, occ amorph, n calc, micmica, rr fd pyr

SH: pred dk gy, gy-md gy ip, vry dk gy-blk ip, frm, sl hd ip, blk, plty ip, occ amorph, n calc, slty grd to sltst ip, tr sndy grn in arg mtz, micmica, rr fd pyr

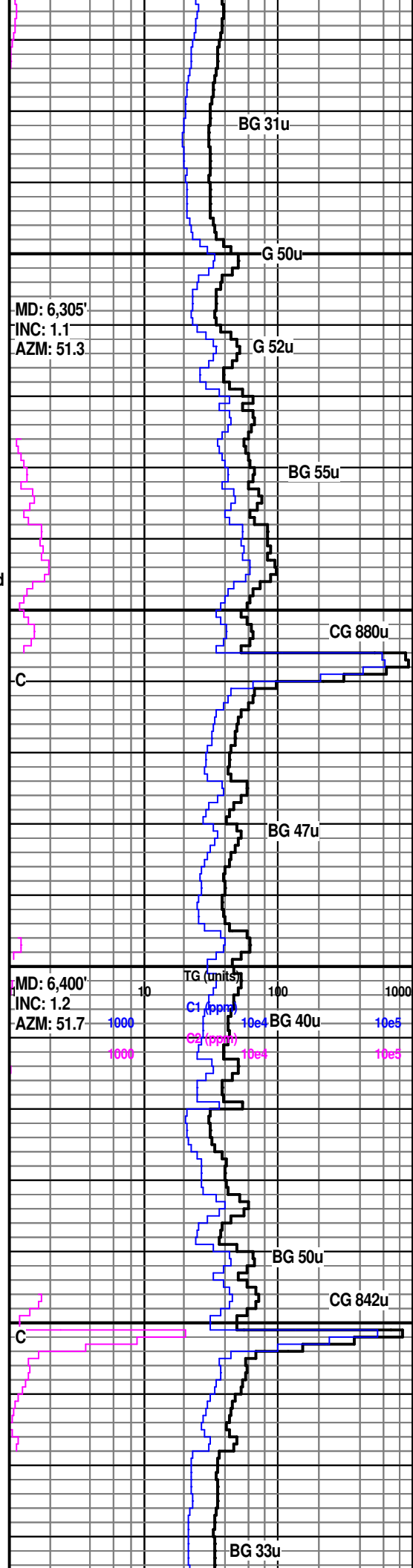
SH: gy-md gy ip, blk ip, frm, sl hd ip, blk, plty ip, occ amorph, n calc, slty grd to sltst ip, micmica, fd pyr

SH: gy-md gy ip, tr vry dk gy-dk gy, frm-sl hd, blk- amorph, n calc, slty grd to sltst ip, micmica

SH: pred dk gy, gy-md gy ip, tr vry dk gy, frm-sl hd, blk-amorph plty ip, n calc, slty grd to sltst ip, micmica, fd pyr

SH: dk-vry dk gy ip, gy-md gy ip, blk ip, frm-sl hd, sme hd, sl frm ip, blk-amorph, plty ip, n calc, sl calc ip, slty grd to sltst ip, micmica, fd pyr

SH: dk gy ip, gy-md gy ip, frm-sl hd, sme hd, sl frm ip, blk- amorph, plty ip, n calc, sl calc ip, slty grd to sltst ip, micmica



MD: 6,305'
INC: 1.1
AZM: 51.3

MD: 6,400'
INC: 1.2
AZM: 51.7

TG (units)
C1 (ppm) 10e4
C2 (ppm) 10e4
1000 100 10000 10000

BG 31u

G 50u

G 52u

BG 55u

CG 880u

BG 47u

BG 40u

BG 50u

CG 842u

BG 33u

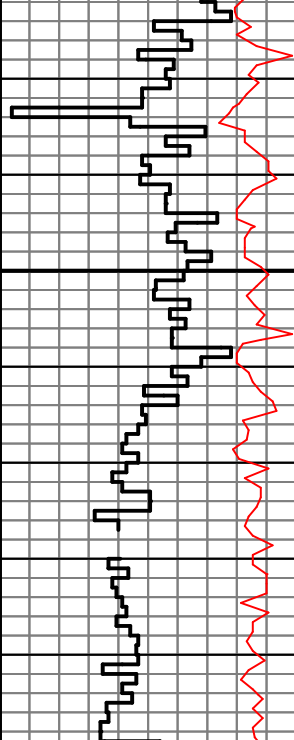
C

C

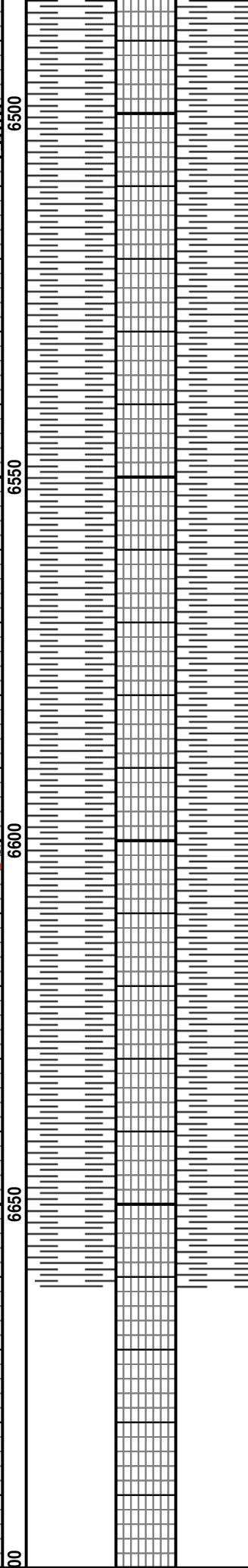
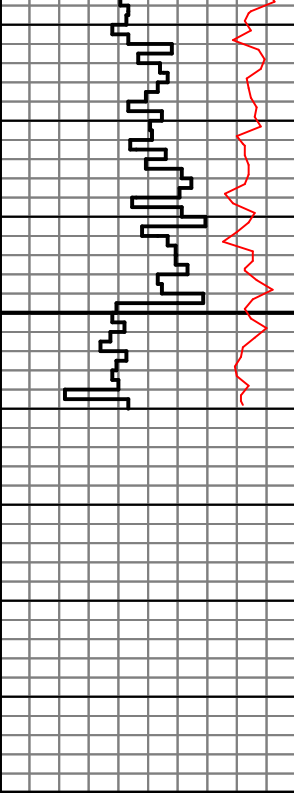
NB# 5. Ulterra-PDC
 @ 6,500'MD. Type:
 UD513. Ser# 6913.
 Jets: 5x20s & 2x18s.
 MM#1

4/5/2011@6,500'

@6,500'
 WOB 7K
 PP: 2692
 RPM: 50
 GPM: 461



ROP (min/ft) 2.5
 Gamma (API) 150
 @6,600'
 WOB 10K
 PP: 3876
 RPM: 50
 GPM: 456



SH: dk gy ip, gy-md gy ip, frm-sl hd, sme hd, sl frm ip, blk- amorph, plty ip, n calc, sl calc ip, slty grd to sltst ip, micmica

Switch to OBM @6,500'MD

SH: gy-md gy, frm-sl frm, blk- amorph, plty ip, n calc, sl calc ip, slty grd to sltst ip, micmica

SH: gy-ltgy, frm-sl frm ip, sft ip, blk- amorph, n calc, slty grd to sltst ip, micmica

SH: gy-ltgy, vry dk gy-blk ip, frm-sl frm ip, sft ip, blk- amorph, n calc, micmica

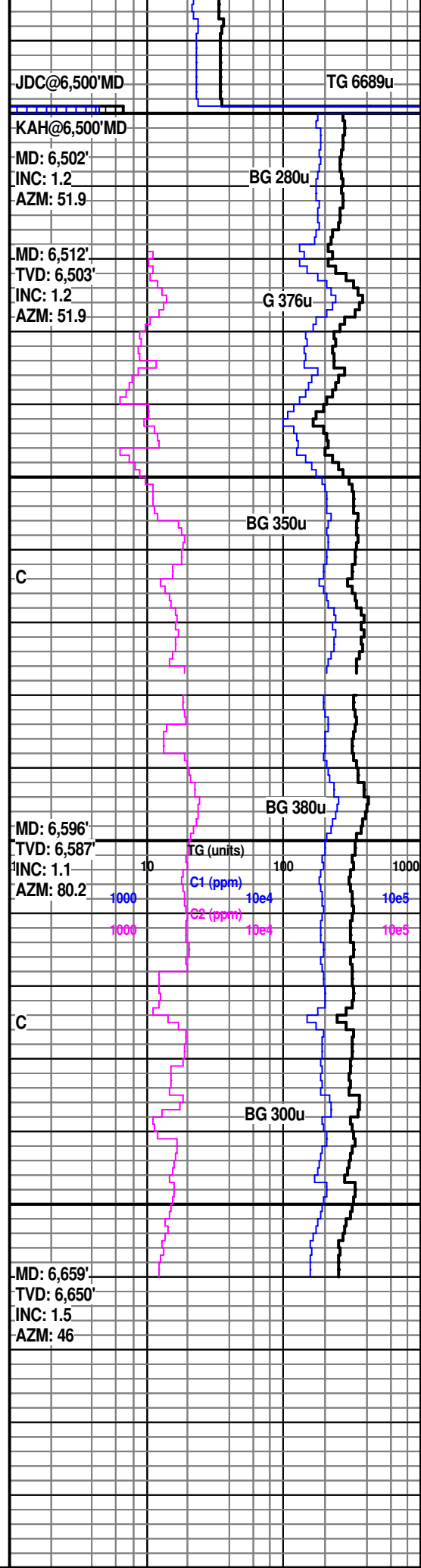
SH: gy-ltgy, vry dk gy-blk ip, sl frm-sft, blk- amorph, n calc, micmica, tr slty, rr fd pyr

SH: gy-mgy, vry dk gy-blk ip, lt gy ip, sl frm-sft, blk- amorph, n calc, micmica, tr slty, fd pyr

SH: gy-m gy ip, vry dk gy-blk ip, lt gy ip, sl frm-sft, frm ip, tr sl hd, pred blk, amorph ip, n calc, micmica, tr slty, fd pyr

KOP @ 6,660'MD

See Zogol A 2H Horizontal log



JDC@6,500'MD

TG 6689u

KAH@6,500'MD

MD: 6,502'
 INC: 1.2
 AZM: 51.9

BG 280u

MD: 6,512'
 TVD: 6,503'
 INC: 1.2
 AZM: 51.9

G 376u

BG 350u

C

BG 380u

MD: 6,596'
 TVD: 6,587'
 INC: 1.1
 AZM: 80.2

C

BG 300u

MD: 6,659'
 TVD: 6,650'
 INC: 1.5
 AZM: 46