



WATERS PETROLEUM ADVISORS

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

Well Name: OCS-Y-2321 Burger J 001
Location: Posey 6912
License Number:
Spud Date: 7/30/2015
Surface Coordinates: LAT: N 71° 10' 24.029"
LONG: W 163° 28' 18.522"
Bottom Hole Coordinates: LAT: N 71° 10' 24.029"
LONG: W 163° 28' 18.522"
Ground Elevation (ft): 0 K.B. Elevation (ft): 76
Logged Interval (ft): 222 To: 6800 Total Depth (ft): 6800
Formation: Kuparuk C / Kuparuk A / Kuparuk D
Type of Drilling Fluid: Surface: Sea Water; Intermediate and Main Objective: KlaShield WBM
Region: Chukchi Sea, Alaska
Drilling Completed: 9/21/2015
Printed by STRIP.LOG from WellSight Systems 1-800-447-1534 www.WellSight.com

OPERATOR

Company: Shell Gulf of Mexico, Inc
Address: 200 North Dairy Ashford Rd
Houston, TX 77079

GEOLOGIST

Name: J. McBeth, R. Massey
Company: Waters Petroleum Advisors
Address: 4824 Potter Crest Circle
Anchorage, AK 99516
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Comments

Exploration
Rig: Polar Pioneer
API #: 55-352-00004-00
AFE #: 30230984

This log displays the LWD data in Recorded Mode

Casing/LOT

KB to Mudline: 222'

Mudline Cellar Floor: 255'

Water Depth: 146'

Surface:

8.5" Pilot hole to 1,512' MD

42" Pilot hole opener: 36" x 2" X65 set at 393' MD

22" 129.5 # X80, H90 casing @ 1475' MD / 1475' TVD; FIT to 210 psi w/ 10.0 ppg MW @ 1522' TVD=12.6 ppg EMW

Intermediate 1: 14" 114# L80 Vam Top KB casing @ 2,933' MD / 2,933' TVD; FIT to 451 psi w/ 14.0 ppg MW @ 2,973' TVD=14.0 ppg EMW

Intermediate 2: 9 5/8" 53.5# L80 Vam SLIJ-II casing @ 5,408' MD / 5,406' TVD; FIT to 907 psi w/ 12.07 ppg MW @ 5,408' TVD=15.28 ppg EMW

LWD

Pilot Hole (8.5" hole size):

BHA #1 Sensor Distances: DGR=6.67', PWD=9.49', PCDC=16.8', XBAT=32.85', ADR=59.89', ALD=79.17', CTN=92.13', MRIL=109.6'

Pilot Hole (26" hole size):

BHA #4 Sensor Distances: PCDC=123.78', PWD=133.7'

Intermediate 1 Hole (17-1/2" hole size):

BHA #5 Sensor distances: DIR=79.96', PWD=89.88'





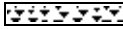
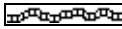




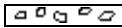

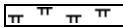


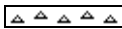



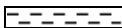

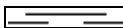

Intermediate 2 Hole (12-1/4" hole size)

BHA #6 Sensor distances: GR=37.22', EWR=45.42', DIR=56.82', PWD=70.67', ALD=87.77', CTN=106.44', XBAT=130.62'

Main Objective (8.5" hole size):

BHA #7 Sensor Distances: DGR=38.4', PWD=41.27', DIR=48.8', XBAT=64.79', ADR=95.88', ALD=113.16', CTN=126.09', MRIL=143.06'

ROCK TYPES

	Anhy		Coal		Lmst		Shcol		Tuff
	Bent		Congl		Meta		Shgy		Siderite
	Brec		Dol		Mrlst		Sltst		Cement
	Cht		Gyp		Salt		Ss		
	Clyst		Igne		Shale		Till		

PROPRIETARY

ACCESSORIES

- MINERAL**
- veins
 - Vertfrac
 - Slickens
 - ovgth
 - 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
- Inoceram

- Fault
- sidstrg
- Pebbly
- Clyst-strg
- Cong

- STRINGER**
- Anhy
 - Arg
 - Bent
 - Coal
 - Dol
 - Gyp
 - Ls
 - Mrst
 - Sltrstrg
 - Ssstrg
 - thincoal

- TEXTURE**
- Boundst
 - Chalky
 - Cryxln
 - Earthy
 - Finexln
 - Grainst
 - Lithogr
 - Microxln
 - Mudst
 - Packst
 - Wackest

OTHER SYMBOLS

- POROSITY**
- Earthy
 - Fenest
 - Fracture
 - Inter
 - Moldic
 - Organic
 - Pinpoint

- Vuggy
- SORTING**
- Well
 - Moderate
 - Poor

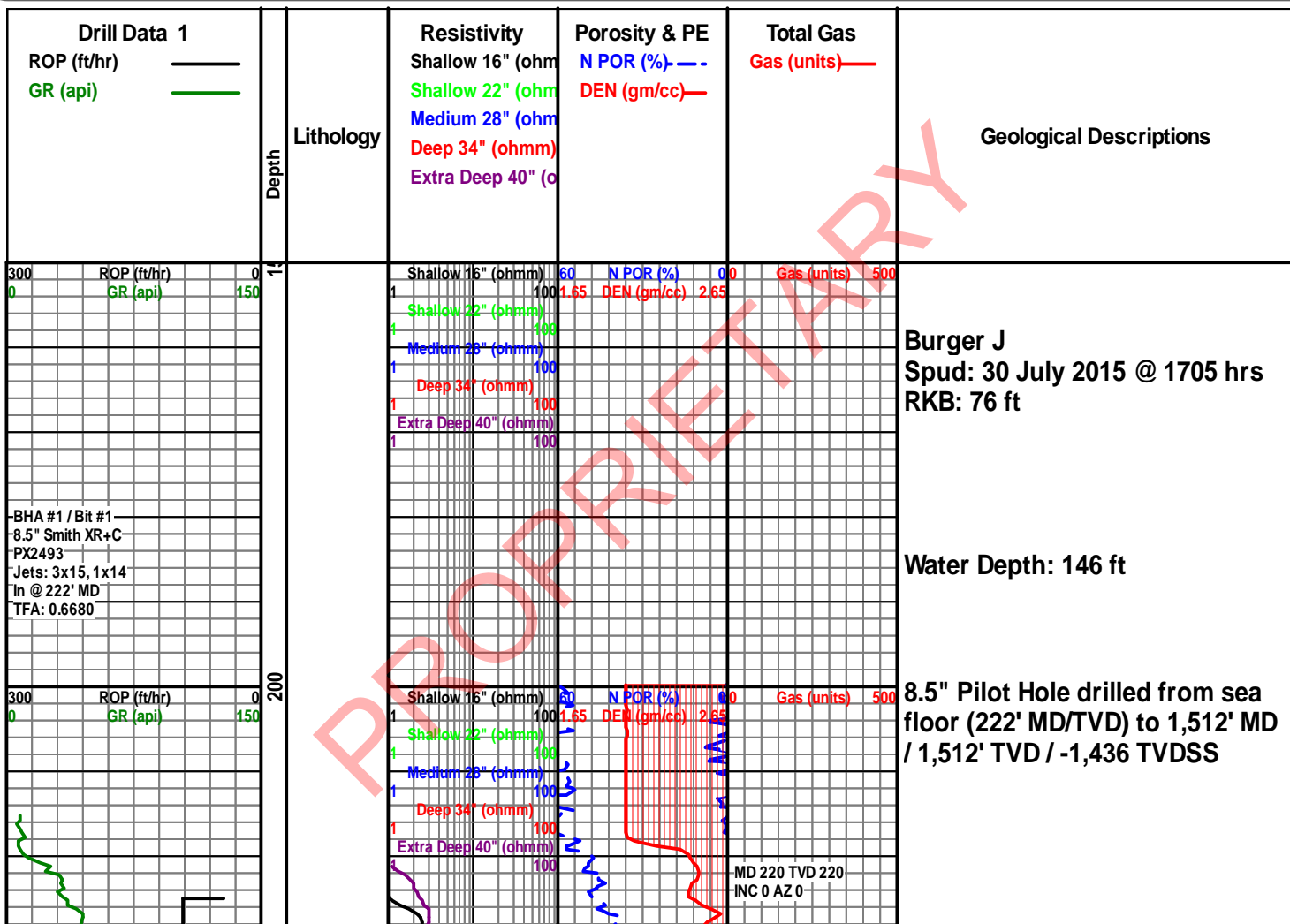
- ROUNDING**
- Rounded
 - Subrnd
 - Subang
 - Angular

- OIL SHOW**
- Even

- Spotted
- Ques
- Dead

- INTERVAL**
- Core
 - Dst

- EVENT**
- casingr
 - Rft
 - Sidewall
 - Bit
 - New symbol
 - Pipe conn



BHA #1 Sensor
 distances:
 Gamma: 6.67'
 PWD 9.49'
 Dir: 17.02'
 Sonic: 32.85'
 Res: 59.89'
 Den: 79.17'
 Por: 92.13'
 MRIL/NMR: 109.6'

250

300

350

400

ROP (ft/hr)
 GR (ppm)

Surface to
 2,760' MD
 NANUSHUK

Mud Wt: Sea Water
 (8.57 ppg)

36" Hole opener then drilled
 from sea floor (222' MD/TVD) to
 384' MD/TVD / -308' TVDSS

Mud line cellar bit then drilled
 from sea floor to 257' MD/TVD /
 -181' TVDSS

42" Hole opener then drilled
 from 257' MD /TVD to 393'
 MD/TVD / -317' TVDSS

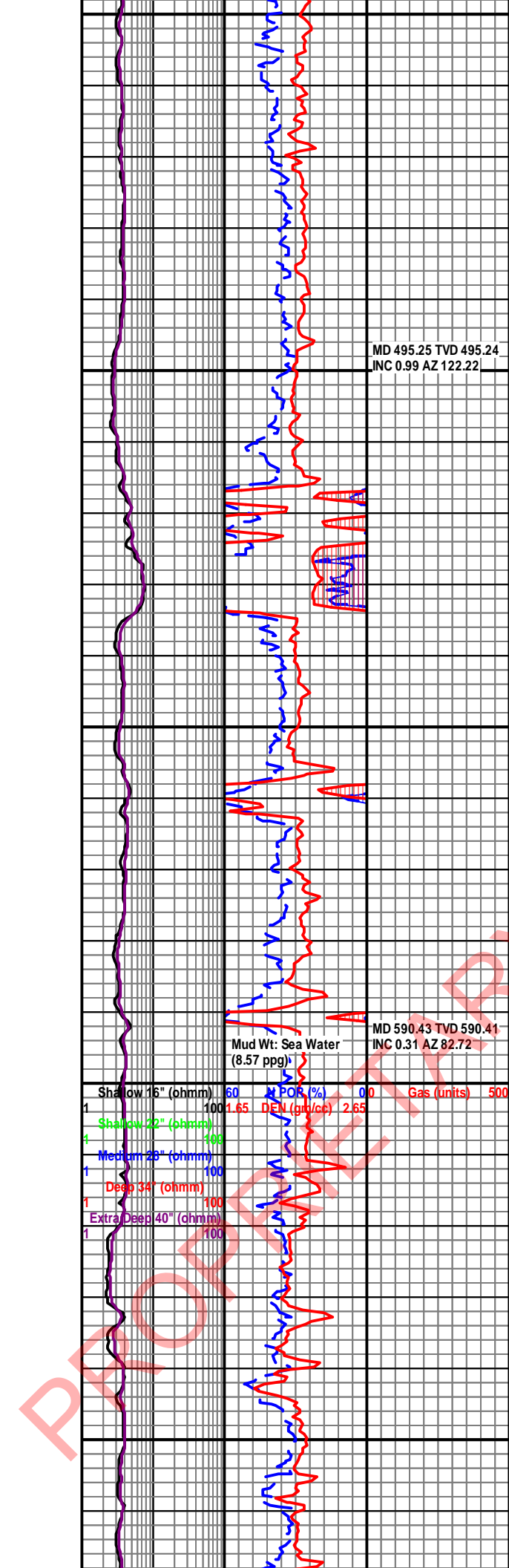
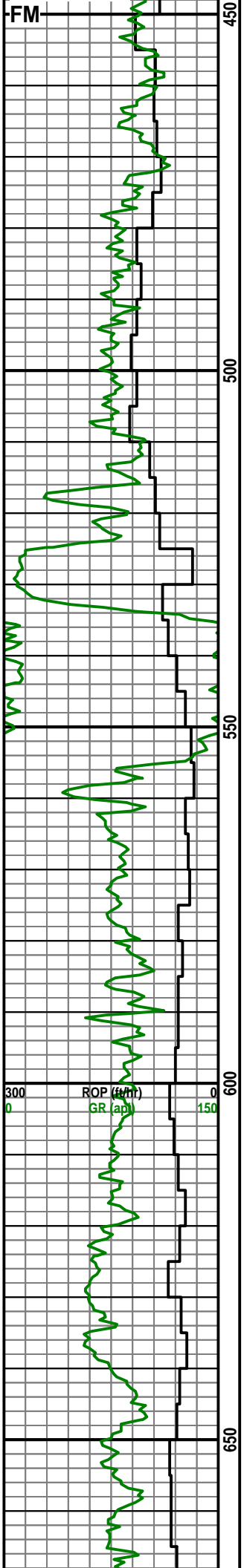
MD 320.88 TVD 320.88
 INC 0.51 AZ 129.6

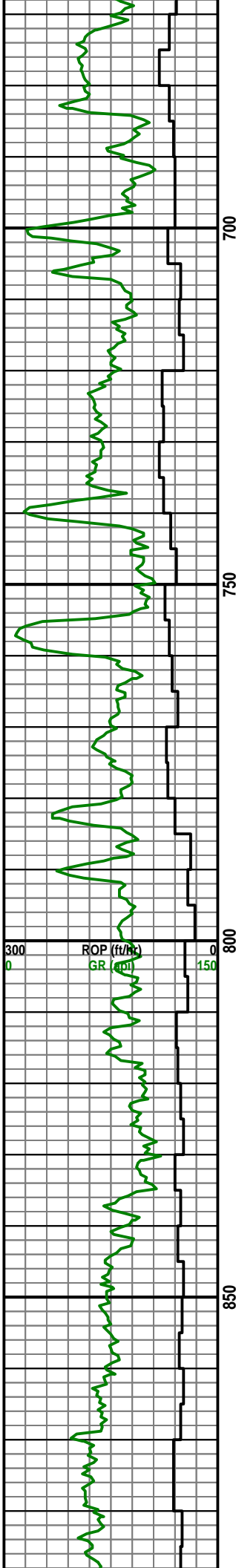
36" Casing/Conductor set at 375'
 MD / 375' TVD / -299' TVDSS

26" Hole opener then drilled
 from 375' MD/TVD to 1,512' MD /
 1,512' TVD / -1,436 TVDSS

Shallow 16" (ohmm)	60	POI (%)	0.0	Gas (units)	500
Shallow 22" (ohmm)	100	POI (gm/cc)	2.65		
Medium 28" (ohmm)	100				
Deep 34" (ohmm)	100				
Extra Deep 40" (ohmm)	100				

MD 406.77 TVD 406.76
 INC 0.31 AZ 89.93





700

750

800

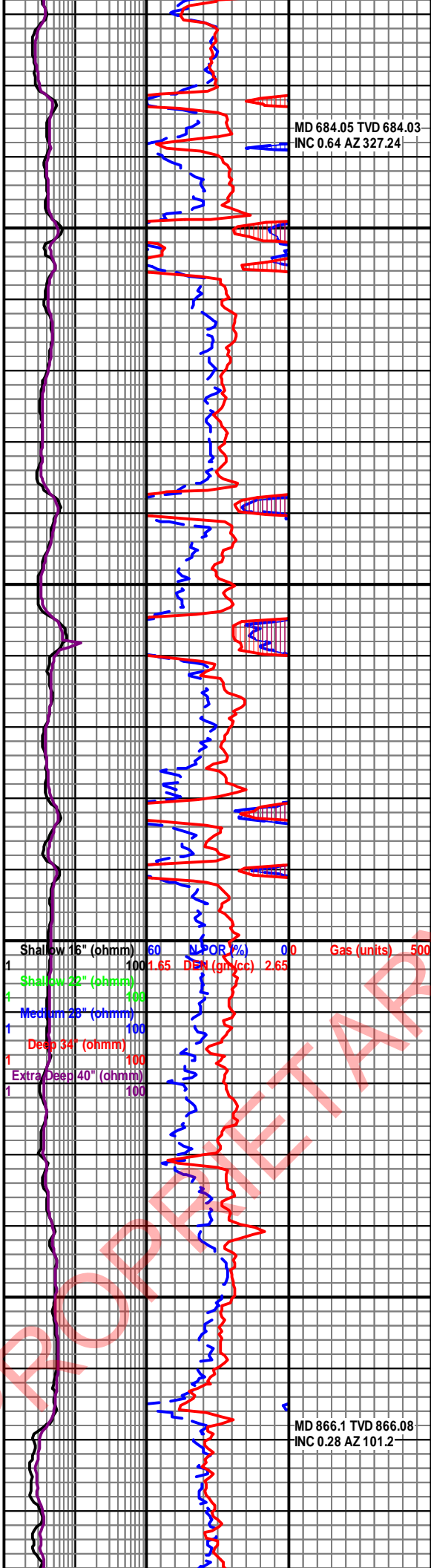
850

300
0

ROP (ft/hr)

GR (ppm)

0 150

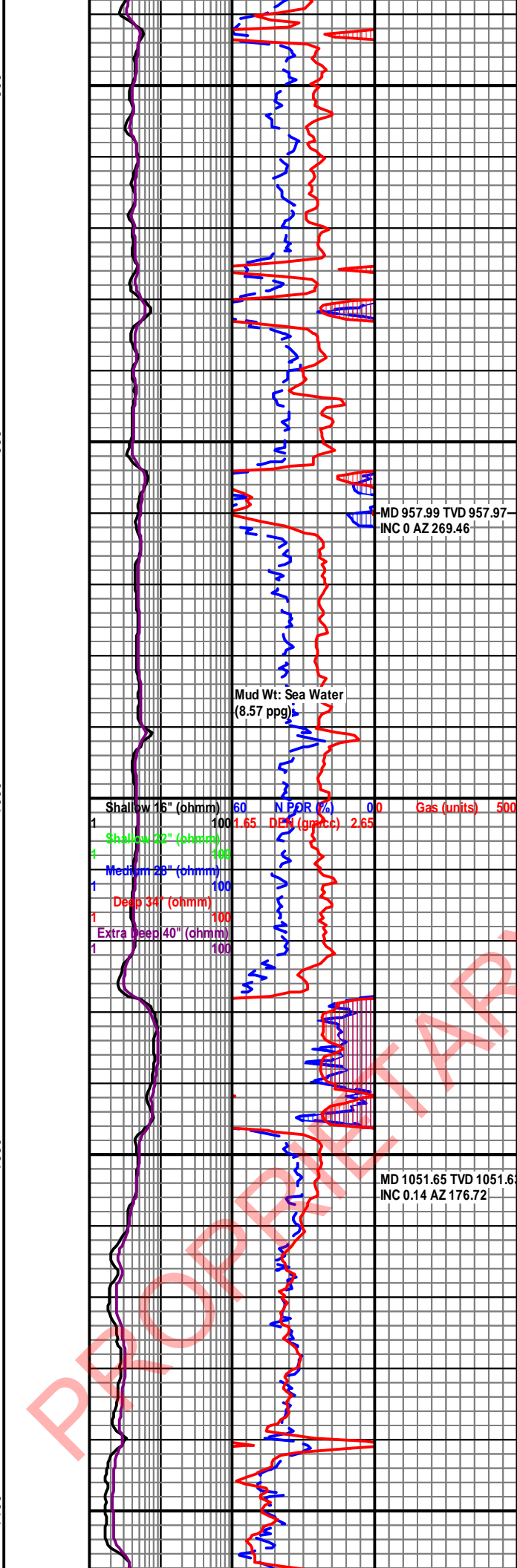
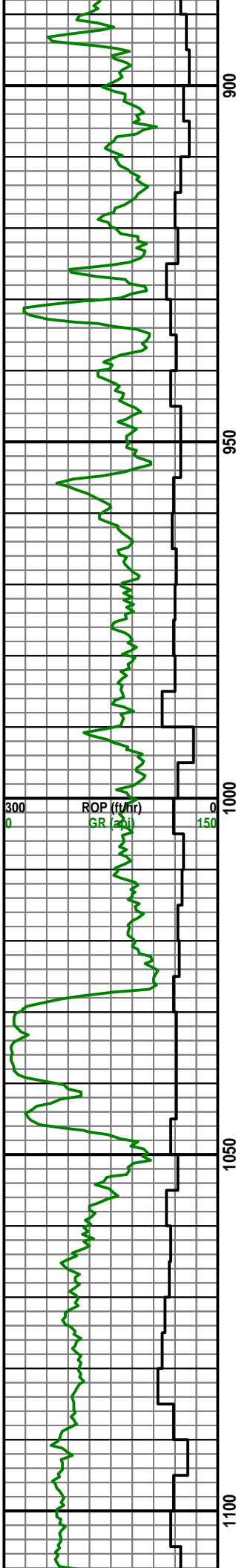


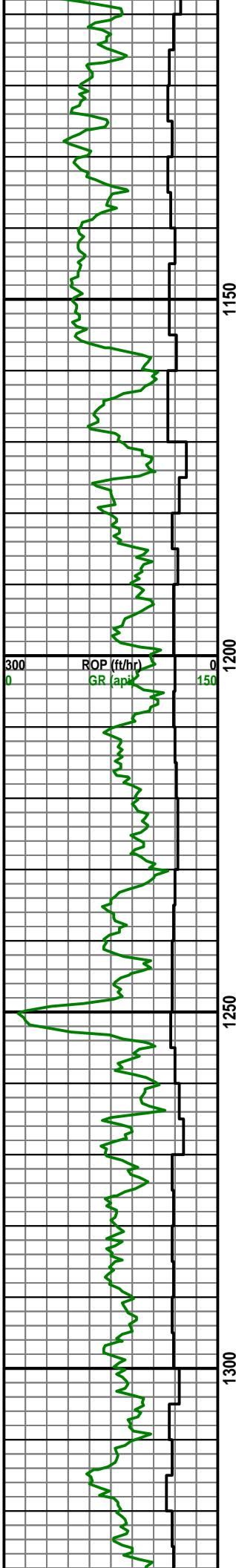
MD 684.05 TVD 684.03
INC 0.64 AZ 327.24

Shallow 16" (ohmm)	60	N POR %	0.0	Gas (units)	500
1	100	1.65	DEW (ph/cc)	2.65	
Shallow 22" (ohmm)	100				
4	100				
Medium 28" (ohmm)	100				
1	100				
Deep 34" (ohmm)	100				
1	100				
Extra Deep 40" (ohmm)	100				
1	100				

MD 866.1 TVD 866.08
INC 0.28 AZ 101.2

PROPERTY





1150

1200

1250

1300

MD 1144.54 TVD 1144.54
INC 0.26 AZ 120.65

Shallow 16" (ohmm)	60	ROR (%)	0.0	Gas (units)	500
1	100	1.65	DEM (ppm-c)	2.65	
Shallow 22" (ohmm)	100				
4	100				
Medium 28" (ohmm)	100				
1	100				
Deep 34" (ohmm)	100				
1	100				
Extra Deep 40" (ohmm)	100				
1	100				

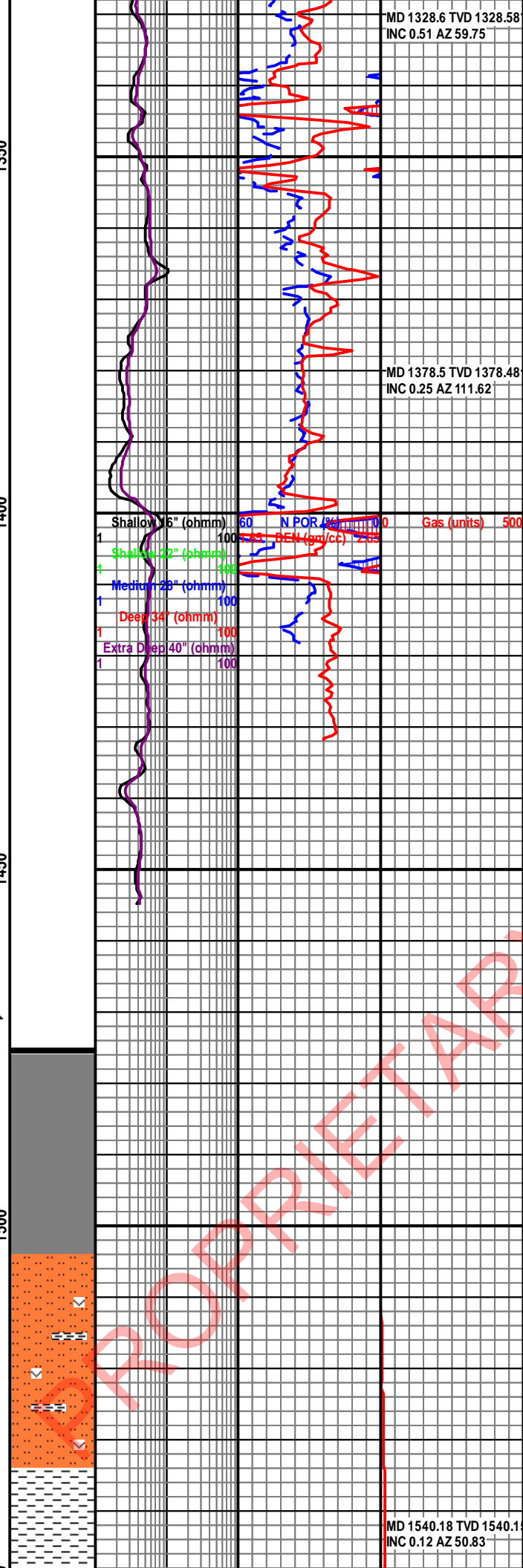
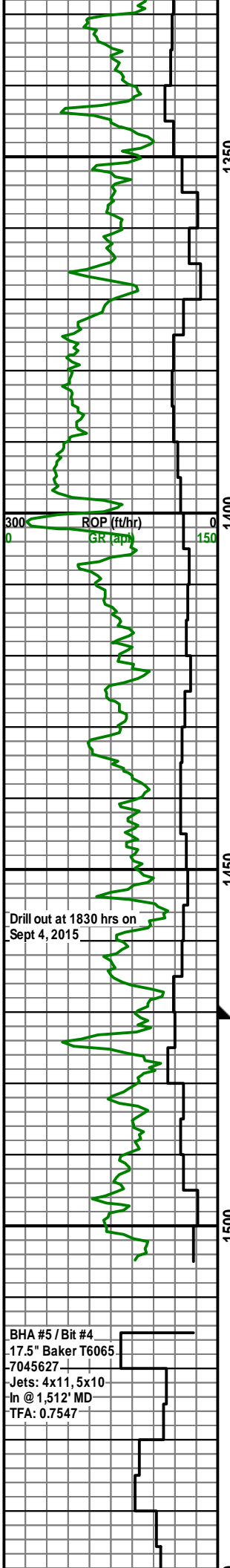
MD 1235.66 TVD 1235.66
INC 0.41 AZ 134.11

Mud Wt: Sea Water
(8.57 ppg)

PROPERTY

MD 1328.6 TVD 1328.58
INC 0.51 AZ 59.75

MD 1378.5 TVD 1378.48
INC 0.25 AZ 111.62



Drill out at 1830 hrs on Sept 4, 2015

22" Surface Casing set at 1,475'
MD / 1,475' TVD / -1,399' TVDSS

BHA #5 / Bit #4
17.5" Baker T6065
7045627
Jets: 4x11, 5x10
In @ 1,512' MD
TFA: 0.7547



1500'-1530' SLTST 70% lt-med gy wi com wh-lt gy tuf mtx, arg, sft, easily fri; CLYST 30% med gy, sft, fri, fri

1530'-1560' CLYST 100% med gy, stiff-mushy, cohesive, sft, sm

MD 1540.18 TVD 1540.1
INC 0.12 AZ 50.83

PROPRIETARY

BHA #5 Sensor
distances:
Dir: 79.96'
PWD 89.88'

Mud Wt: 10 ppg
FV: 54 sec/qt
PV/YP: 15/20
Gels: 8/10/10
600/300: 50/35
WL: 4.7
pH: 9.2

1560'-1590' CLYST 100% med gy, Impy-mushy, sft, ireg cuttings habit, sm-sltyhabit, sm-slty

1590'-1620' CLYST 100% med gy, Impy-mushy, sl adhesive, ireg cuttings habit, sm, tr coalit, sm, tr coal

1620'-1650' CLYST 100% med gy, Impy-mushy, sft, mostly pulverulent, ireg cuttings habit, sm, tr tuffigs habit, sm, tr tuff

1650'-1680' CLYST 100% med gy, Impy-mushy, sft, mostly pulverulent, ireg cuttings habit, sm cuttings habit, sm

1680'-1710' CLYST 100% med gy, Impy-non-cohesive, pulverulent

1710'- 1740' No Sample

1740'- 1770' No Sample

300 ROP (ft/hr)
0 GR (api)

1600

Shallow 16" (ohmm)	60	N POR (%)	0	Gas (units)	500
1	100	1.65	DEN (gm/cc)	2.65	
Shallow 22" (ohmm)	100				
4	100				
Medium 28" (ohmm)	1				
1	100				
Deep 34" (ohmm)	1				
1	100				
Extra Deep 40" (ohmm)	1				
1	100				

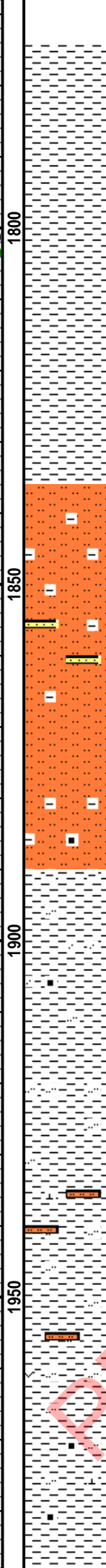
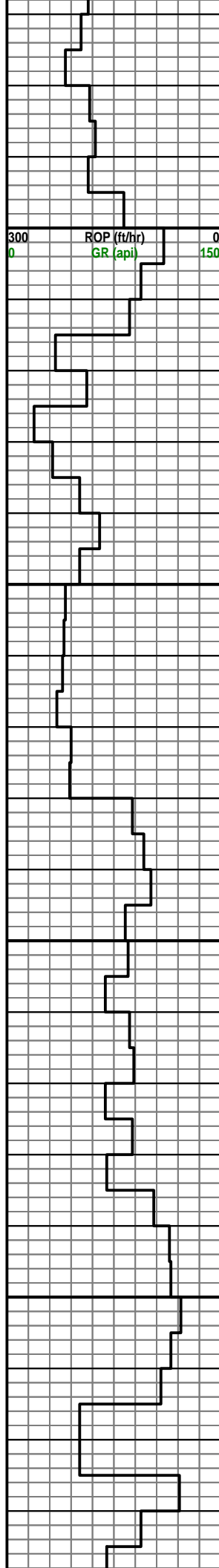
1650

1700

1750

MD 1723.74 TVD 1723.7
INC 0.39 AZ 34.99

PROPRIETARY



Shallow 16" (ohmm)	60	N POR (%)	0	Gas (units)	500
Shallow 22" (ohmm)	100	DEN (gm/cc)	2.65		
Medium 28" (ohmm)	100				
Deep 34" (ohmm)	100				
Extra Deep 40" (ohmm)	100				

MD 1818.58 TVD 1818.58
INC 0.58 AZ 50.01

1770'-1800' CLYST 100% med gy wi tr lt gy, Impy-mushy, easily fri, blk, sm-wxy

1800'-1830' CLYST 100% med gy, mushy-malleable, slty, easily fri, com blk

1830'-1860' SLTST 90% med-lt gy, easily fri, arg; SS 10% lt gy, l f-u vf, calc cmt, w srt

1860'-1890' SLTST 95% med gy, easily fri, arg, occlly carb; SS 5% lt gy, l f-u vf, sl calc, w srtv srt

1890'-1920' CLYST 60% med gy, sft, rthy, crumbly; SLTST 40% lt gy, occlly mica, sl calc

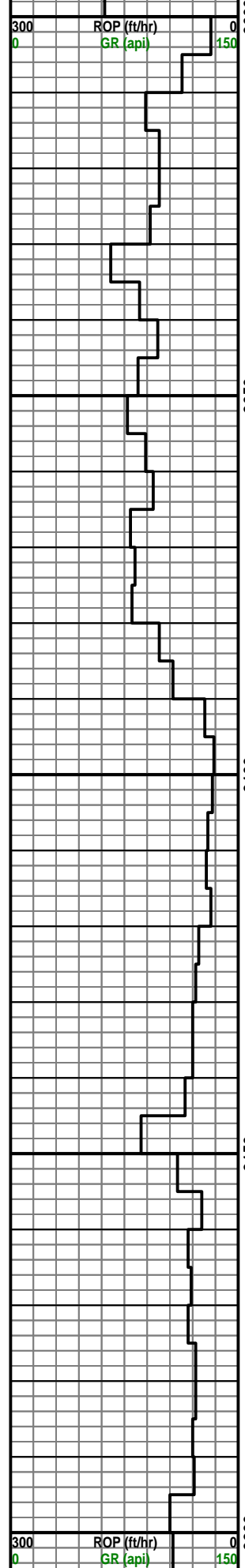
1920'-1950' CLYST 80% lt-med gy, sft frm, blk, sm, non calc; SLTST 20% lt gy, frm, non calc, tr tuff

1950'-1980' CLYST 85% lt-med gy, sft-occlly frm, occlly rthy, amor; SLTST 15% lt gy, frm, sl calc, com carb mat

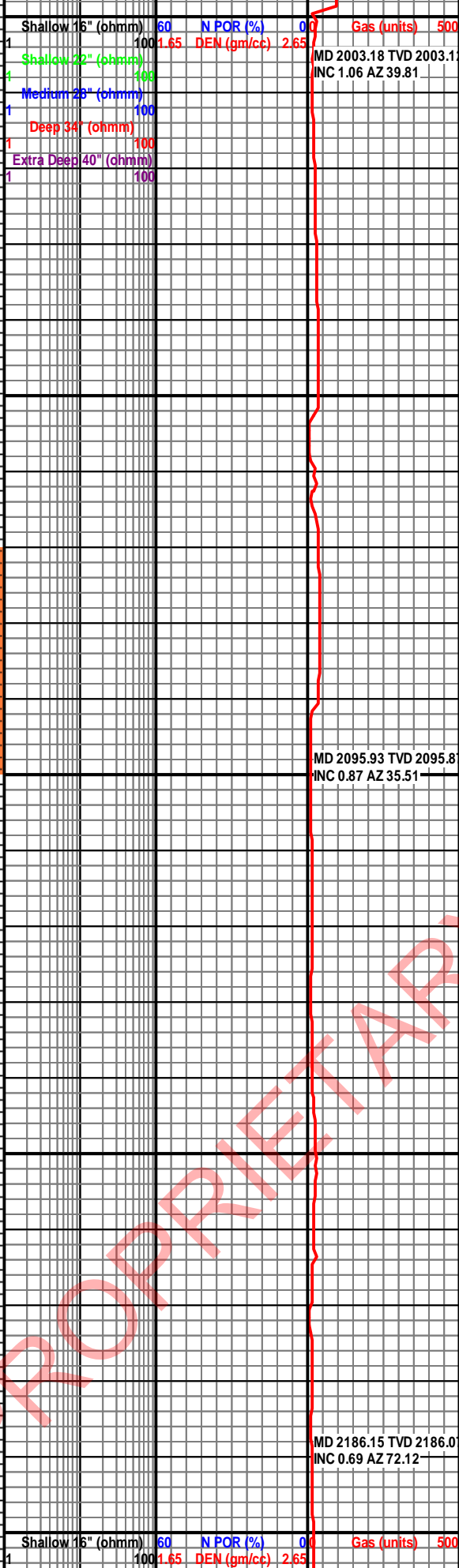
1980'-2010' CLYST 80% med gy, Impy-mushy, sft, easily fri; LS 20% crm-tan-dk gy, grds

PROPRIETARY

fri-frm-hd, amor-rthy, vf, rr dol, rr cht nodule



2000
2050
2100
2150
2200



Shallow 16" (ohmm) 60 N POR (%) 0.0 Gas (units) 500
 1 100 1.65 DEN (gm/cc) 2.65
 Shallow 22" (ohmm) 100
 4 100
 Medium 28" (ohmm) 100
 1 100
 Deep 34" (ohmm) 100
 1 100
 Extra Deep 40" (ohmm) 100
 1 100

MD 2003.18 TVD 2003.1
 INC 1.06 AZ 39.81

2010'-2040' CLYST 85% med gy, sft, easily fri;
 LS 15% tan-dk gy, grds frm-hd, amor-rthy, vf,
 rr dol, rr cht nodule

2040'-2070' CLYST 95% med gy, fri, sft-frm,
 rthy, carb; LS 5% tan-lt gy, frm-hd, rthy, mudst,
 vf, rr dol

2070'-2100' SLTST 70% lt gy-med gy, fri, frm,
 carb, arg; CLYST 30% med gy, rthy, sft,
 mushy, fragile, sl calc

MD 2095.93 TVD 2095.8
 INC 0.87 AZ 35.51

2100'-2130' CLYST 90% lt gy, frm-sft, rthy, slty,
 rr vf l sd grs, non calc; SLTST 10% lt gy, frm,
 non calc calc

2130'-2160' CLYST 100% lt gy-med gy, sft-frm,
 rthy, slty, carb non calc

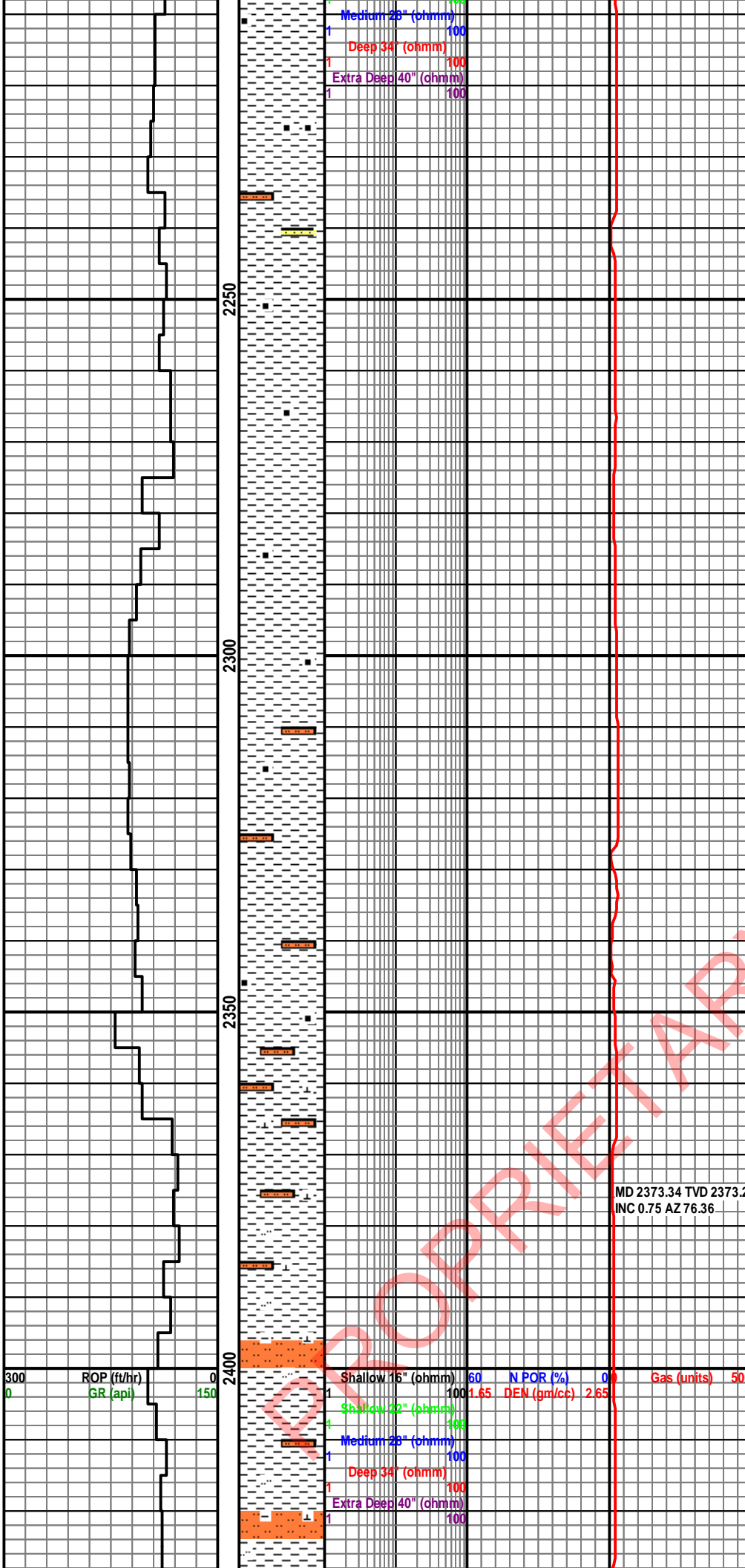
2160'-2190' CLYST 100% lt gy-gy, frm, fragile,
 blk, sm, sl slty

MD 2186.15 TVD 2186.0
 INC 0.69 AZ 72.12

2190'-2220' CLYST 100% lt gy-gy, frm, blk,
 sm, sl slty, sl carb, sl calc

Shallow 16" (ohmm) 60 N POR (%) 0.0 Gas (units) 500
 1 100 1.65 DEN (gm/cc) 2.65
 Shallow 22" (ohmm) 100
 4 100

PROPRIETARY



2220'-2250' CLYST 100% lt gy-med gy, frm, blky, slty ip, carb, sl calc, tr vf grn sd

2250'-2280' CLYST 100% lt gy-med gy, frm, blky, slty ip, sl carb, sl calc

2280'-2310' CLYST 100% med gy, frm, blky-plty, sm, incrg slt, carb, non calc

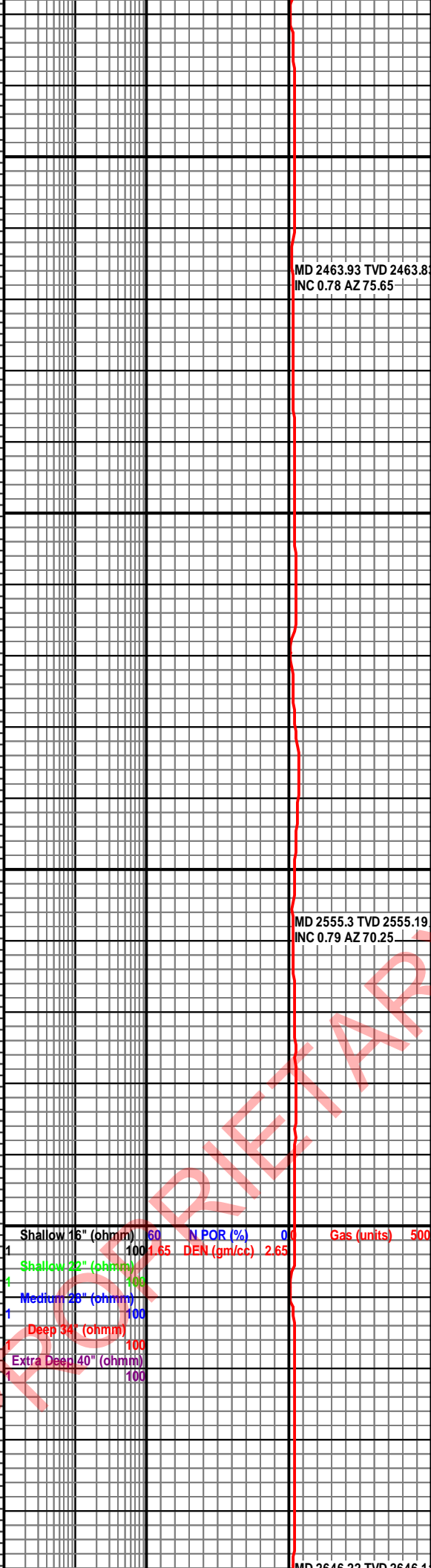
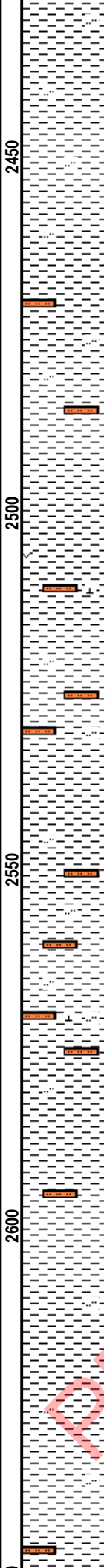
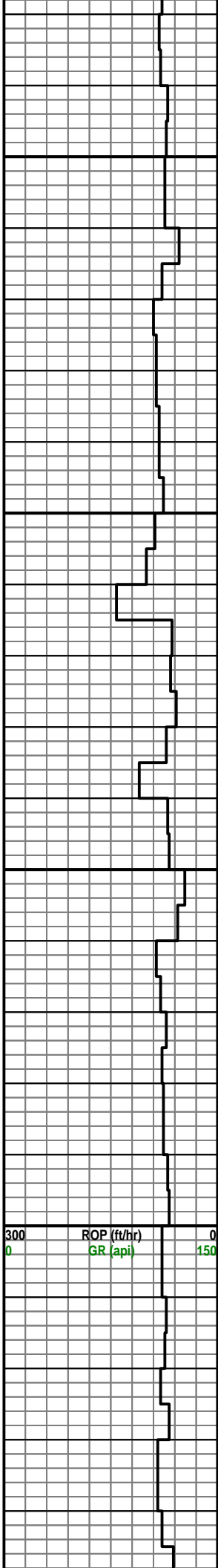
2310'-2340' CLYST 90% med gy, frm, blky, carb, slty; SLTST 10% lt gy, frm, fragile, nodr

2340'-2370' CLYST 85% med gy, frm, blky, slty, carb, slty; SLTST 15% lt gy, frm, fragile, nodr, tr lsr, tr ls

2370'-2400' CLYST 70% med gy-lt gy, fri-frm, blky, slty; SLTST 30% lt gy, fri, nodr, sl calc mtx

2400'-2430' CLYST 60% med gy-lt gy, fri-frm, blky, slty; SLTST 40% med gy wi tr lt brn, fri, nodr, sl calc mtx

PROPRIETARY



2430'-2460' CLYST 100% med gy wi tr lt gy, fri-frm, blk-ym, tr slty, PDC bit curling

2460'-2490' CLYST 80% med-lt gy, fri-frm, blk-ym, slty, PDC bit curling; SLTST 20% lt gy, fri, nodr nodr
 MD 2463.93 TVD 2463.8
 INC 0.78 AZ 75.65

2490'-2520' CLYST 70% med-lt gy, fri, blk-ym, slty, PDC bit curling; SLTST 30% lt gy, fri, nodr, tr tuf mtx, tr calc mtx

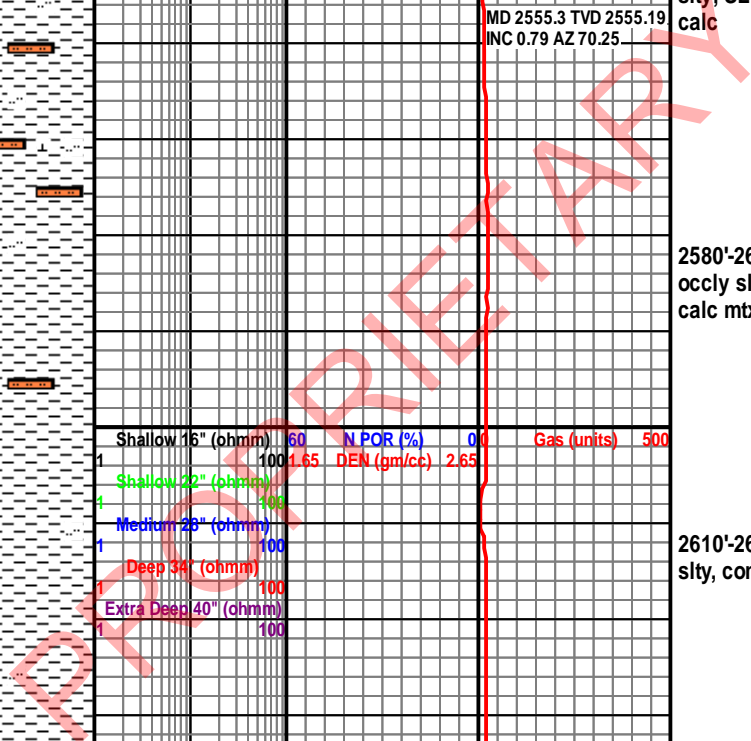
2520'-2550' CLYST 70% med-lt gy, fri, blk-ym, slty, PDC bit curling; SLTST 30% lt gy, fri, nodr, tr sl calc

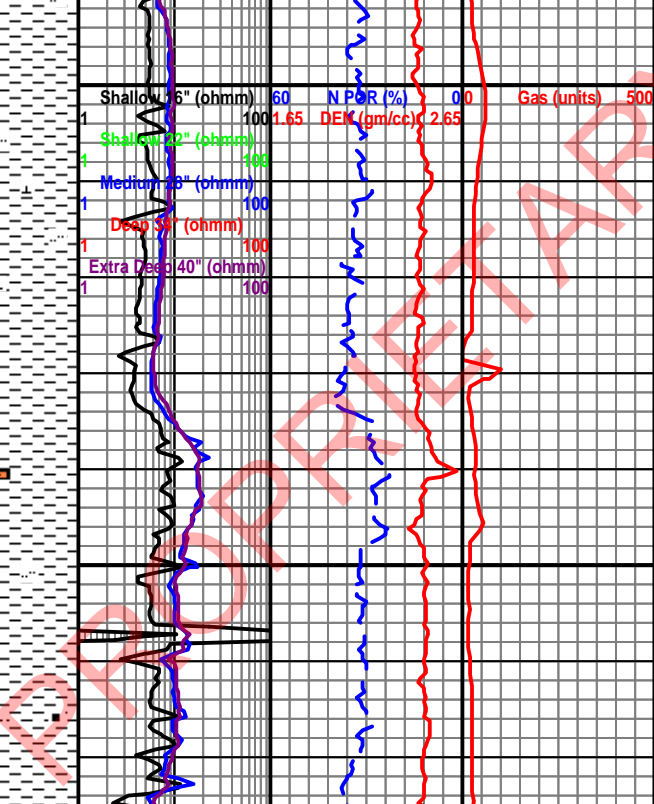
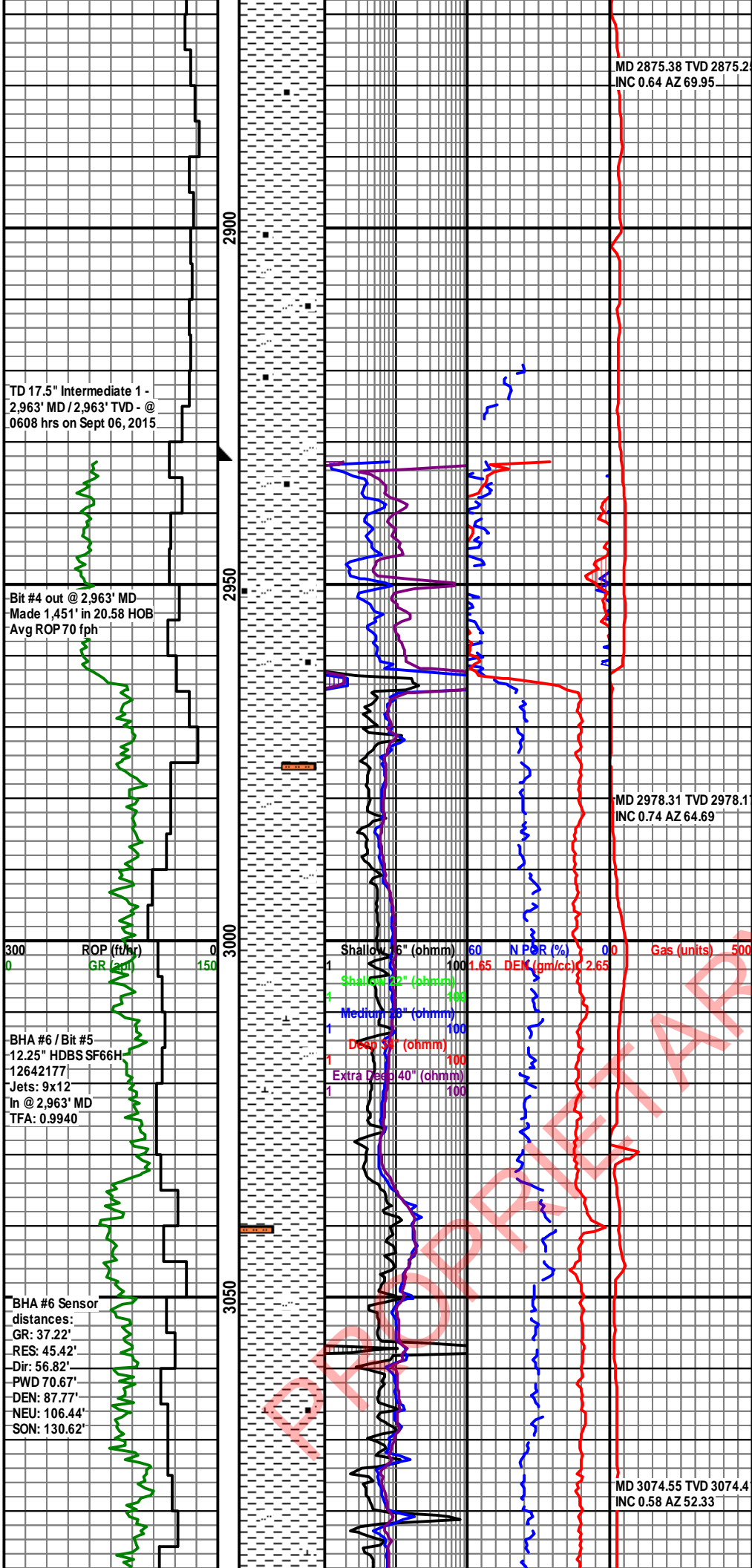
2550'-2580' CLYST 60% med-lt gy, fri, blk-ym, slty; SLTST 40% lt gy, fri-frm, tab, arg, tr sl calc
 MD 2555.3 TVD 2555.19
 INC 0.79 AZ 70.25

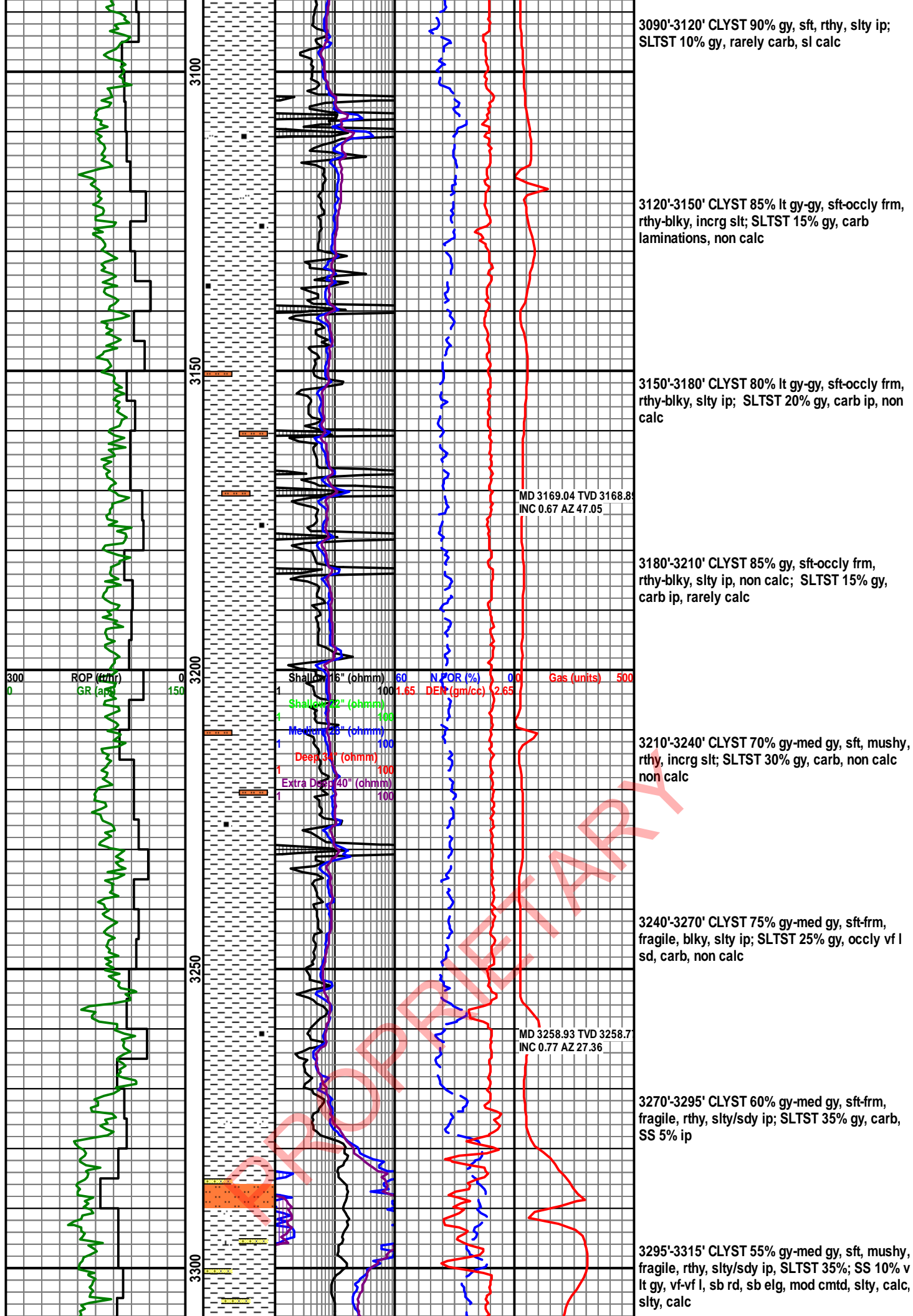
2580'-2610' CLYST 90% med-lt gy, fri, blk-ym, occl-ym slty; SLTST 10% lt gy, fri-frm, arg, rr 1, calc mtx/c mtx

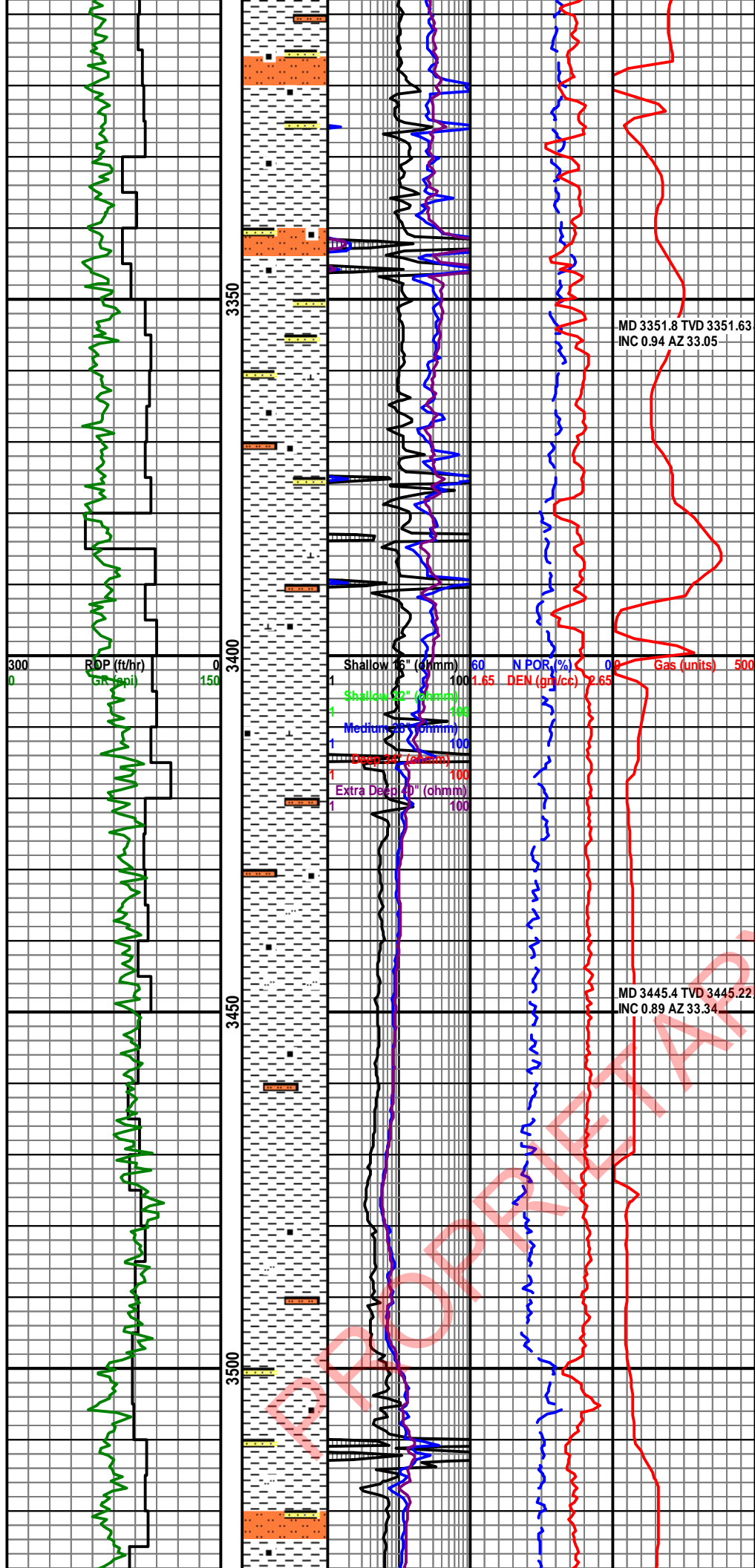
2610'-2640' CLYST 100% med gy, fri-frm, blk-ym, slty, com PDC bit curling

2640'-2670' CLYST 60% med gy, frm-fri, blk-ym, occl-ym slty, tr butter curling, rr calc; SLTST ;
 40% lt-med gy, slty, fri-frm, moderate arg-slty
 MD 2646.22 TVD 2646.1









3315'-3330' SLTST 40%; SS 20% v lt gy, vfg, sb rd, sb elg, mod cmt, slty, sl calc CLYST 40% med gy, sft, mushy, fragile, rthy, slty/sdy ip,

3330'-3360' CLYST 35% gy-med gy, sft, fragile; SLTST 40% lt gy-gy; SS 25% v lt gy, vfg, sb rd-sb ang, sb elg, mod cmt, slty, sl calc sl calc

3360'-3390' CLYST 40% med gy-dk gy, sft-occlly frm, mushy, fragile; SLTST 40% lt gy-gy; SS 20% lt gy, vfg, sb rd, sb elg, mod cmt, slty, increasingly carb, sl calc

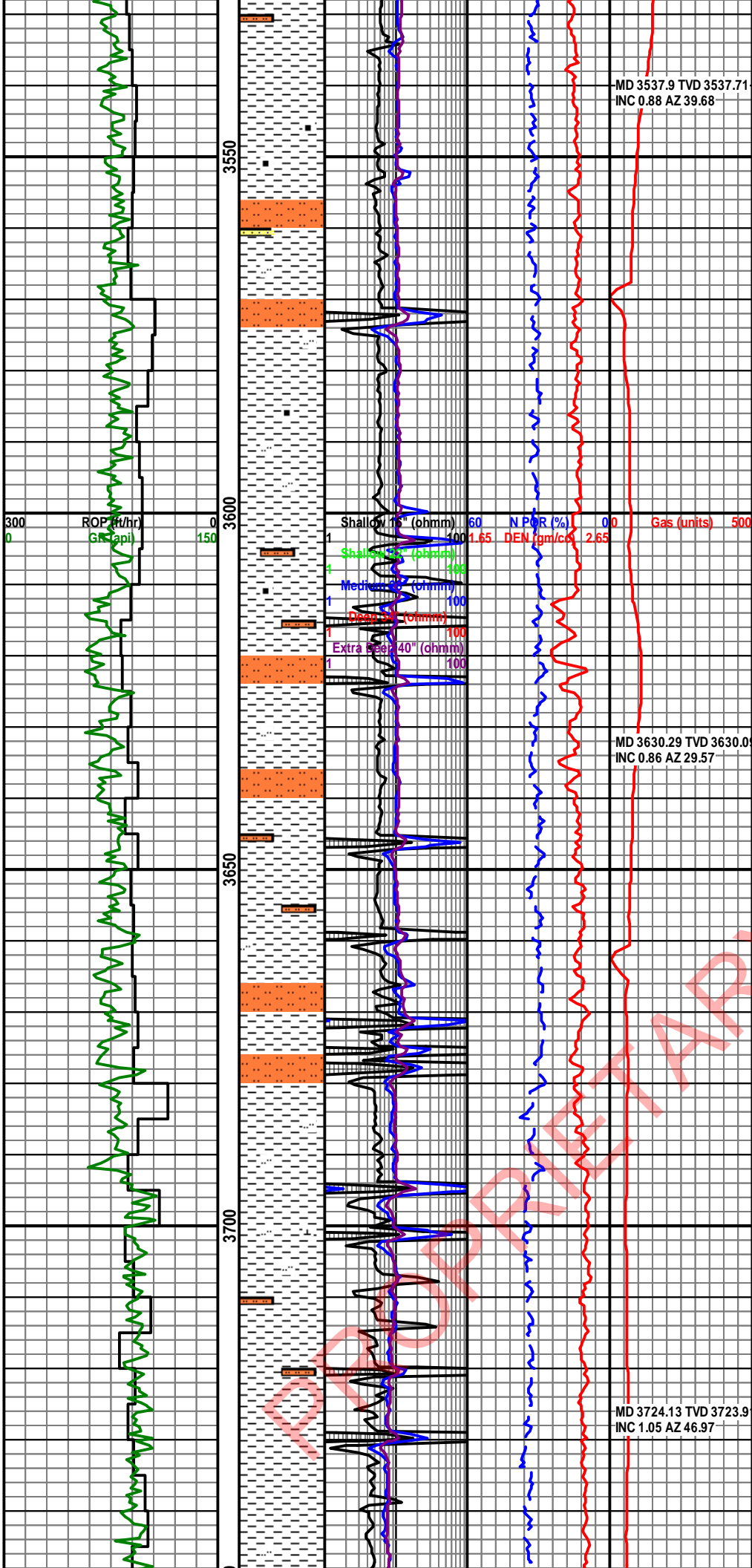
3390'-3420' CLYST 40% med gy, sft-occlly frm, fragile; SLTST 30% gy, carb; SS 30% lt gy-gy, vfg, sb rd-sb ang, sb elg, mod-g calc cmt

3420'-3450' CLYST 60% gy-med gy, sft-occlly frm, mushy, fragile, SLTST 40% gy, carb, rr vf grn sd

3450'-3480' CLYST 85% gy, sft, fragile, sl fis, non calc, slty; SLTST 15% gy, frm, fragile, carb, sl calc

3480'-3510' CLYST 80% lt gy-gy, sft, fragile, mushy, occlly frm, non calc; SS 20% v lt gy-lt gy, vf grn, sb ang, w srt, calc cmt, carb

3510'-3540' CLYST 80% med lt gy-med gy, sft, fragile, mushy, occlly frm, non calc; SLTST 10% gy, frm, fragile, carb, sl calc; SS 10% v lt gy-lt gy, vf grn, sb ang, w srt, calc cmt, carb



3540'- 3570' CLYST 75% med lt gy-med gy, sft frm, fragile, blk y ip, calc, SLTST 25% lt gy-gy, frm, fragile, carb

3570'-3600' CLYST 90% med lt gy-med gy, blk y, sl calc; SLTST 10% gy, frm, fragile, decrng carb mat

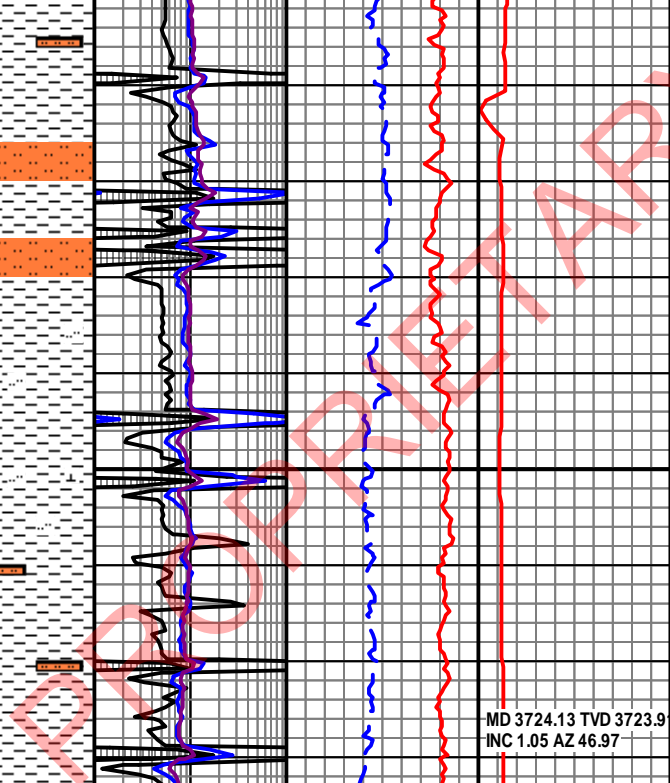
3600'-3630' SLTST 40% lt gy-med gy, sft, fragile, carb laminations, occ f grn sd, sl calc; CLYST 60% med lt gy-med gy, blk y, sl calc

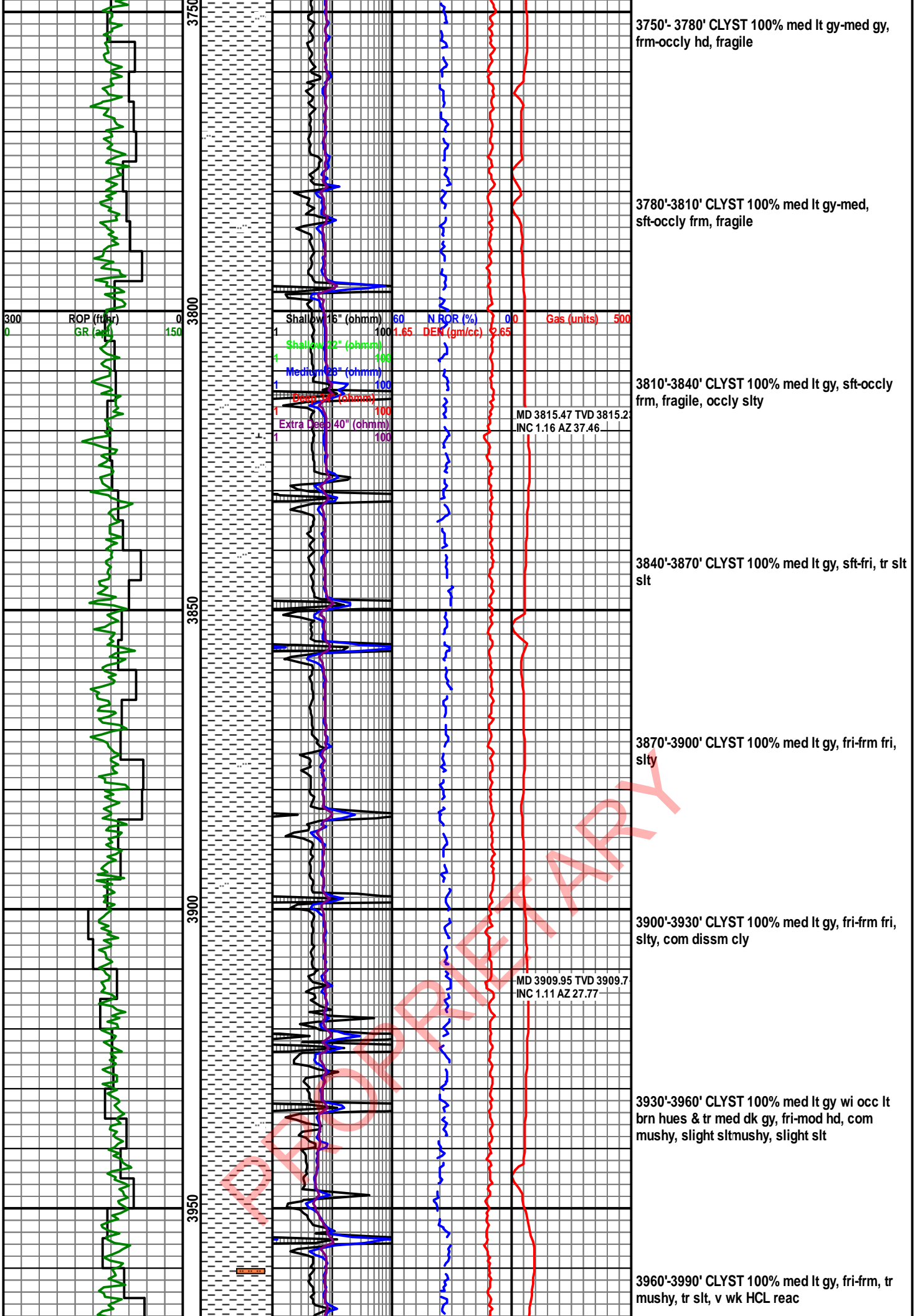
3630'- 3660' CLYST 65% med lt gy-med gy, sft frm, fragile, blk y ip, rr SH cutting; calc, SLTST 35% lt gy-gy, frm, fragile, carb

3660'- 3690' SLTST 35% lt gy-med gy, sft, fragile, decrng carb mat; CLYST 65% lt gy-med gy, sft, frm, fragile

3690'-3720' CLYST 100% med gy, sft, fragile, calc, sl slty

3720'- 3750' CLYST 100% med lt gy-med gy, frm, fragile, calc, sl slty





3750'- 3780' CLYST 100% med lt gy-med gy, frm-occly hd, fragile

3780'-3810' CLYST 100% med lt gy-med, sft-occly frm, fragile

300 ROP (ft/hr) 0 GR (g/cc) 150

Shallow 16" (ohmm) 60 N ROR (%) 0.0 Gas (units) 500
 1 100 1.65 DEN (gm/cc) 2.65
 Shallow 22" (ohmm) 108
 4 100
 Medium 28" (ohmm) 100
 1 100
 Extra Deep 34" (ohmm) 100
 1 100

3810'-3840' CLYST 100% med lt gy, sft-occly frm, fragile, occlly slty

MD 3815.47 TVD 3815.2
 INC 1.16 AZ 37.46

3840'-3870' CLYST 100% med lt gy, sft-fri, tr slt slt

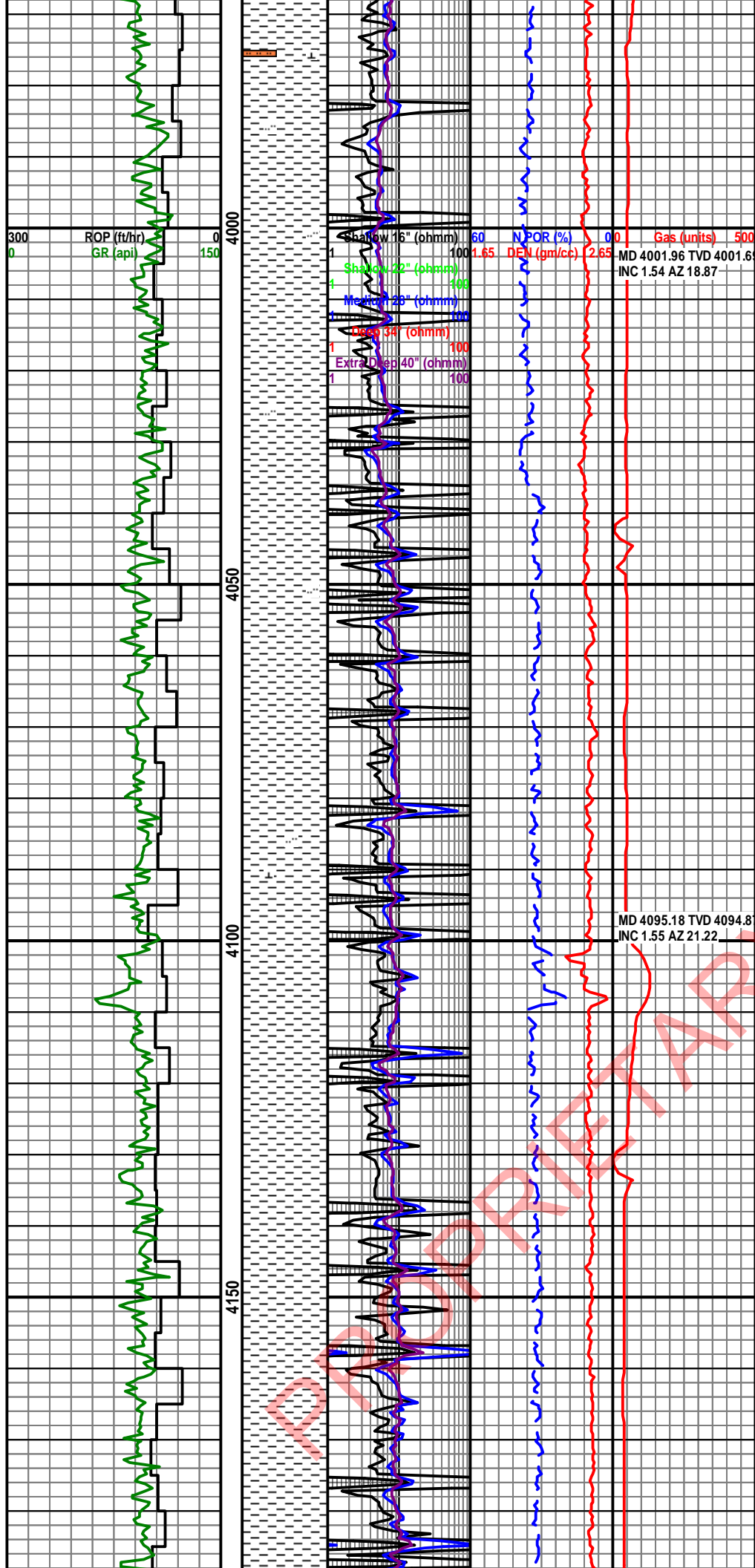
3870'-3900' CLYST 100% med lt gy, fri-fri fri, slty

3900'-3930' CLYST 100% med lt gy, fri-fri fri, slty, com diss mly

MD 3909.95 TVD 3909.7
 INC 1.11 AZ 27.77

3930'-3960' CLYST 100% med lt gy wi occ lt brn hues & tr med dk gy, fri-mod hd, com mushy, slight sltmushy, slight slt

3960'-3990' CLYST 100% med lt gy, fri-fri, tr mushy, tr slt, v wk HCL reac



3990'-4020' CLYST 100% med lt gy wi occ lt brn hues & tr med dk gy, fri-mod hd, tr mushy, com slt hd, tr mushy, com slt

60 N-POR (%) 0.0 Gas (units) 500
 100 1.65 DEN (gm/cc) 2.65 MD 4001.96 TVD 4001.6
 4 Shallow 16" (ohmm) 100
 4 Medium 20" (ohmm) 100
 1 Deep 34" (ohmm) 100
 1 Extra Deep 40" (ohmm) 100

4020'-4050' CLYST 100% med lt gy wi com lt brn hues & tr hd med dk gy frags, sft-fri wi tr mod hd sltst, tr mushy-dissm

4050'-4080' CLYST 100% med gy wi diss m lt brn cly, sft-easily fri, blk-y-tab, tr slt

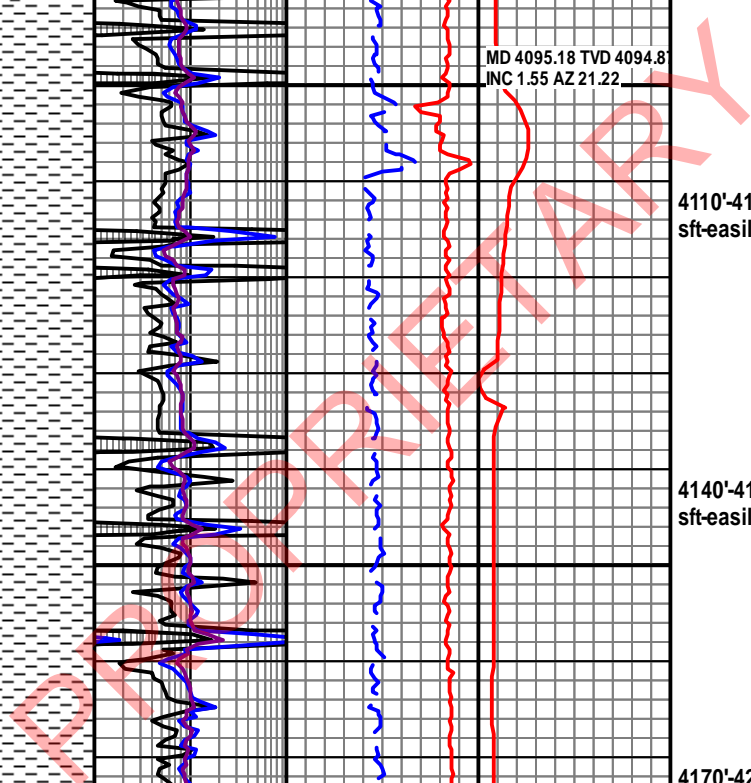
4080'-4110' CLYST 100% med gy, mushy, sft-easily fri, tr PDC cuttings habit, rr calc slt

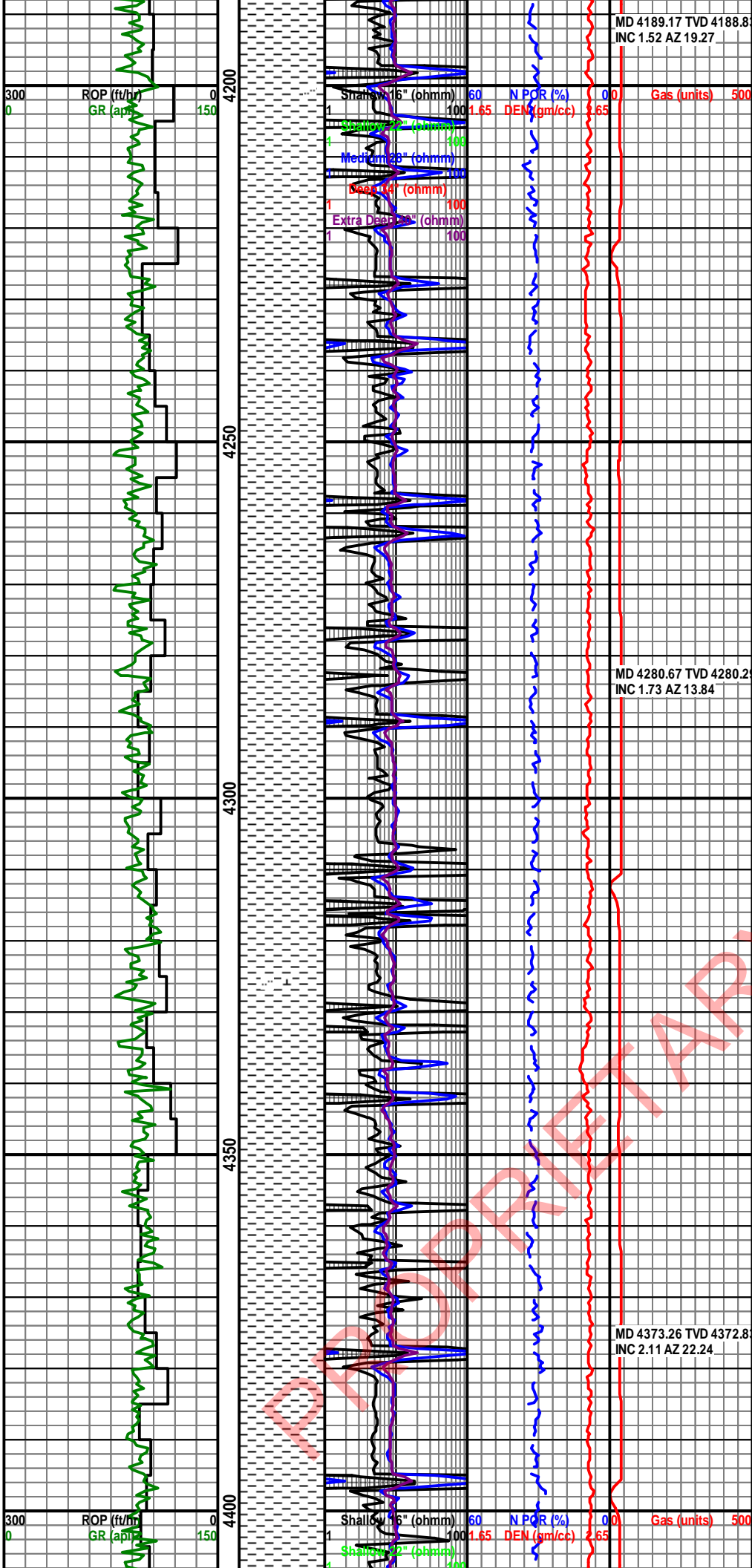
MD 4095.18 TVD 4094.8
INC 1.55 AZ 21.22

4110'-4140' CLYST 100% med gy, mushy, sft-easily fri, rr calc slt

4140'-4170' CLYST 100% med gy, mushy, sft-easily fri, tr PDC cuttings habit

4170'-4200' CLYST 100% med gy, mushy, sft-easily fri, fr amt diss m cly





MD 4189.17 TVD 4188.8
INC 1.52 AZ 19.27

4200'-4230' CLYST 100% med gy, sft-easily fri, mushy, rr slit slit

4230'-4260' CLYST 100% med gy, mushy, sft-easily fri, fr amt PDC cuttings habit, com amor

4260'-4290' CLYST 100% med gy, sft-fri fri, blk, tr PDC cuttings habit, sl slty

MD 4280.67 TVD 4280.2
INC 1.73 AZ 13.84

4290'-4320' CLYST 100% med gy, frm-fri, blk, tr PDC cuttings habit, tr calc slst

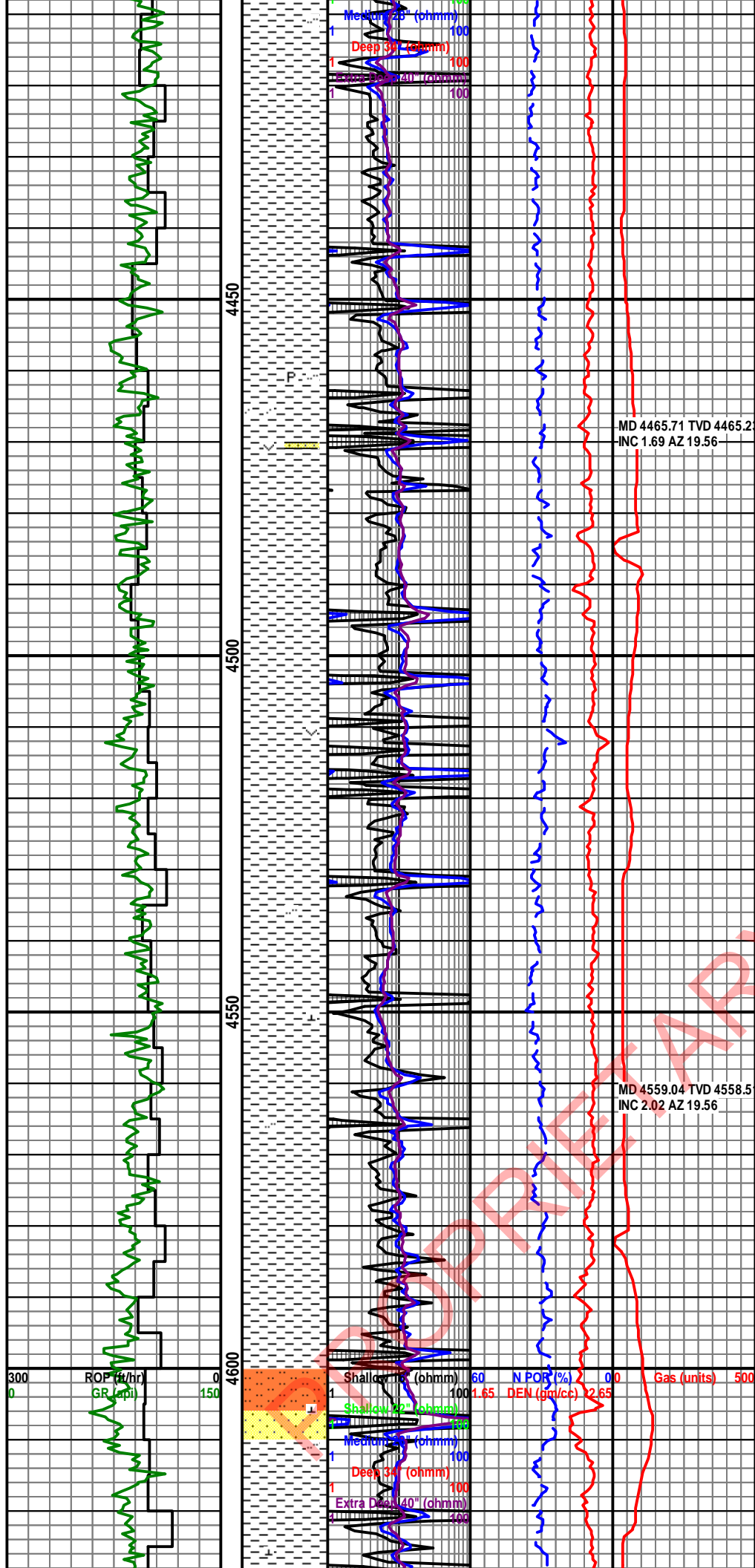
4320'-4350' CLYST 100% med gy, blk-amor, sft-easily fri, fr amt PDC cuttings habit

4350'-4380' CLYST 100% med dk gy wi tr mod hd dk gy clyst, blk, sft-fri, com PDC cuttings

MD 4373.26 TVD 4372.8
INC 2.11 AZ 22.24

4380'-4410' CLYST 100% med dk gy, blk, sft-fri, com PDC cuttings, slty

Shallow 16" (ohmm) 60 N POR (%) 0.0 Gas (units) 500
1 100 1.65 DEN (gm/cc) 2.65
4 Shallow 12" (ohmm) 100
4 Shallow 8" (ohmm) 100



4410'-4440' CLYST 100% med dk gy, sft-fri, abnt PDC cuttings, blkly

4440'- 4470' CLYST 100% med dk gy, sft-fri, abnt PDC cuttings, blkly, slty, tr pyr, tr small ss frags, vf, weakly cmtd, tuf mtx likely gave off dull lt gn flor, no cut or other o indicators

MD 4465.71 TVD 4465.2
INC 1.69 AZ 19.56

4470'-4500' CLYST 100% med dk gy, sft-fri, abnt PDC cuttings, blkly, slty, tr small ss frags, vf, tuf mtx likely gave off dull lt gn flor, no cut or other o indicators

4500'- 4530' CLYST 100% med dk gy, sft-fri fri, com PDC cuttings, blkly, tr small ss frags, vf, calc cmt, no flor

4530'-4560' CLYST 100% med dk gy, sft-fri fri, com PDC cuttings, blkly, tr small ss frags, vf, calc cmt, no florflor

MD 4559.04 TVD 4558.5
INC 2.02 AZ 19.56

4560'-4590' CLYST 100% med dk gy, sft-fri fri, com PDC cuttings, blkly, tr sltst wi wk wk reac-HCL

4590'-4620' CLYST 95% med dk gy, sft-fri fri, com PDC cuttings, blkly, tr slty; Ss 5% vf, lt gy, sb-round, w srt, moderate calc cmt, fr visible por, sl tuf?, dull lt gn flor, no cut, no stn

4620'- 4650' CLYST 100% med gy, sft-fri, com

PDC cuttings, blk, tr vf calc ss wi no flor

MD 4651.17 TVD 4650.5
INC 2.19 AZ 23.91

4650'-4680' CLYST 100% med gy, sft-fri, com
PDC cuttings, blk, rr vf calc ss wi no flor

4680'-4710' CLYST 100% med gy, sft-fri, com
PDC cuttings, blk, rr vf calc ss wi no flor

4710'-4740' CLYST 80% med gy, sft-fri, occly
hd SH cuttings, com PDC cuttings, blk, non
calc; SLTST 20% lt gy-med gy, thn carb bdg,
calc cmt, grds-vf l sd

MD 4743.27 TVD 4742.5
INC 2.64 AZ 25.07

4740'-4770' CLYST 95% med lt gy-med gy,
sft-fri, occly frm, com PDC cuttings, blk, non
calc; SLTST 5% lt gy-med gy, carb mat scat,
calc cmt

4770'-4800' CLYST 95% med lt gy-med gy,
sft-fri, frm, com PDC cuttings, blk, non calc;
SLTST 5% lt gy, calc cmt cmt

300 ROP (ft/hr)
0 GR (gpm)

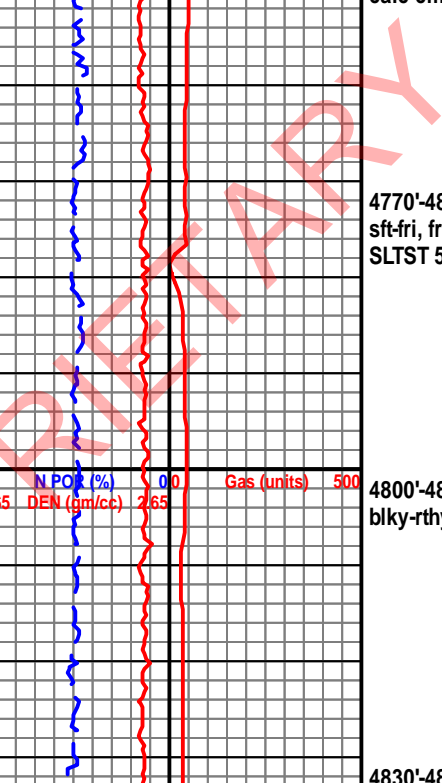
4800

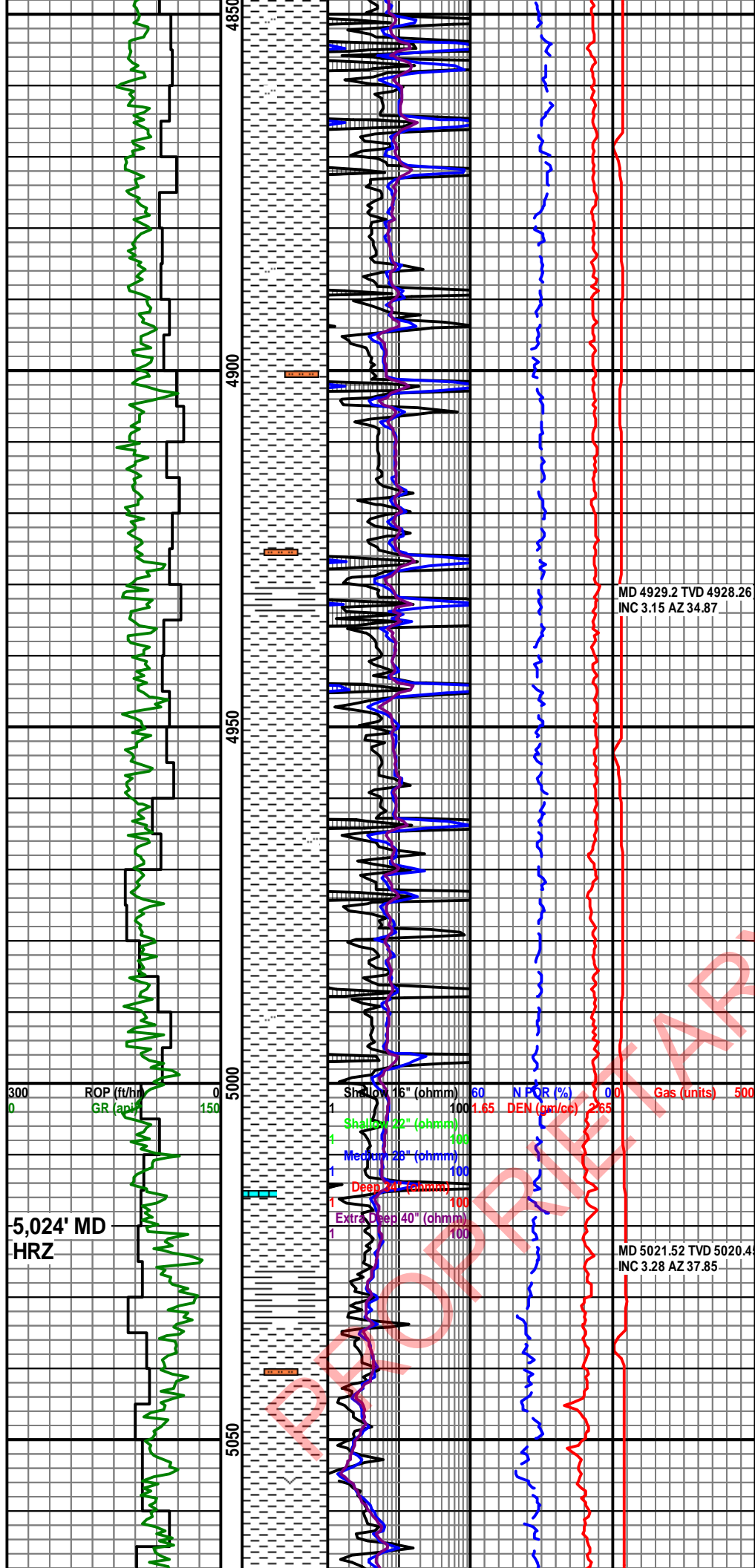
Shallow 46" (ohmm)	60	N POR (%)	0.0	Gas (units)	500
Shallow 42" (ohmm)	100	DEN (gm/cc)	2.65		
Shallow 40" (ohmm)	100				
Shallow 38" (ohmm)	100				
Deep 36" (ohmm)	100				
Extra Deep 40" (ohmm)	100				

4800'-4830' CLYST 100% med gy, sft-fri, frm,
blk-rthy, non calc, sl slty

MD 4836.87 TVD 4836.0
INC 3.09 AZ 32.03

4830'-4860' CLYST 100% med lt gy-med gy,
sft-fri, occ PDC cuttings, non calc, sl slty





4860'-4890' CLYST 100% med gy, sft, fragile, non calc, sl slty

4890'-4920' CLYST 100% med lt gy-med gy, sft-fri, non calc, incrg slt

4920'-4950' CLYST 90% med lt gy-med gy, sft-fri, non calc, slty ip; SH 10% dk gy, frm-hd, occlly brit, rthy-fis ip, non calc on calc

MD 4929.2 TVD 4928.26
INC 3.15 AZ 34.87

4950'-4980' CLYST 100% med lt gy, sft-fri, non calc, rarely slty

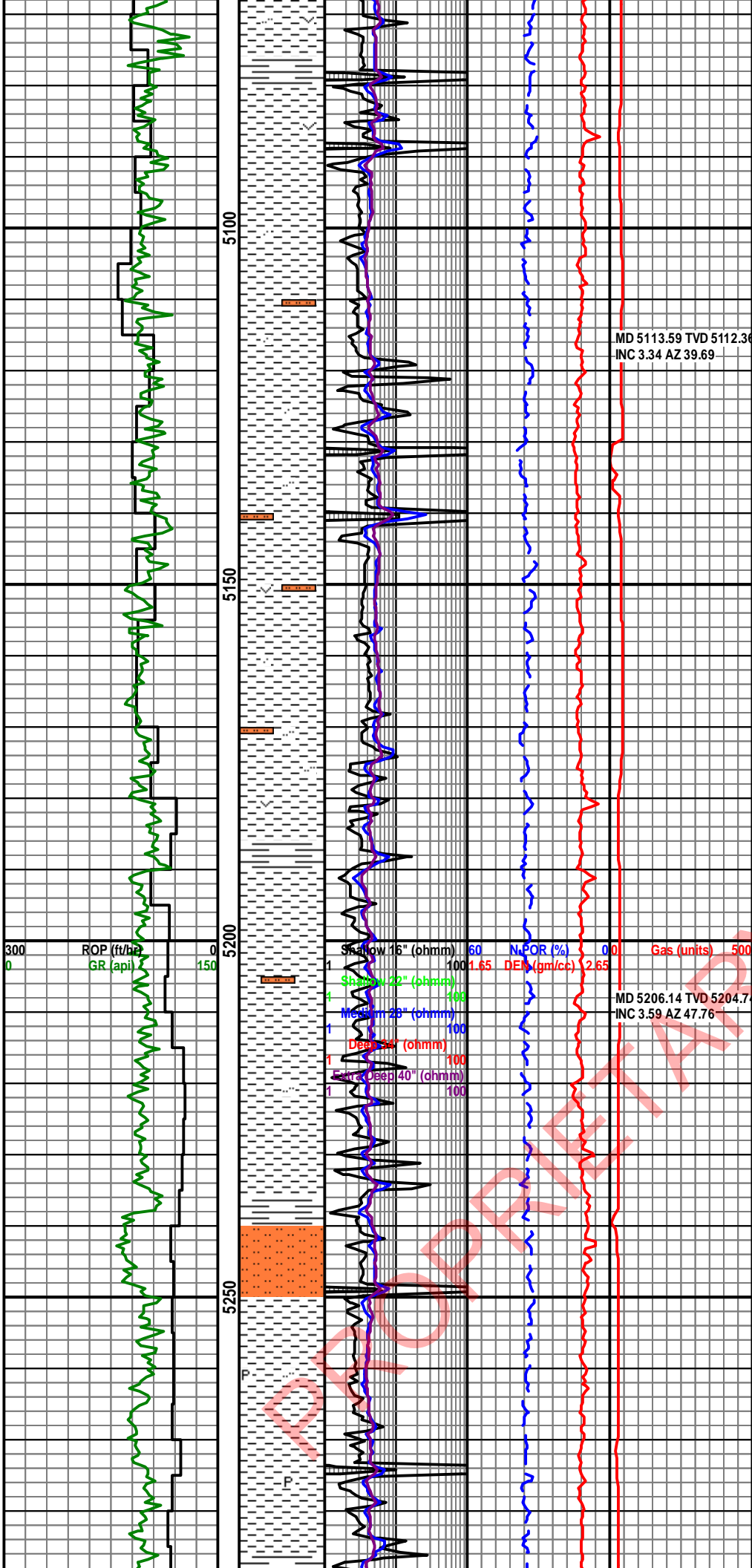
4980'-5010' CLYST 100% lt gy-med lt gy, sft, fragile, non calc

5010'-5040' CLYST 85% med dk gy, frm, fragile, crumbly, pyr, slightly calc, slty ip, rr sd grs, med, sb ang; SH 10% med dk gy, frm, ply fis; LS 5%

MD 5021.52 TVD 5020.4
INC 3.28 AZ 37.85

5040'-5070' CLYST 75% med lt gy-med dk gy, frm, fragile, crumbly, non calc, slty ip; SH 20% med dk gy, ply fis, non calc; TUFF 5%

5,024' MD
HRZ



5070'-5100' CLYST 85% med dk gy, frm, fragile, crumbly, non calc, slty ip; SH 10% med dk gy, ply fis, non calc; TUFF 5%

5100'- 5130' CLYST 90% med dk gy-dk gy, sft-frm, fragile, crumbly, tr tuff; SLTST 10% med gy, tr sd

MD 5113.59 TVD 5112.36
INC 3.34 AZ 39.69

5130'-5160' CLYST 90% med dk gy-dk gy, frm, fragile, crumbly, tr tuff; SLTST 10% med gy, tr sd

5160'-5190' CLYST 100% med dk gy-dk gy, sft-frm, mushy, brit in places, slty ip

5190'-5220' CLYST 80% med gy-med dk gy, sft-frm, mushy, rr pyr, slty ip, rr tan ls; SH 20% dk gy-blk, hd, brit, fis

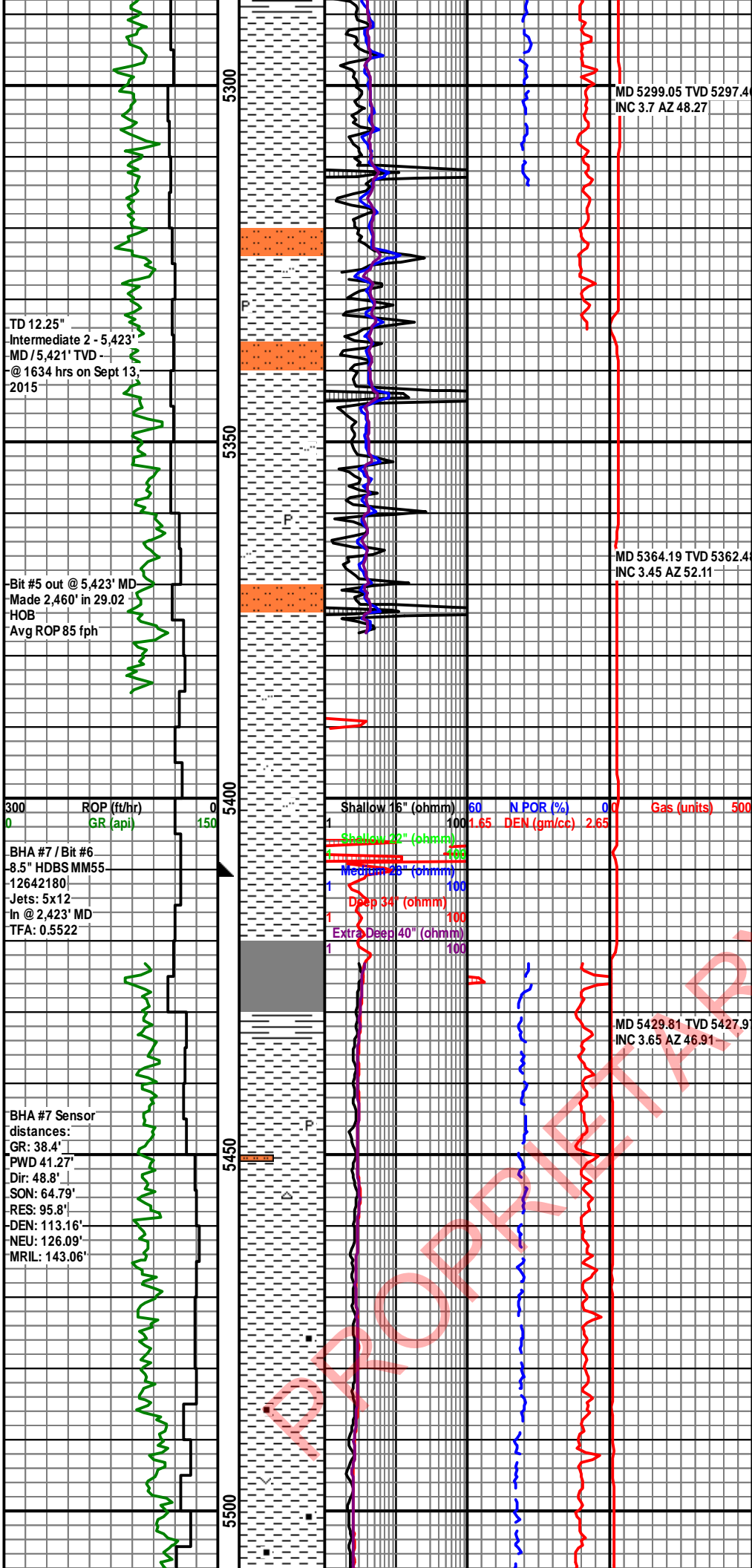
300 ROP (ft/hr) 0 GR (api) 150 5200

MD 5206.14 TVD 5204.7
INC 3.59 AZ 47.76

5220'-5250' CLYST 80% med gy-med dk gy wi brn hue, sft-frm, slty ip, rr sd, med l gr; SH 20% dk gy-blk, hd, brit, sb fis fis

5250'-5280' CLYST 90% med gy-med dk gy wi brn hue, sft-frm, fragile, rr pyr, slty ip, rr sd grs; SH 10% dk gy, hd, brit, sb fis

5280'-5310' CLYST 80% med gy wi brn hue, sft-frm, fragile, rr pyr, incrg slt, rr sd grs; SH 20% dk gy, hd, brit, sb fis



5310'-5340' CLYST 90% med gy wi brn hue, sft frm, fragile, blk, incrg slt, rr sd grs; SH 10% med gy, hd, brit, sb fis-fis

5340'-5370' CLYST 100% med gy wi brn hue, sft, fragile, mushy, slty ip, ls present

5370'-5400' CLYST 100% med lt gy wi brn hue, sft, fragile, slty, diss pyr, com ls, slty ip lty ip

5400'-5423' CLYST 100% med lt gy wi brn hue, sft, fragile, slty ip, pyr, tr ls, rr f l sd grnd grn

5430'-5460' CLYST 60% med lt gy-med gy, sft, fragile; SH 25% med dk gy, hd-brit, rthy, sl slty; SILSTONE 15% lt gy, occly grds-vf ss, rr pyr

5460'-5490' CLYST 85% med lt gy-med gy, sft, fragile, rr cht, slty ip, occ calc tuff; SH 15% med gy-med dk gy, hd, brit, rthy, pyr

5490'-5520' CLYST 95% med lt gy-med gy, sft, fragile, rr cht, slty ip, rr pyr, occ calc tuff; Sh 5% med gy, hd, brit, sl carb ip

5,539' MD
PEBBLE
SHALE

MD 5518.31 TVD 5516.2
INC 3.73 AZ 45.18

5520'-5550' SLTST 60% med gy wi brownish hue, occ pyr, incrg thn carb laminations, tr tuff ip, v lt gy sd, grds from slt-vf-med l grn sz, sb rd, p-moderate srtg; CLYST 30% med gy, sft, fragile; SH 10% med gy-med dk gy

5550

5580'-5610' SLTST 60% med gy wi brownish hue, com pyr, com crbnt, tr tuff, grdg-vf gy sd; SH 20% med dk gy, frm-mod hd; CLYST 20% med gy, sft-frm

5600

300 ROP (ft/hr)
0 GR (api)
150

Shallow 16" (ohmm)	60	N POR (%)	0.0	Gas (units)	500
Shallow 22" (ohmm)	100	DEN (gm/cc)	2.65		
Medium 28" (ohmm)	100				
Deep 34" (ohmm)	100				
Extra Deep 40" (ohmm)	100				

MD 5612.7 TVD 5610.48
INC 3.58 AZ 42.26

5640'-5670' CLYST 95% med gy-med dk gy wi com brownish hues, frm-hd, moderate-w ind, blk-elongated, occlly slty, tr pyr; SS 5% lt gy wi trnsl-trnsp, vf wi tr fltg med grs, sb round-sb ang, p srtg, calc cmt

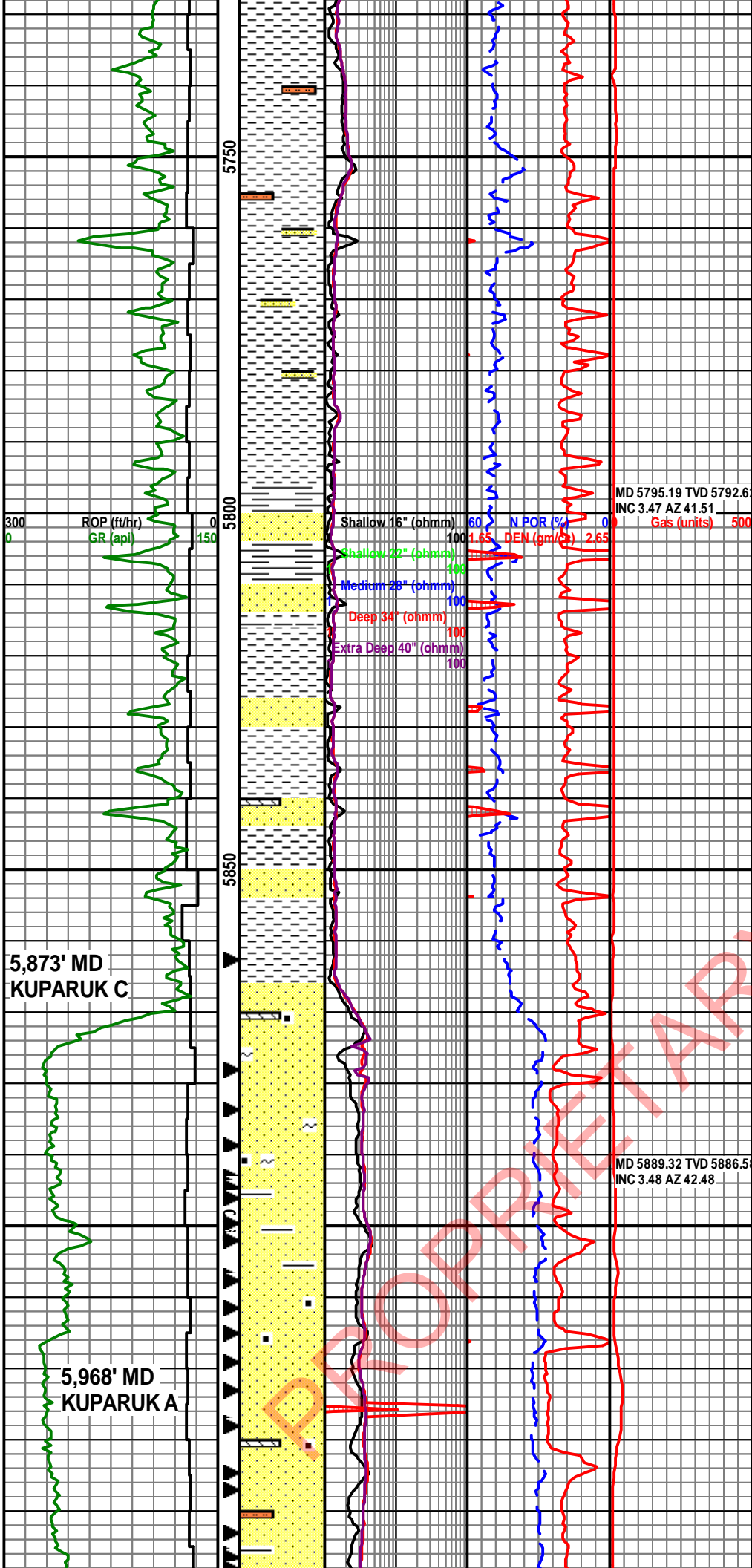
5650

5700

MD 5704.09 TVD 5701.7
INC 3.56 AZ 42.97

5700'-5730' SLTST 60% med gy wi brownish hue, frm-fri, occlly grdg-l vf, arg mtx, tr pyr; CLYST 40% med gy-med dk gy wi com brownish hues, frm-fri, mod ind, commonly slty, tr pyr, tr SH

PROPERTIES



5730'-5750' SLTST 50% med gy wi brownish hue, fri-frm, grdg-vf sd, arg mtx; CLYST 40% med dk gy wi brownish hues, frm-fri, occlly grdg-slty; SS 10% trnsl-trnsp-lt gy hues, uncons, disaggregated, vf-u med, ply srt, sb round-round

5790'-5820' SH 70% dk gy, fri-mod hd, flky-splt; CLYST 20% med gy, sft-fri, hydrated, rd-amor, occlly mushy; SLTST 10% lt gy, fri, tr lse sd

5820'-5850' SS 60% lt-med gy, lse uncons u vf-l f qtz, rd-sr, w srt; CLYST 40% med gy-dk gy, amor-blky, shaley, flky-splt

5850'- 5880' SS 80% gy-med gy wi abnt trnsl-trnsp qtz & com wh grs, vf-f wi scat med, w-moderate srt, sb round, abnt carb, tr glau, tr sid cmt; CLYST 20% med gy-dk gy, sft-frm

5880'-5950' SS 80% lt gy-med gy wi abnt trnsp-trnsl grs, vf-f qtz grs, occ c grs, w srt, sr-subangular, abnt carb mat, com lithics, tr sid cmt; SH 10% dk gy, mod hd, splf-flky; CLYST 10% med gy, mushy-frm, amor-nodr

5950'- 5970' SS 90% lt gy-med gy wi abnt trnsp-trnsl grs, vf-f qtz grs, occ m grs, w srt, sr-subangular, abnt carb mat, tr sid cmt, com lithics; SH 10% dk gy,

300 ROP (ft/hr)
0 GR (api)
150

5,873' MD
KUPARUK C

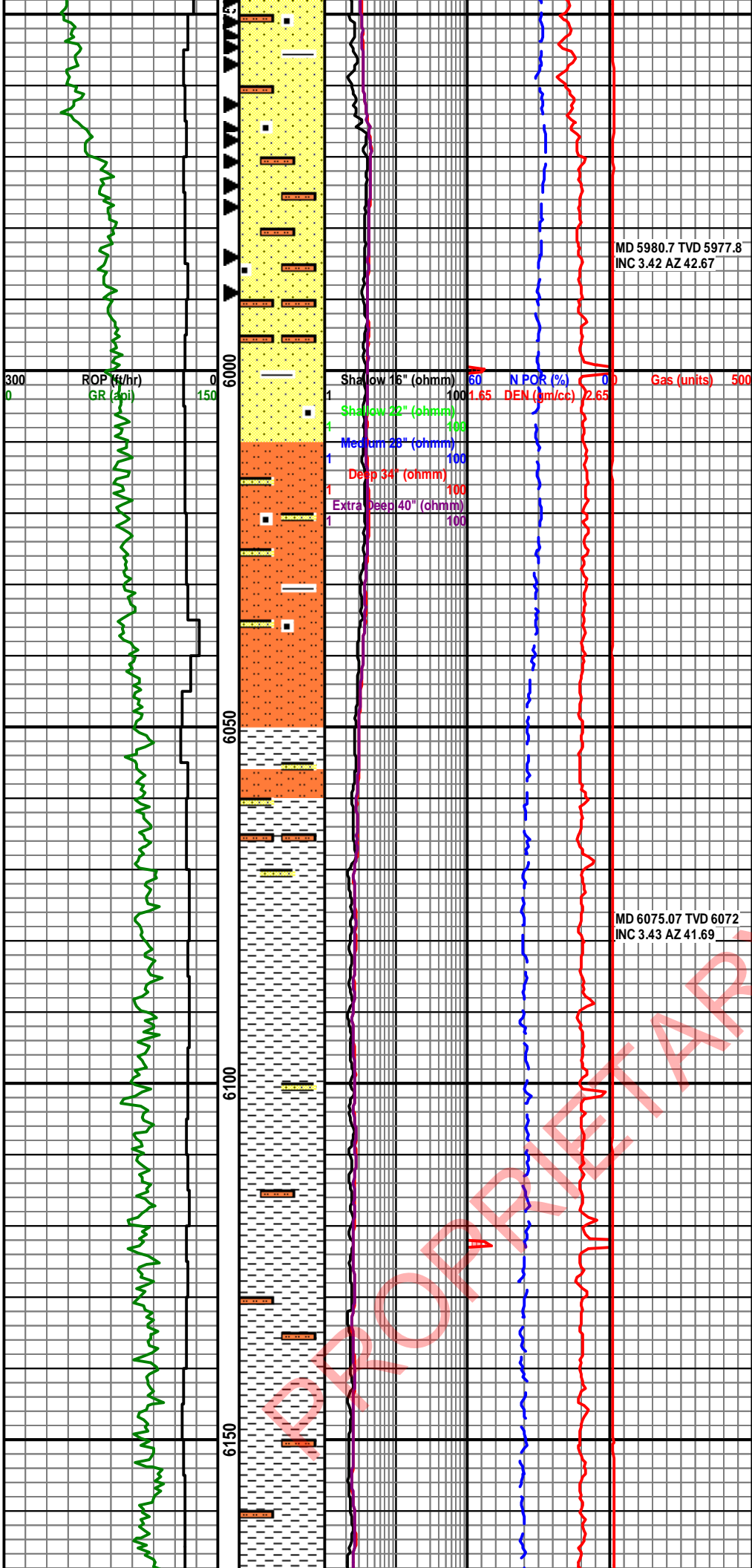
5,968' MD
KUPARUK A

Shallow 16" (ohmm) 60
Shallow 22" (ohmm) 100
Medium 28" (ohmm) 100
Deep 34" (ohmm) 100
Extra Deep 40" (ohmm) 100

N POR (%) 0
DEN (gm/cc) 2.65
Gas (units) 500

MD 5795.19 TVD 5792.6
INC 3.47 AZ 41.51

MD 5889.32 TVD 5886.5
INC 3.48 AZ 42.48



5950'-5970' SS 90% lt gy-med gy wi abnt trnsp-trnsl qtz grs, vf-f grs, occ m grs, w srt, sr-subangular, abnt carb mat, com lithics; SH 10% dk gy, mod hd, spltt-flky

MD 5980.7 TVD 5977.8
INC 3.42 AZ 42.67

5990'-6010' SS 50% lt gy-med lt gy wi abnt trnsp-trnsl qtz grs, f l-vf u, w srt, subangular-sr, carb mat; SLTST 50% med lt gy wi slight brownish hue, sft-fri, arg mtx, sl clayey, amor

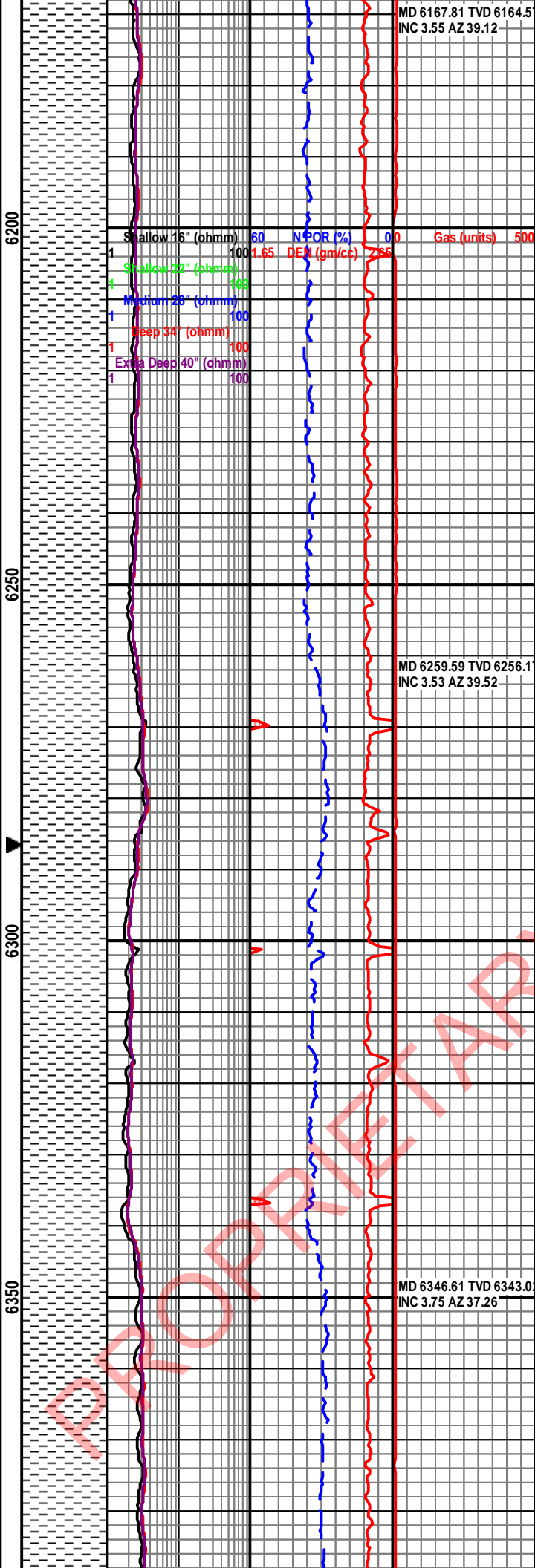
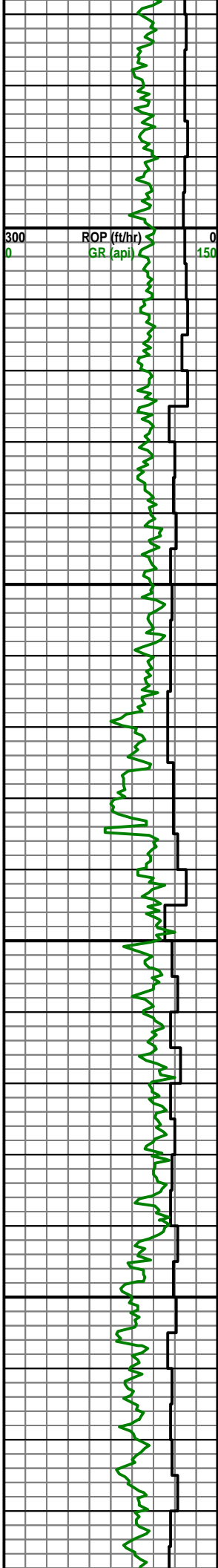
6010'- 6080' SLTST 55% med lt-med gy wi slight brownish hue, sft-fri, arg mtx, incrg cly content, amor; SS 45% lt gy-med lt gy wi abnt trnsp-trnsl qtz grs, f l-vf u, w srt, subangular-sr, carb mat scat

6080'- 6110' CLYST 80% med gy-med dk gy wi brownish hue, sft-occlly frm, rthy, occlly slty; SH 20% med dk gy-dk gy, hd, brit, elongated cuttings

MD 6075.07 TVD 6072
INC 3.43 AZ 41.69

6110'-6140' CLYST 90% med gy-med dk gy wi brownish hue, sft-occlly frm, rthy, increasingly slty; SH 10% med dk gy-dk gy, hd, brit, elongated cuttings

6140'- 6170' CLYST 80% med gy-med dk gy wi brownish hue, sft-frm, rthy, slty ip, carb, rr calc tuff; SH 20% med dk gy-dk gy, hd, brit, elongated cuttings



MD 6167.81 TVD 6164.5
INC 3.55 AZ 39.12

6170'-6200' CLYST 95% med gy-med dk gy wi brownish hue, sft-frm, occlly hd, rthy, slty ip, carb, rr calc tuff; SH 5% med dk gy-dk gy, hd, brit, elongated cuttings

6200'-6230' CLYST 95% med gy-med dk gy wi brownish hue, sft-frm, occlly hd, rthy, carb, rr calc tuff; SH 5% med dk gy-dk gy, hd, brit, elongated cuttings

6230'-6260' CLYST 90% med gy-med dk gy wi brownish hue, sft-frm, occlly hd, rthy, carb, rr calc tuff; SH 10% med dk gy-dk gy, hd, brit, elongated cuttings

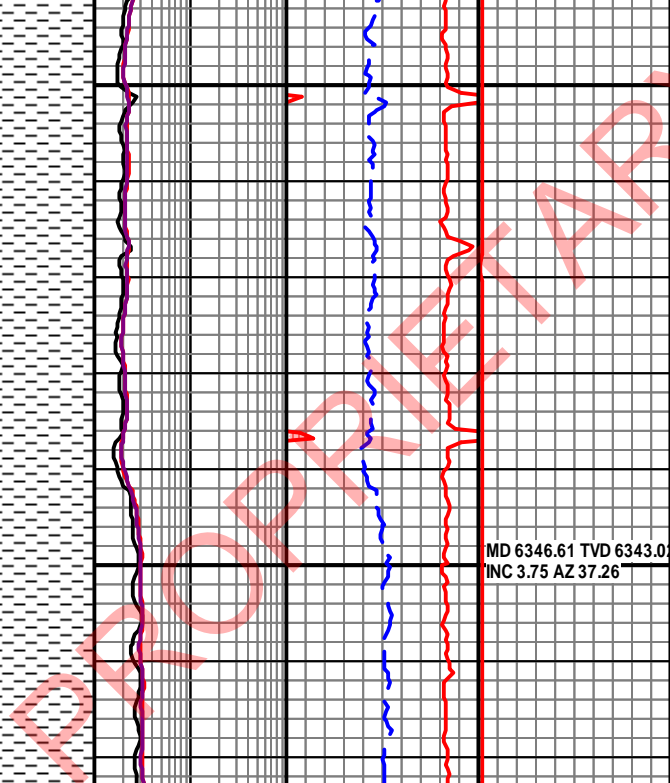
MD 6259.59 TVD 6256.1
INC 3.53 AZ 39.52

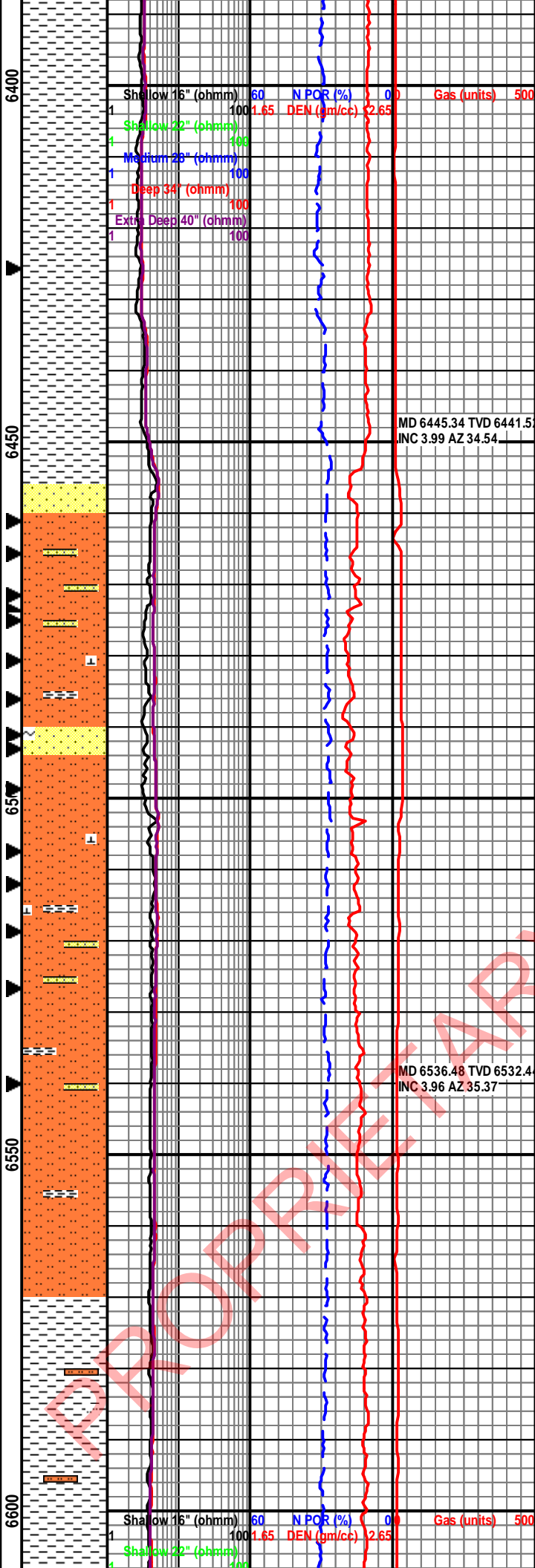
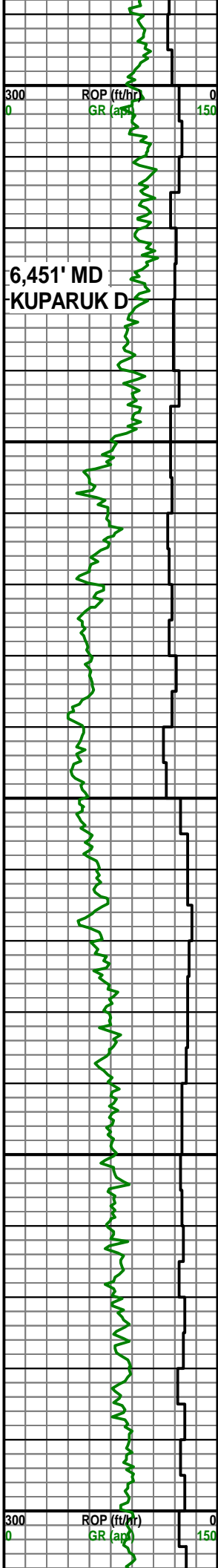
6260'-6290' CLYST 80% med gy-med dk gy wi brownish hue, sft-frm, occlly hd, rthy, slty ip, carb, rr calc tuff, sid; SH 20% med dk gy-dk gy, hd, brit, elongated cuttings

6290'-6320' CLYST 80% med gy-med dk gy wi brownish hue, sft-frm, occlly hd, rthy, slty ip, carb, rr calc tuff, sid; SH 20% med dk gy-dk gy, hd, brit, elongated cuttings

MD 6346.61 TVD 6343.0
INC 3.75 AZ 37.26

6350'- 6380' CLYST 80% med gy-med dk gy wi brownish hue, sft-frm, occlly hd, rthy, slty ip, carb, rr calc tuff, sid; SH 10% med dk gy-dk gy, hd, brit, elongated cuttings





6380'-6410' CLYST 90% med gy-med dk gy wi brownish hue, sft frm, occlly hd, rthy, incrg slt, carb, rr calc tuff, rr glauc cly; SH 10% med dk gy-dk gy, hd, brit, elongated cuttings

6460'-6470' SS 65% lt gy-med gy wi abnt trnsp-trnsl qtz grs, fl grs-slty, mod srt, sr-subangular, wk calc cmt ip, tuf cly mtx, abnt carb mat, com lithics, rr pyr, glau, N/S visible o, Fluorescence: mod abnt, sp, orng, Cut: slow, dull, yel; CLYST 25%; SH 10%

6490'- 6500' SS 50% lt gy-med gy wi abnt trnsp-trnsl qtz grs, vf-f, sr-subangular, uncons-cons wi wk calc cmt, dull yel flor over 40% spl, slow dull yel crush cut flor, dull yel resdl flor; SLTST 30% lt gy-med gy, sft-mod hd, fri; CLYST 20% lt gy-med gy, sft-mod hd, moderate induration, slty, sl calc

6560'- 6570' SS 50% lt gy-med gy wi abnt trnsp-trnsl, vf-f, subangular-rd, lse uncons qtz grs & lithics wi tr glau, tr f-med calc frags; SLTST 30% lt gy-med gy, easily fri-fri, arg-calc mtx, dull yel flor over 30% of spl, fnt slow bri yel crush flor, dull yel resdl flor; CLYST 20% med gy, sft-easily fri, amor-pty, slty

6600'-6630' CLYST 70% med dk gy-med gy wi brownish hues, mod hd-fri-sft, scat hydrated amor clays, grdg-slty in parts; SLTST 30% TST

6,451' MD
KUPARUK D

MD 6445.34 TVD 6441.5
INC 3.99 AZ 34.54

MD 6536.48 TVD 6532.4
INC 3.96 AZ 35.37

300 ROP (ft/hr)
0 GR (api)
150

Shallow 16" (ohmm) 60 N POR (%) 0
1 100 1.65 DEN (gm/cc) 2.65
Shallow 22" (ohmm) 108
4 100
Medium 28" (ohmm) 100
1 100
Deep 34" (ohmm) 100
1 100
Extra Deep 40" (ohmm) 100
1 100

300 ROP (ft/hr)
0 GR (api)
150

Shallow 16" (ohmm) 60 N POR (%) 0
1 100 1.65 DEN (gm/cc) 2.65
Shallow 22" (ohmm) 108
4 100

amor clays, grdg-slt in parts, SLTST 30% med gy wi brownish hues, fri-frn, arg mtx, com lse vf sd grs in spln spl

MD 6628.63 TVD 6624.3
INC 3.92 AZ 37.01

6660'-6690' CLYST 80% med dk gy wi brownish hues, frm fri-mod hd wi tr sft, blk-ymodr wi tr hydrated amor cly, tr grdg-slt; SLTST 20% med gy wi brownish hues, frm fri, com carb flecks, tr dk flky-splt SH

6690'-6720' CLYST 100% med dk gy wi brownish hues, frm fri-sft, blk-ymodr, abnt hydrated clays, com grdg-slt, tr flky-splt blk-dk gy SH

MD 6721.62 TVD 6717.1
INC 3.89 AZ 35.41

6720'-6750' CLYST 100% med dk gy wi brownish hues, frm fri-sft, blk-ymodr, tr hydrated clays, com grdg-slt, tr spl blk-dk gy SH

MD 6745.05 TVD 6740.5
INC 3.99 AZ 35.86

6750'-6780' CLYST 100% med dk gy wi brownish hues, frm fri-sft, blk-ymodr, tr hydrated clays, com grdg-slt, tr spl blk-dk gy SH

6780'-6800' CLYST 60% med dk gy wi brownish hues, frm fri-sft, blk-ymodr, com grdg-slt; SS 40% lt gy wi abnt trnspl, vf-l f, w srt, lse uncons qtz grs wi abnt carb flecks, com lithicss

-TD 8.5" 6,800' MD /
-6,795' TVD -
@ 2309 hrs on Sept 21,
2015

300 ROP (ft/hr) 0
0 GR (api) 150

6650

6700

6750

6800

Shallow 16" (ohmm)	60	N POR (%)	0.0	Gas (units)	500
1	100	1.65	DEN (gm/cc)	2.65	
Shallow 22" (ohmm)	100				
4	100				
Medium 28" (ohmm)	100				
1	100				
Deep 34" (ohmm)	100				
1	100				
Extra Deep 40" (ohmm)	100				
1	100				

PROPRIETARY