



# EMPIRICA

*The Surface Logging Company*

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

Well Name: 15033217030100\_ANITA\_3420\_2-12H\_SandRidge Energy, Inc.  
Location: SEC: # 12, T-34S / R-20W-----COMANCHE CO., KANSAS  
License Number: AFE # DC 12852 Region: UNNAMED  
Spud Date: 04/06/2013 Drilling Completed: 04/21/2013  
Surface Coordinates: SURFACE: 250' FNL & 700' FEL, of SEC: 12, T34S-R-20W, SPOT LOCATION: N2 N2  
NW NE, COMANCHE COUNTY KANSAS  
Bottom Hole Coordinates: PBHL: 330' FSL & 660' FEL of SEC: 12, T-34S-R-20W, COMANCHE COUNTY, KANSAS  
Ground Elevation (ft): 1,795' K.B. Elevation (ft): 1,815' (+20' Est)  
Logged Interval (ft): 993' To: 9,535' Total Depth (ft): 9,535' T.D.  
Formation: MISSISSIPPIAN (HORIZONTAL WELL)  
Type of Drilling Fluid: DRILLING ON WATER-BASE MUD FROM 993 ft.  
Printed by MUD.LOG from WellSight Systems 1-800-447-1534 www.WellSight.com

## OPERATOR

Company: SANDRIDGE ENERGY, INC.  
Address: 123 ROBERT S KERR AVE  
OKLAHOMA CITY, OK 73102-6406

## GEOLOGIST

Name: Maggie Roden, Client Geologist  
Company: SandRidge Energy, Inc. Oklahoma City, OK 73102  
Address: 123 Robert S. Kerr Ave. Oklahoma City, OK 73102  
Maggie Roden, Office Phone: (405) 429-6676  
Cell Phone:(405)316-0351 mroden@sandridgeenergy.com;

## WELL SITE GEOLOGIST

Wayne Nix Cell-----(870)-826-6197  
Betty Nix Cell-----(870)-826-6196  
wnix@empirica-logging.com;  
bnix@empirica-logging.com  
Empirica Logging, Inc.  
P.O. Box 6005  
Edmond, OK 73083-6005  
PHONE: (405) 340-5545  
FAX: (405) 348-8303

## COMPANY MAN

COMPANY MEN: Louey Solis & Quincey Loven  
TOOL PUSHER: Darrel Wilson

# DRILLING CONTRACTOR

Lariat Inc.  
 Operator License # 34192  
 LARIAT RIG # 41  
 API: # 15-033-21703-01-00  
 AFE: # DC  
 Drilled on Water Base Mud,  
 HORIZONTAL WELL

## Comments

2 Manned Logging Services,  
 Start Logging Date: 04/7/2013 @ 731'  
 (Called in per CoMan)  
 SET 9.625 SURFACE CASING TO 731'  
 ON THE 04/7/2013 K.O.P. = ft.  
 SET 7" INTERMEDIATE CASING @ ' 04/15/2013  
 T.D. Depth @ 9,535 ft. M.D. --- T.D. on the 04/21/2013  
 RAN E-LOGS ON THE 04/22/2013  
 (FINAL LOG PDF) sent out on the: 04/23/2013  
 Released Logging Date: 04/23/2013 Thank You!

## 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

### FOSSIL

	Algae
	Amph
	Belm
	Bioclst
	Brach
	Bryozoa
	Cephal
	Coral
	Crin
	Echin
	Fish
	Foram
	Fossil
	Gastro
	Oolite
	Ostra
	Pelec
	Pellet
	Pisolite

	Plant
	Strom

### MINERAL

	Anhy
	Arggrn
	Arg
	Bent
	Bit
	Brecfrag
	Calc
	Carb
	Chtdk
	Chtlt
	Dol
	Feldspar
	Ferrpel
	Ferr
	Glau
	Gyp

	Hvymn
	Kaol
	Marl
	Minxl
	Nodule
	Phos
	Pyr
	Salt
	Sandy
	Silt
	Sil
	Sulphur
	Tuff

### STRINGER

	Anhy
	Arg
	Bent
	Coal
	Dol

	Gyp
	Ls
	Mrst
	Sltstrg
	Ssstrg

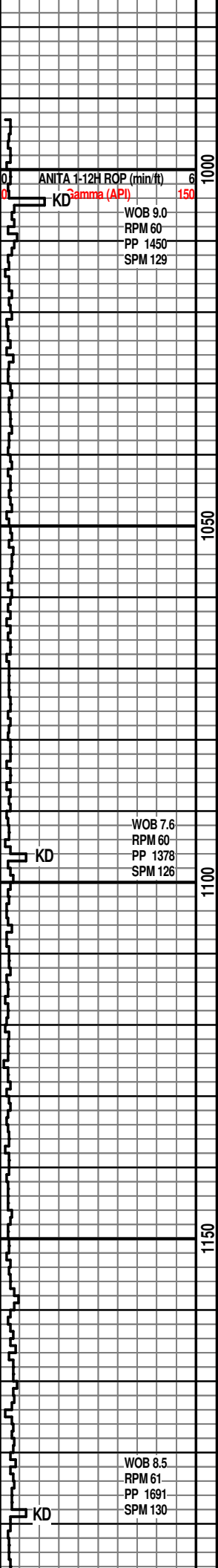
### TEXTURE

	Boundst
	Chalky
	Cryxln
	Earthy
	Finexln
	Grainst
	Lithogr
	Microxln
	Mudst
	Packst
	Wackest



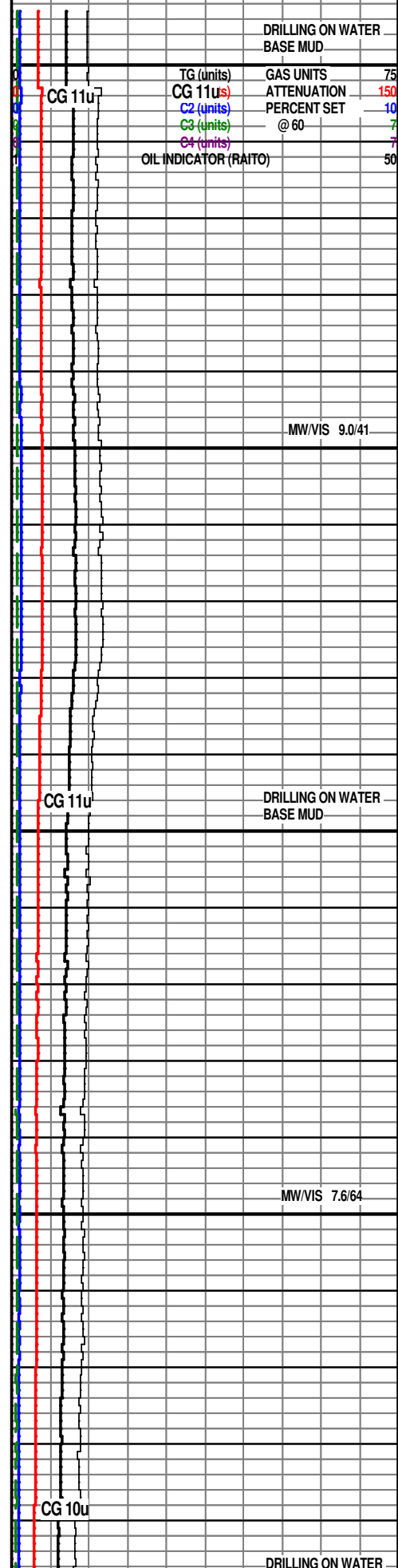
DEPTH OUT @'

(NO SAMPLES TILL 2,200')



WOB 7.6  
 RPM 60  
 PP 1378  
 SPM 126

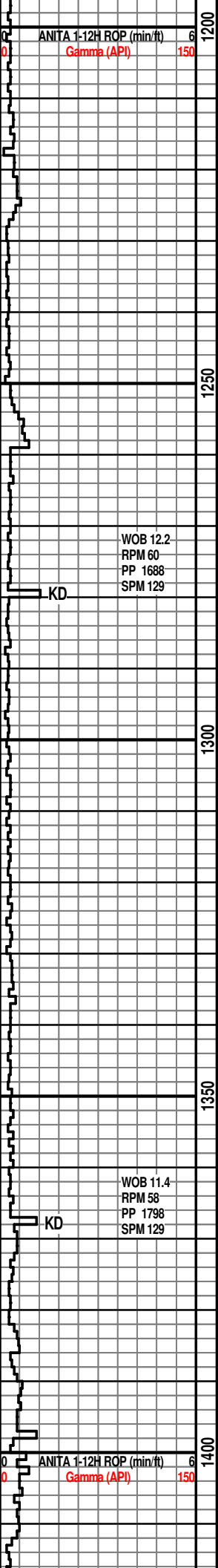
WOB 8.5  
 RPM 61  
 PP 1691  
 SPM 130



CG 11u

CG 11u

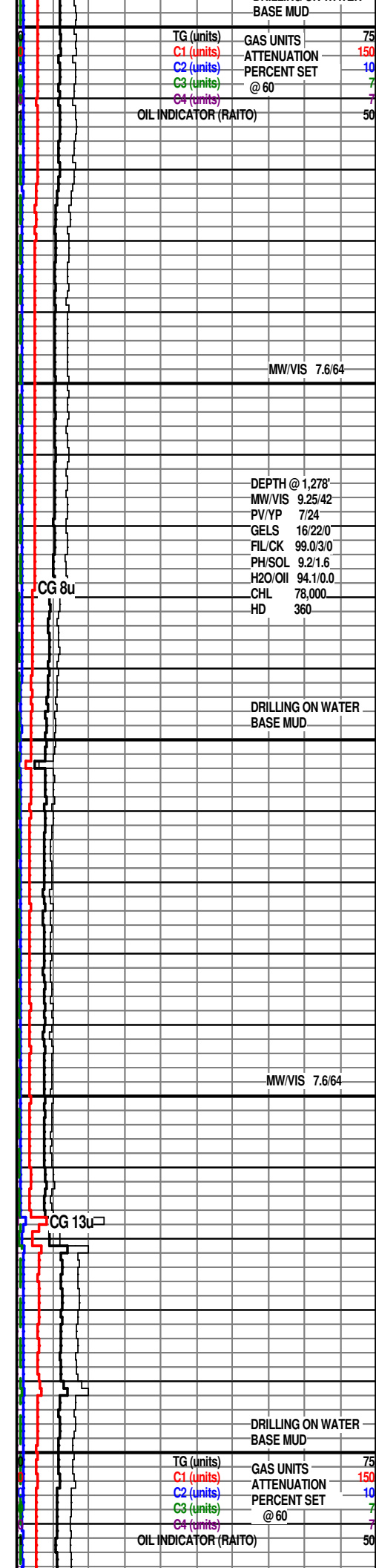
CG 10u

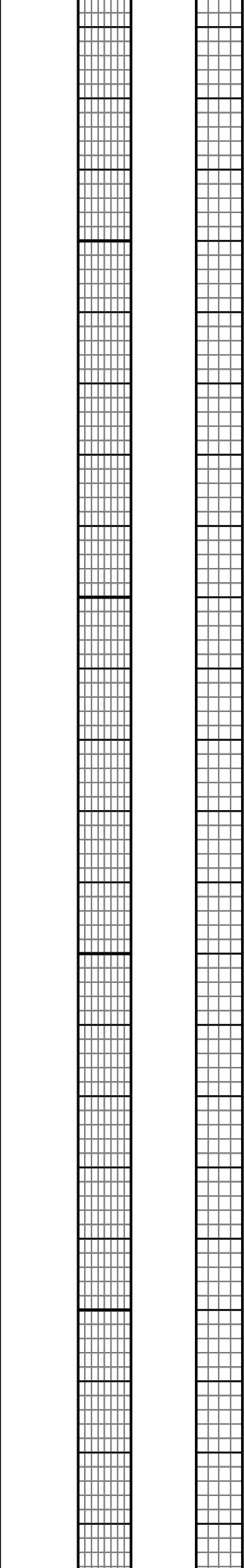
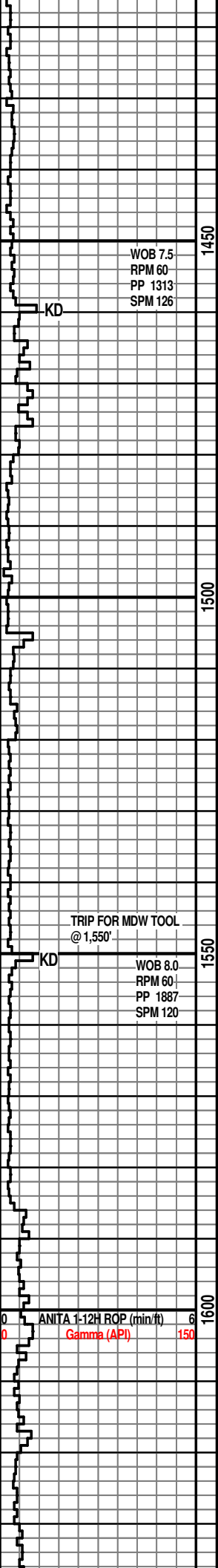


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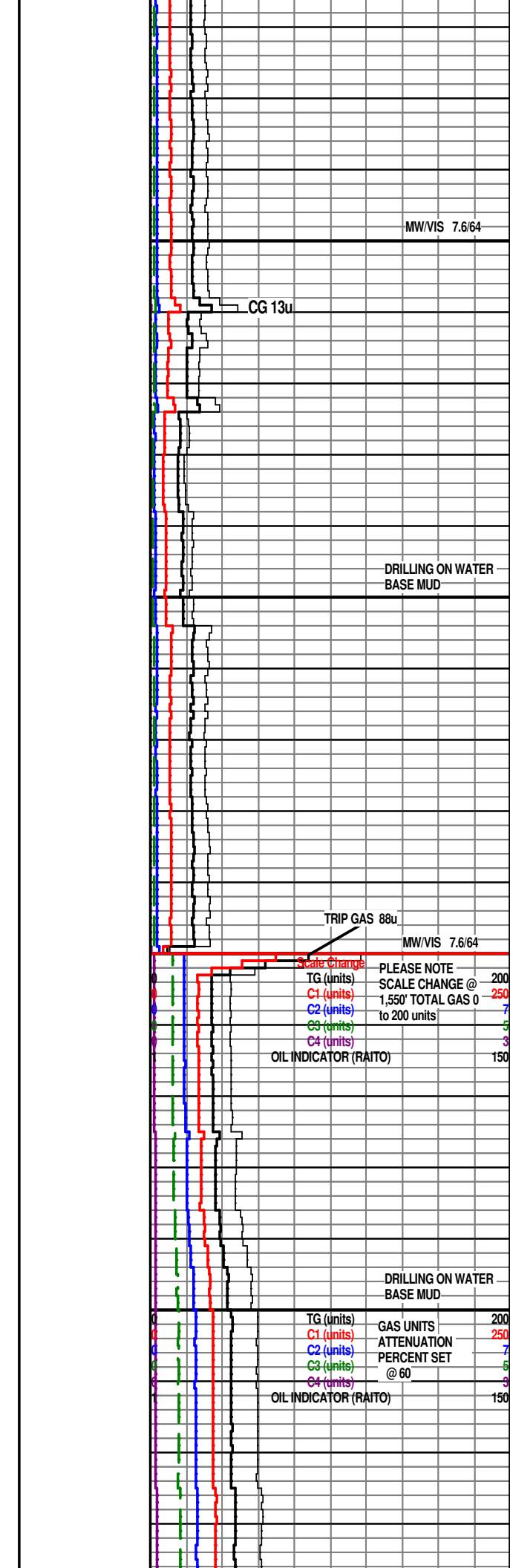
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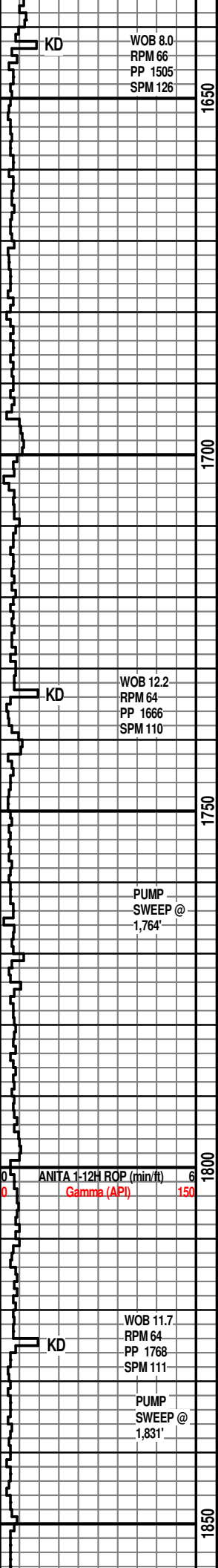
SURVEY: 1,404' MD 1,404' TVD  
INC. 1.00/ AZ. 260.0





(NO SAMPLES TILL 2,200')





1650

1700

1750

1800

1850

KD

WOB 8.0  
RPM 66  
PP 1505  
SPM 126

KD

WOB 12.2  
RPM 64  
PP 1666  
SPM 110

PUMP  
SWEEP @  
1,764'

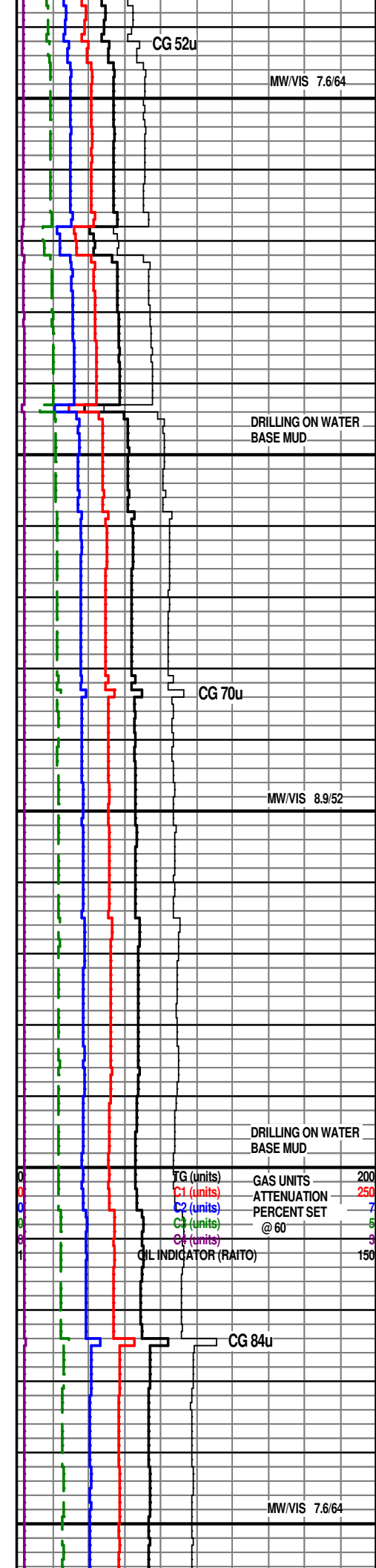
KD

ANITA 1-12H ROP (min/ft)  
Gamma (API) 150

WOB 11.7  
RPM 64  
PP 1768  
SPM 111

PUMP  
SWEEP @  
1,831'

(NO SAMPLES TILL 2,200')



CG 52u

MW/VIS 7.6/64

DRILLING ON WATER  
BASE MUD

CG 70u

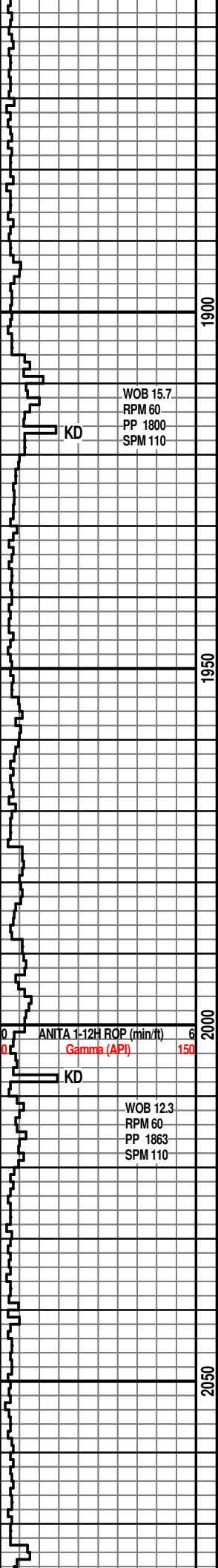
MW/VIS 8.9/52

DRILLING ON WATER  
BASE MUD

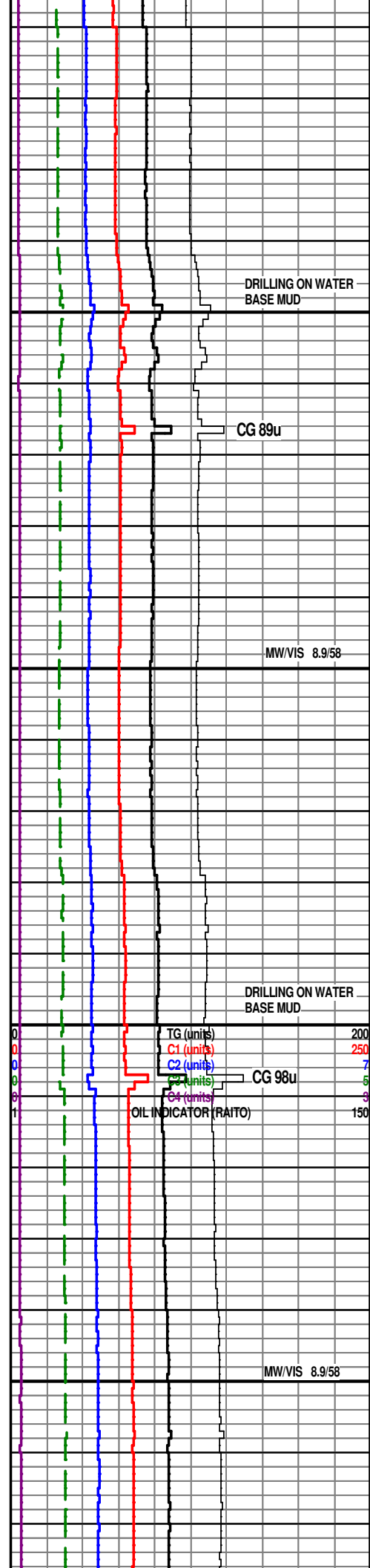
TG (units)	GAS UNITS	200
C1 (units)	ATTENUATION	250
C2 (units)	PERCENT SET	7
C3 (units)	@ 60	5
C4 (units)		3
OIL INDICATOR (RAITO)		150

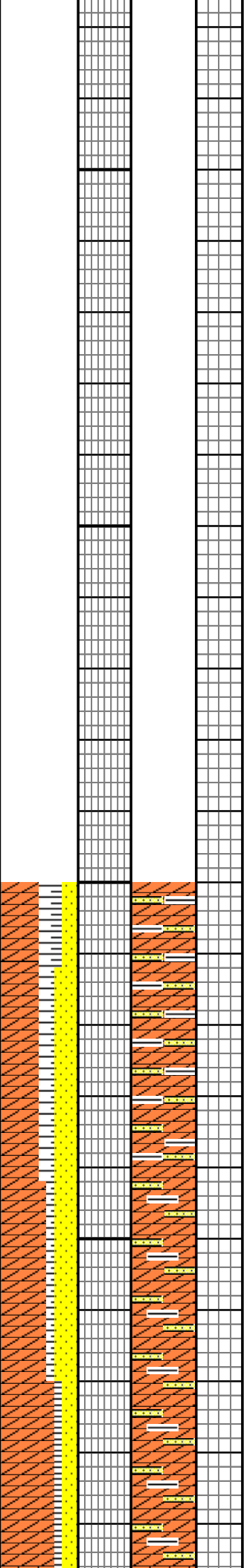
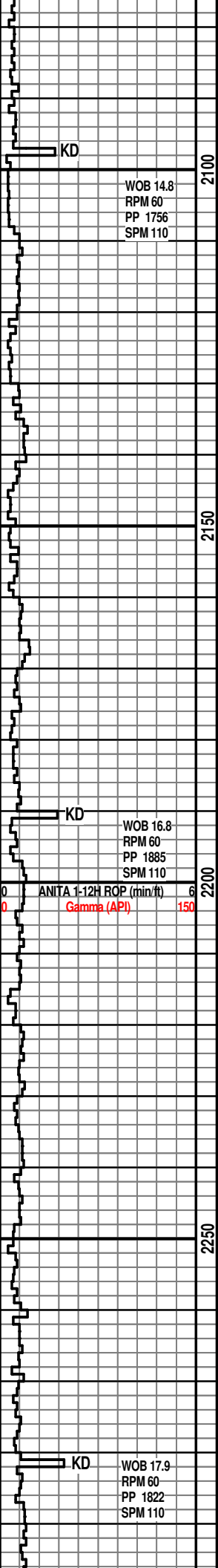
CG 84u

MW/VIS 7.6/64

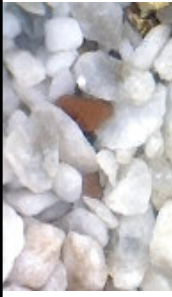


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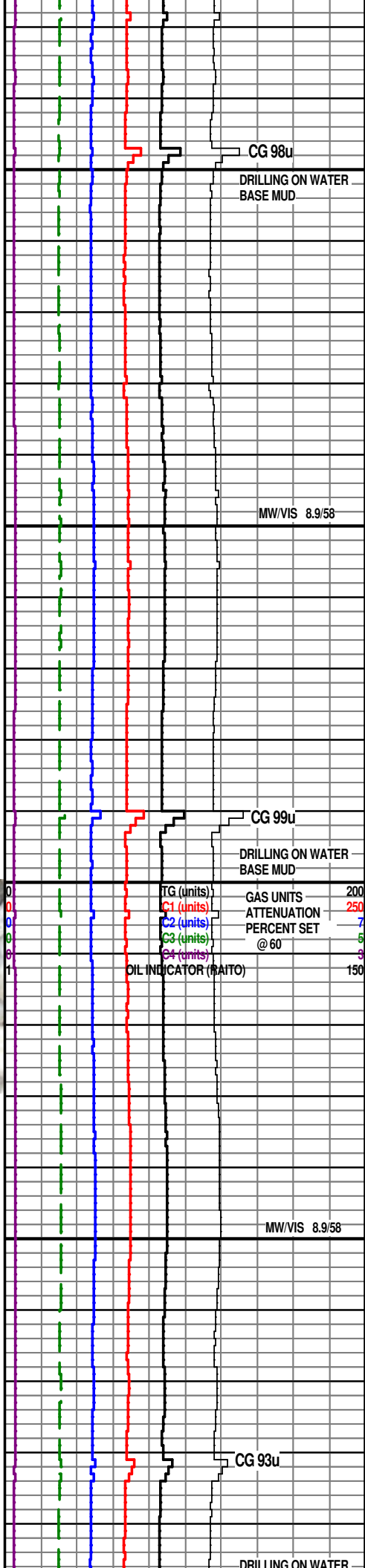


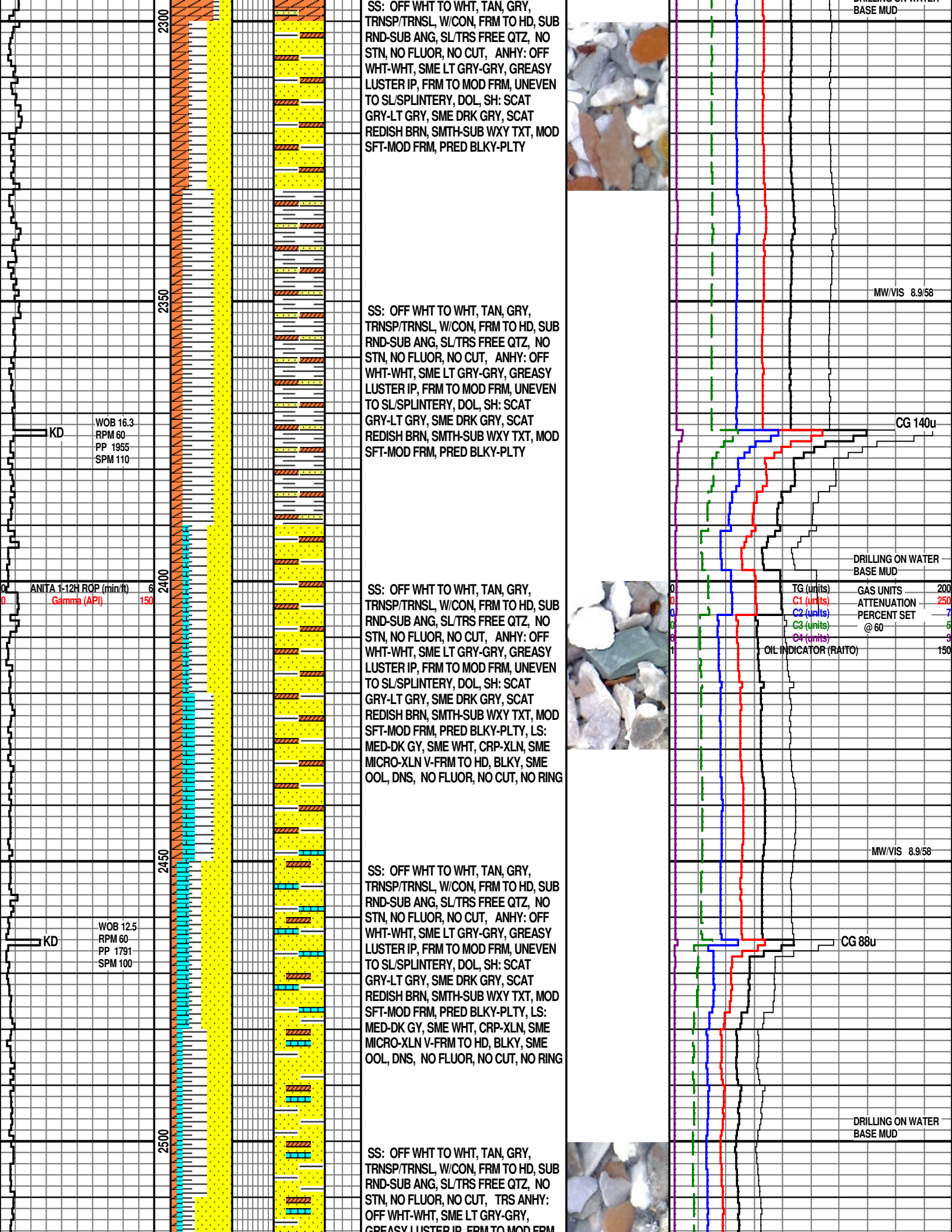


SS: OFF WHT TO WHT, TAN, GRY,  
 TRNSP/TRNSL, W SRT, FRM TO HD, SUB  
 RND-SUB ANG, SL/TRS FREE QTZ, SME  
 W/CON, NO STN, NO FLUOR, NO CUT,  
 ANHY: OFF WHT-WHT, SME LT GRY-GRY,  
 GREASY LUSTER IP, FRM TO MOD FRM,  
 UNEVEN TO SL/SPLINTERY, DOL, SH:  
 SCAT GRY-LT GRY, SME DRK GRY, SCAT  
 REDISH BRN, SMTH-SUB WXY TXT, MOD  
 SFT-MOD FRM, PRED BLKY-PLTY



SS: OFF WHT TO WHT, TAN, GRY,  
 TRNSP/TRNSL, W SRT, FRM TO HD, SUB  
 RND-SUB ANG, SL/TRS FREE QTZ, SME  
 W/CON, NO STN, NO FLUOR, NO CUT,  
 ANHY: OFF WHT-WHT, SME LT GRY-GRY,  
 GREASY LUSTER IP, FRM TO MOD FRM,  
 UNEVEN TO SL/SPLINTERY, DOL, SH:  
 SCAT GRY-LT GRY, SME DRK GRY, SCAT  
 REDISH BRN, SMTH-SUB WXY TXT, MOD  
 SFT-MOD FRM, PRED BLKY-PLTY





SS: OFF WHT TO WHT, TAN, GRY, TRNSP/TRNSL, W/CON, FRM TO HD, SUB RND-SUB ANG, SL/TRS FREE QTZ, NO STN, NO FLUOR, NO CUT, ANHY: OFF WHT-WHT, SME LT GRY-GRY, GREASY LUSTER IP, FRM TO MOD FRM, UNEVEN TO SL/SPLINTERY, DOL, SH: SCAT GRY-LT GRY, SME DRK GRY, SCAT REDISH BRN, SMTH-SUB WXY TXT, MOD SFT-MOD FRM, PRED BLKY-PLTY



SS: OFF WHT TO WHT, TAN, GRY, TRNSP/TRNSL, W/CON, FRM TO HD, SUB RND-SUB ANG, SL/TRS FREE QTZ, NO STN, NO FLUOR, NO CUT, ANHY: OFF WHT-WHT, SME LT GRY-GRY, GREASY LUSTER IP, FRM TO MOD FRM, UNEVEN TO SL/SPLINTERY, DOL, SH: SCAT GRY-LT GRY, SME DRK GRY, SCAT REDISH BRN, SMTH-SUB WXY TXT, MOD SFT-MOD FRM, PRED BLKY-PLTY

SS: OFF WHT TO WHT, TAN, GRY, TRNSP/TRNSL, W/CON, FRM TO HD, SUB RND-SUB ANG, SL/TRS FREE QTZ, NO STN, NO FLUOR, NO CUT, ANHY: OFF WHT-WHT, SME LT GRY-GRY, GREASY LUSTER IP, FRM TO MOD FRM, UNEVEN TO SL/SPLINTERY, DOL, SH: SCAT GRY-LT GRY, SME DRK GRY, SCAT REDISH BRN, SMTH-SUB WXY TXT, MOD SFT-MOD FRM, PRED BLKY-PLTY, LS: MED-DK GY, SME WHT, CRP-XLN, SME MICRO-XLN V-FRM TO HD, BLKY, SME OOL, DNS, NO FLUOR, NO CUT, NO RING



SS: OFF WHT TO WHT, TAN, GRY, TRNSP/TRNSL, W/CON, FRM TO HD, SUB RND-SUB ANG, SL/TRS FREE QTZ, NO STN, NO FLUOR, NO CUT, ANHY: OFF WHT-WHT, SME LT GRY-GRY, GREASY LUSTER IP, FRM TO MOD FRM, UNEVEN TO SL/SPLINTERY, DOL, SH: SCAT GRY-LT GRY, SME DRK GRY, SCAT REDISH BRN, SMTH-SUB WXY TXT, MOD SFT-MOD FRM, PRED BLKY-PLTY, LS: MED-DK GY, SME WHT, CRP-XLN, SME MICRO-XLN V-FRM TO HD, BLKY, SME OOL, DNS, NO FLUOR, NO CUT, NO RING

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WOB 16.3  
RPM 60  
PP 1955  
SPM 110

ANITA 1-12H ROP (min/ft)  
Gamma (API)

WOB 12.5  
RPM 60  
PP 1791  
SPM 100

DRILLING ON WATER BASE MUD

TG (units)	GAS UNITS	200
C1 (units)	ATTENUATION	250
C2 (units)	PERCENT SET	7
C3 (units)	@ 60	5
C4 (units)		3
OIL INDICATOR (RAITO)		150

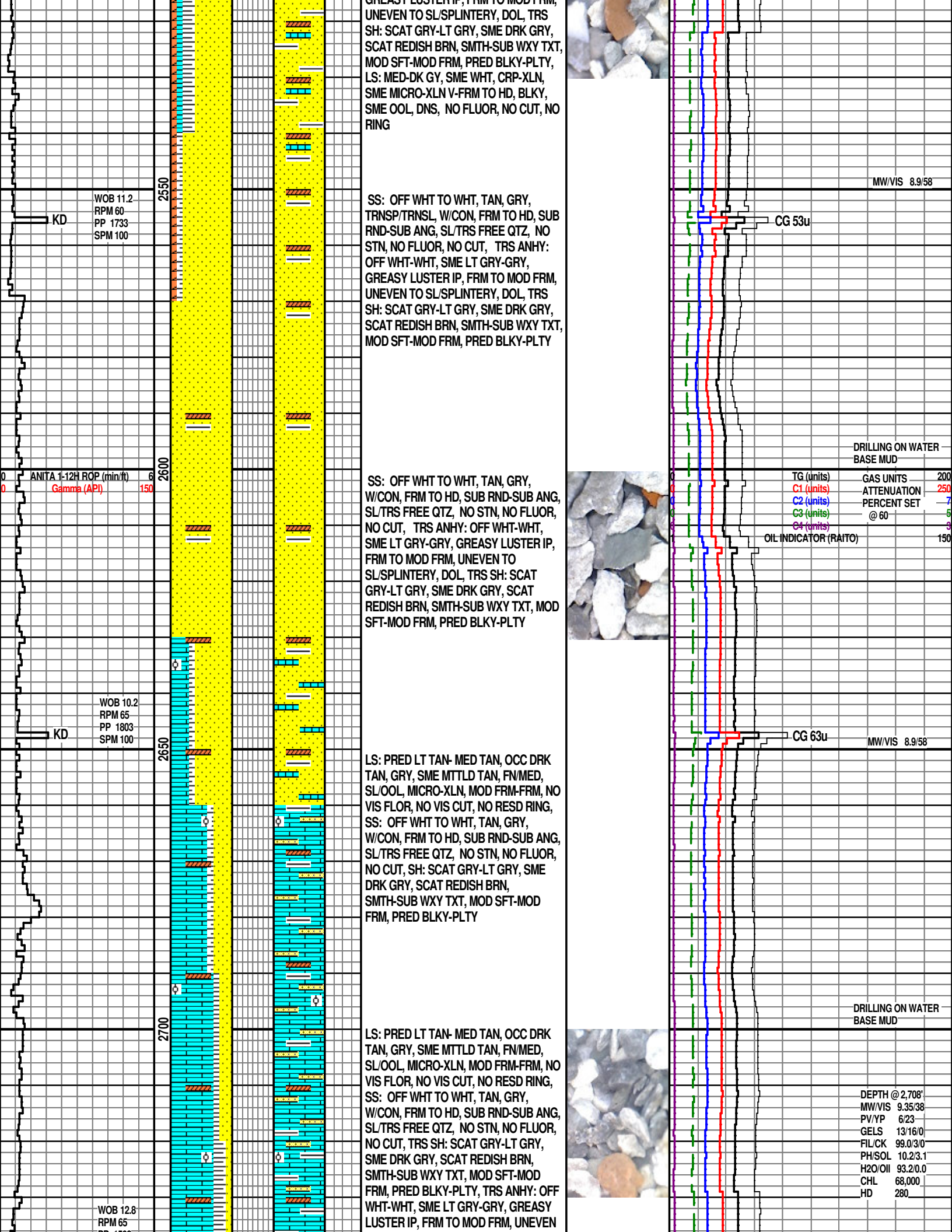
MW/VIS 8.9/58

CG 140u

MW/VIS 8.9/58

CG 88u

DRILLING ON WATER BASE MUD



2550  
2600  
2650  
2700

KD  
WOB 11.2  
RPM 60  
PP 1733  
SPM 100

ANITA 1-12H ROP (min/ft)  
Gamma (API)

KD  
WOB 10.2  
RPM 65  
PP 1803  
SPM 100

WOB 12.8  
RPM 65

SS: OFF WHT TO WHT, TAN, GRY, TRNSP/TRNSL, W/CON, FRM TO HD, SUB RND-SUB ANG, SL/TRS FREE QTZ, NO STN, NO FLUOR, NO CUT, TRS ANHY: OFF WHT-WHT, SME LT GRY-GRY, GREASY LUSTER IP, FRM TO MOD FRM, UNEVEN TO SL/SPLINTERY, DOL, TRS SH: SCAT GRY-LT GRY, SME DRK GRY, SCAT REDISH BRN, SMTH-SUB WXY TXT, MOD SFT-MOD FRM, PRED BLKY-PLTY

SS: OFF WHT TO WHT, TAN, GRY, W/CON, FRM TO HD, SUB RND-SUB ANG, SL/TRS FREE QTZ, NO STN, NO FLUOR, NO CUT, TRS ANHY: OFF WHT-WHT, SME LT GRY-GRY, GREASY LUSTER IP, FRM TO MOD FRM, UNEVEN TO SL/SPLINTERY, DOL, TRS SH: SCAT GRY-LT GRY, SME DRK GRY, SCAT REDISH BRN, SMTH-SUB WXY TXT, MOD SFT-MOD FRM, PRED BLKY-PLTY

LS: PRED LT TAN- MED TAN, OCC DRK TAN, GRY, SME MITLD TAN, FN/MED, SL/OOL, MICRO-XLN, MOD FRM-FRM, NO VIS FLOR, NO VIS CUT, NO RESD RING, SS: OFF WHT TO WHT, TAN, GRY, W/CON, FRM TO HD, SUB RND-SUB ANG, SL/TRS FREE QTZ, NO STN, NO FLUOR, NO CUT, SH: SCAT GRY-LT GRY, SME DRK GRY, SCAT REDISH BRN, SMTH-SUB WXY TXT, MOD SFT-MOD FRM, PRED BLKY-PLTY

LS: PRED LT TAN- MED TAN, OCC DRK TAN, GRY, SME MITLD TAN, FN/MED, SL/OOL, MICRO-XLN, MOD FRM-FRM, NO VIS FLOR, NO VIS CUT, NO RESD RING, SS: OFF WHT TO WHT, TAN, GRY, W/CON, FRM TO HD, SUB RND-SUB ANG, SL/TRS FREE QTZ, NO STN, NO FLUOR, NO CUT, TRS SH: SCAT GRY-LT GRY, SME DRK GRY, SCAT REDISH BRN, SMTH-SUB WXY TXT, MOD SFT-MOD FRM, PRED BLKY-PLTY, TRS ANHY: OFF WHT-WHT, SME LT GRY-GRY, GREASY LUSTER IP, FRM TO MOD FRM, UNEVEN

MW/VIS 8.9/58

CG 53u

DRILLING ON WATER BASE MUD

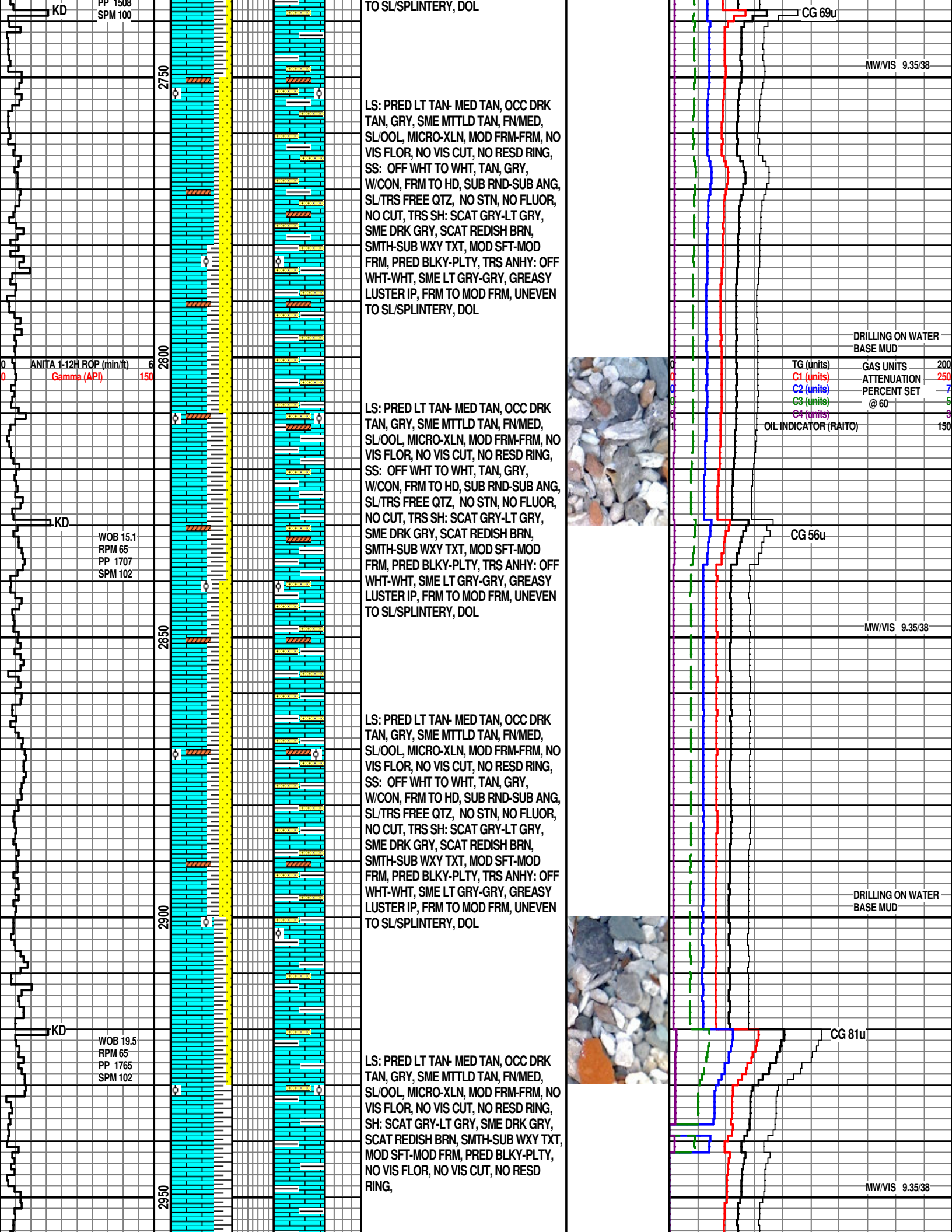
TG (units)	GAS UNITS	200
C1 (units)	ATTENUATION	250
C2 (units)	PERCENT SET	7
C3 (units)	@ 60	5
C4 (units)		3
OIL INDICATOR (RAITO)		150

CG 63u

MW/VIS 8.9/58

DRILLING ON WATER BASE MUD

DEPTH @ 2,708'	
MW/VIS	9.35/38
PV/VP	6/23
GELS	13/16/0
FIL/CK	99.0/3/0
PH/SOL	10.2/3.1
H2O/OIL	93.2/0.0
CHL	68,000
HD	280



PP 1508  
SPM 100

2750

LS: PRED LT TAN- MED TAN, OCC DRK TAN, GRY, SME MTTLD TAN, FN/MED, SL/OOL, MICRO-XLN, MOD FRM-FRM, NO VIS FLOR, NO VIS CUT, NO RESD RING, SS: OFF WHT TO WHT, TAN, GRY, W/CON, FRM TO HD, SUB RND-SUB ANG, SL/TRS FREE QTZ, NO STN, NO FLUOR, NO CUT, TRS SH: SCAT GRY-LT GRY, SME DRK GRY, SCAT REDISH BRN, SMTH-SUB WXY TXT, MOD SFT-MOD FRM, PRED BLKY-PLTY, TRS ANHY: OFF WHT-WHT, SME LT GRY-GRY, GREASY LUSTER IP, FRM TO MOD FRM, UNEVEN TO SL/SPLINTERY, DOL

2800

LS: PRED LT TAN- MED TAN, OCC DRK TAN, GRY, SME MTTLD TAN, FN/MED, SL/OOL, MICRO-XLN, MOD FRM-FRM, NO VIS FLOR, NO VIS CUT, NO RESD RING, SS: OFF WHT TO WHT, TAN, GRY, W/CON, FRM TO HD, SUB RND-SUB ANG, SL/TRS FREE QTZ, NO STN, NO FLUOR, NO CUT, TRS SH: SCAT GRY-LT GRY, SME DRK GRY, SCAT REDISH BRN, SMTH-SUB WXY TXT, MOD SFT-MOD FRM, PRED BLKY-PLTY, TRS ANHY: OFF WHT-WHT, SME LT GRY-GRY, GREASY LUSTER IP, FRM TO MOD FRM, UNEVEN TO SL/SPLINTERY, DOL

2850

LS: PRED LT TAN- MED TAN, OCC DRK TAN, GRY, SME MTTLD TAN, FN/MED, SL/OOL, MICRO-XLN, MOD FRM-FRM, NO VIS FLOR, NO VIS CUT, NO RESD RING, SS: OFF WHT TO WHT, TAN, GRY, W/CON, FRM TO HD, SUB RND-SUB ANG, SL/TRS FREE QTZ, NO STN, NO FLUOR, NO CUT, TRS SH: SCAT GRY-LT GRY, SME DRK GRY, SCAT REDISH BRN, SMTH-SUB WXY TXT, MOD SFT-MOD FRM, PRED BLKY-PLTY, TRS ANHY: OFF WHT-WHT, SME LT GRY-GRY, GREASY LUSTER IP, FRM TO MOD FRM, UNEVEN TO SL/SPLINTERY, DOL

2900

LS: PRED LT TAN- MED TAN, OCC DRK TAN, GRY, SME MTTLD TAN, FN/MED, SL/OOL, MICRO-XLN, MOD FRM-FRM, NO VIS FLOR, NO VIS CUT, NO RESD RING, SH: SCAT GRY-LT GRY, SME DRK GRY, SCAT REDISH BRN, SMTH-SUB WXY TXT, MOD SFT-MOD FRM, PRED BLKY-PLTY, NO VIS FLOR, NO VIS CUT, NO RESD RING,

2950

ANITA 1-12H ROP (min/ft)  
Gamma (API)

WOB 15.1  
RPM 65  
PP 1707  
SPM 102

WOB 19.5  
RPM 65  
PP 1765  
SPM 102

MW/VIS 9.35/38

DRILLING ON WATER  
BASE MUD

TG (units)	GAS UNITS	200
C1 (units)	ATTENUATION	250
C2 (units)	PERCENT SET	7
C3 (units)	@ 60	5
C4 (units)		3
OIL INDICATOR (RAITO)		150

CG 56u

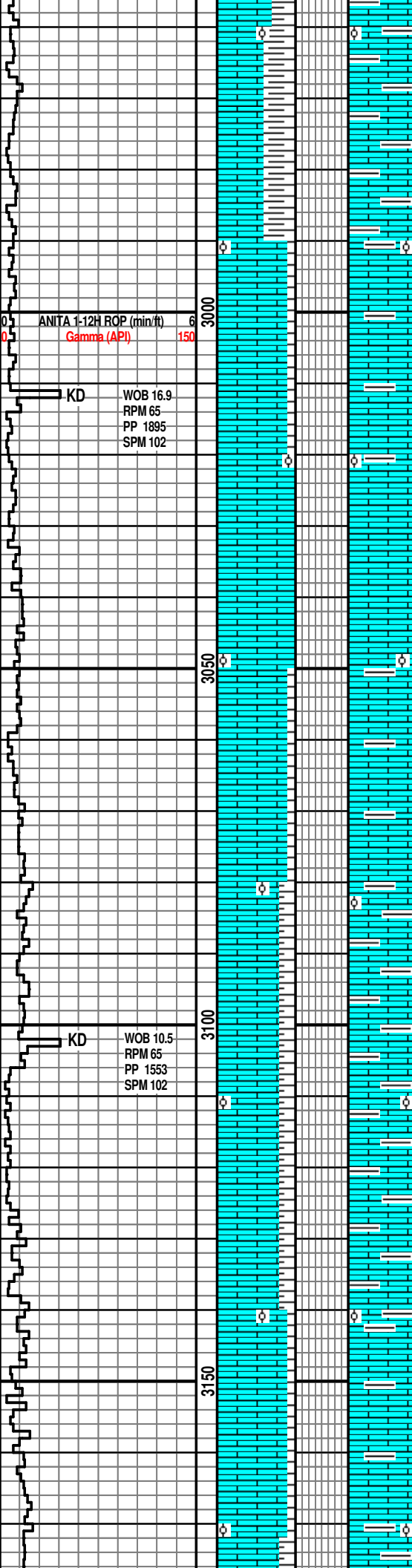
MW/VIS 9.35/38

DRILLING ON WATER  
BASE MUD

CG 81u

MW/VIS 9.35/38

CG 69u



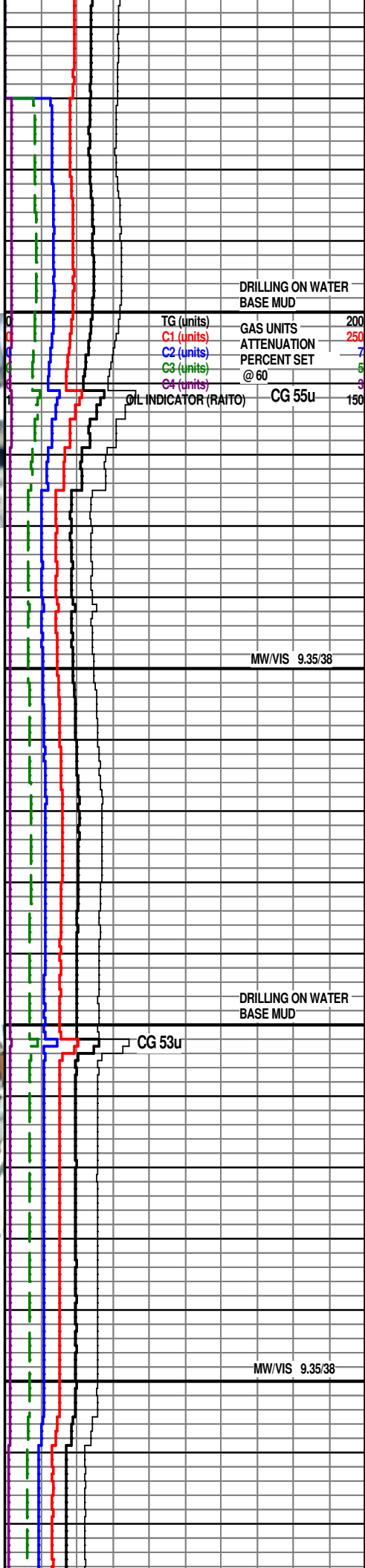
LS: PRED LT TAN- MED TAN, OCC DRK TAN, GRY, SME MTTLD TAN, FN/MED, SL/OOL, MICRO-XLN, MOD FRM-FRM, NO VIS FLOR, NO VIS CUT, NO RESD RING, SH: SCAT GRY-LT GRY, SME DRK GRY, SCAT REDISH BRN, SMTH-SUB WXY TXT, MOD SFT-MOD FRM, PRED BLKY-PLTY, NO VIS FLOR, NO VIS CUT, NO RESD RING,

LS: PRED LT TAN- MED TAN, OCC DRK TAN, GRY, SME MTTLD TAN, FN/MED, SL/OOL, MICRO-XLN, MOD FRM-FRM, NO VIS FLOR, NO VIS CUT, NO RESD RING, SH: SCAT GRY-LT GRY, SME DRK GRY, SCAT REDISH BRN, SMTH-SUB WXY TXT, MOD SFT-MOD FRM, PRED BLKY-PLTY, NO VIS FLOR, NO VIS CUT, NO RESD RING,

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DRILLING ON WATER BASE MUD

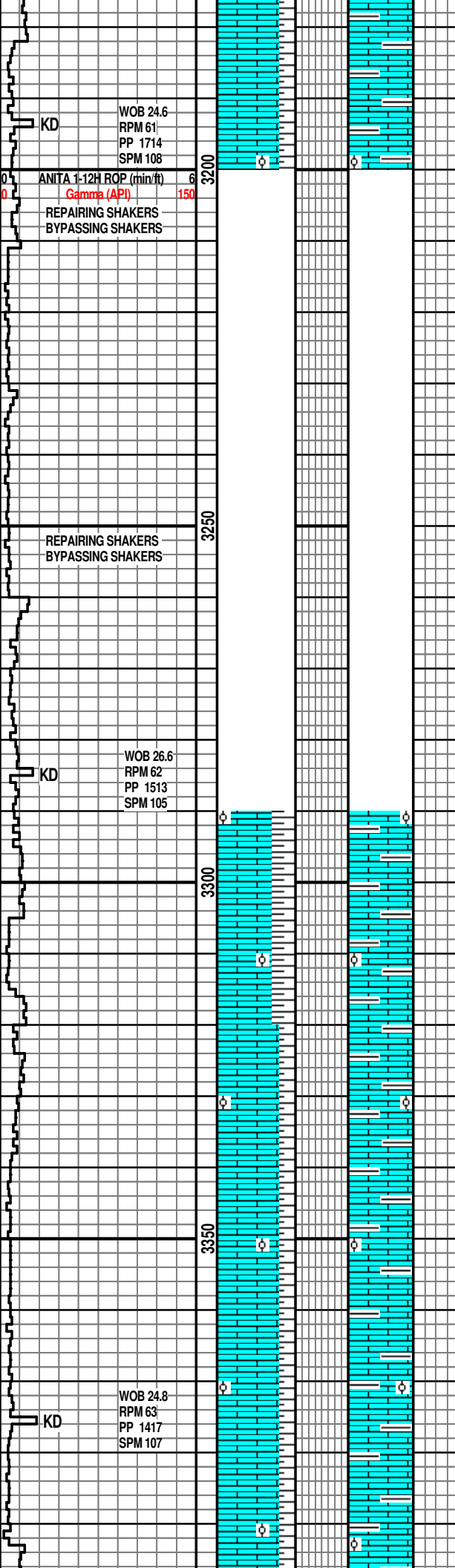
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C2 (units)	PERCENT SET	7
C3 (units)	@ 60	5
C4 (units)		3
OIL INDICATOR (RAITO)	CG 55u	150

MW/VIS 9.35/38

DRILLING ON WATER BASE MUD

CG 53u

MW/VIS 9.35/38



KD  
WOB 24.6  
RPM 61  
PP 1714  
SPM 108

ANITA 1-12H ROP (min/ft)  
Gamma (API) 150  
REPAIRING SHAKERS  
BYPASSING SHAKERS

REPAIRING SHAKERS  
BYPASSING SHAKERS

KD  
WOB 26.6  
RPM 62  
PP 1513  
SPM 105

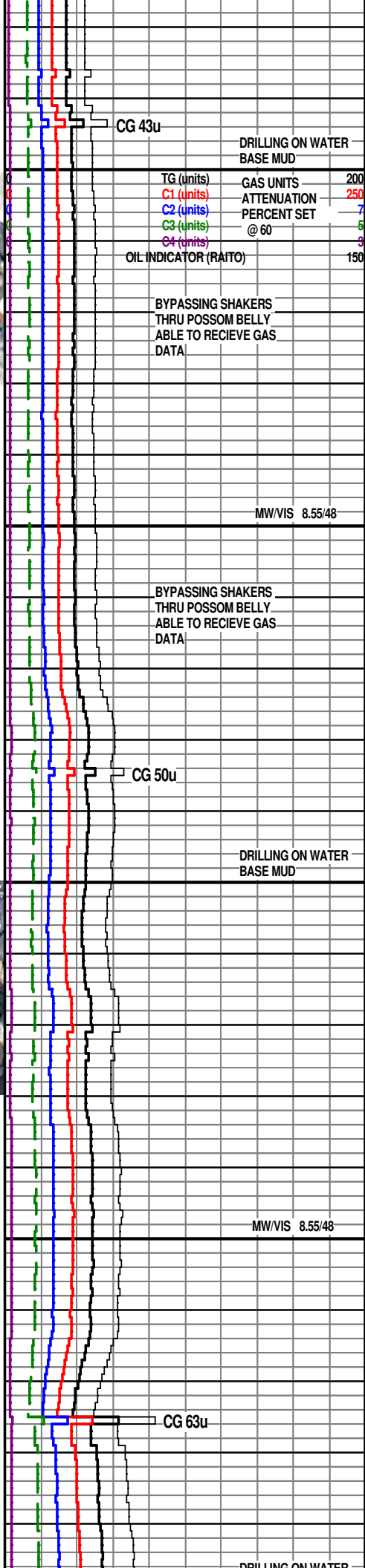
KD  
WOB 24.8  
RPM 63  
PP 1417  
SPM 107

BYPASS SHAKERS

BYPASS SHAKERS

LS: PRED LT TAN- MED TAN, OCC DRK TAN, GRY, SME MITLD TAN, FN/MED, SL/OOL, MICRO-XLN, MOD FRM-FRM, NO VIS FLOR, NO VIS CUT, NO RESD RING, SH: SCAT GRY-LT GRY, SME DRK GRY, SCAT REDISH BRN, SMTH-SUB WXY TXT, MOD SFT-MOD FRM, PRED BLKY-PLTY, NO VIS FLOR, NO VIS CUT, NO RESD RING

LS: PRED LT TAN- MED TAN, OCC DRK TAN, GRY, SME MITLD TAN, FN/MED, SL/OOL, MICRO-XLN, MOD FRM-FRM, NO VIS FLOR, NO VIS CUT, NO RESD RING, SH: SCAT GRY-LT GRY, SME DRK GRY, SCAT REDISH BRN, SMTH-SUB WXY TXT, MOD SFT-MOD FRM, PRED BLKY-PLTY, NO VIS FLOR, NO VIS CUT, NO RESD RING



CG 43u

DRILLING ON WATER  
BASE MUD

TG (units) 200  
C1 (units) 250  
C2 (units) 7  
C3 (units) 5  
C4 (units) 3  
OIL INDICATOR (RAITO) 150

GAS UNITS  
ATTENUATION  
PERCENT SET  
@ 60

BYPASSING SHAKERS  
THRU POSSOM BELLY  
ABLE TO RECIEVE GAS  
DATA

MW/VIS 8.55/48

BYPASSING SHAKERS  
THRU POSSOM BELLY  
ABLE TO RECIEVE GAS  
DATA

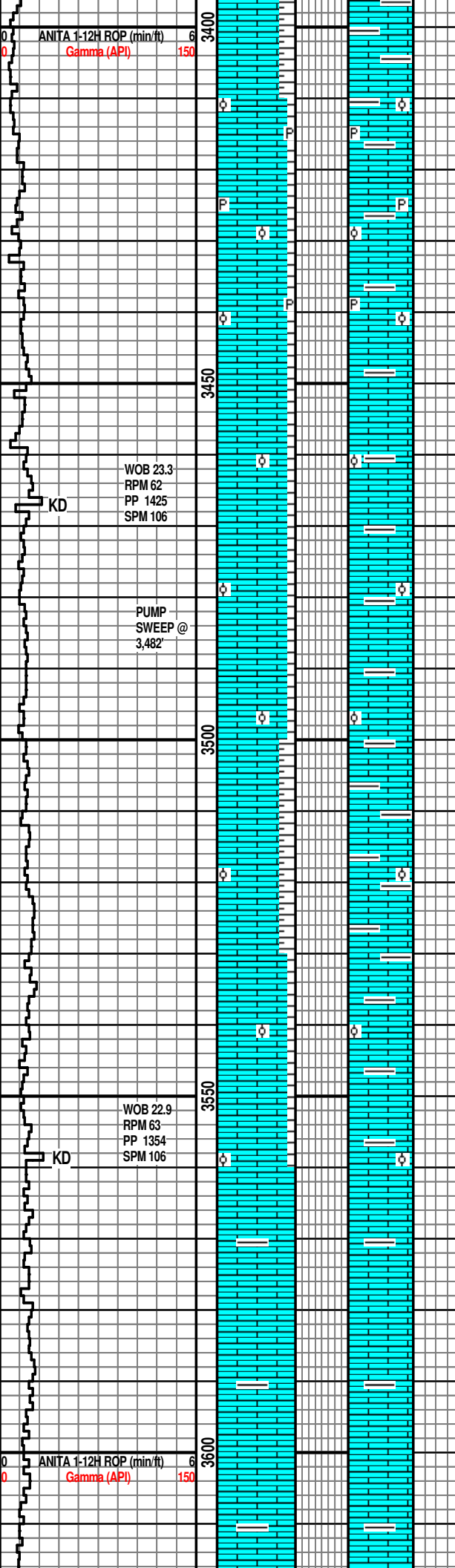
CG 50u

DRILLING ON WATER  
BASE MUD

MW/VIS 8.55/48

CG 63u

DRILLING ON WATER



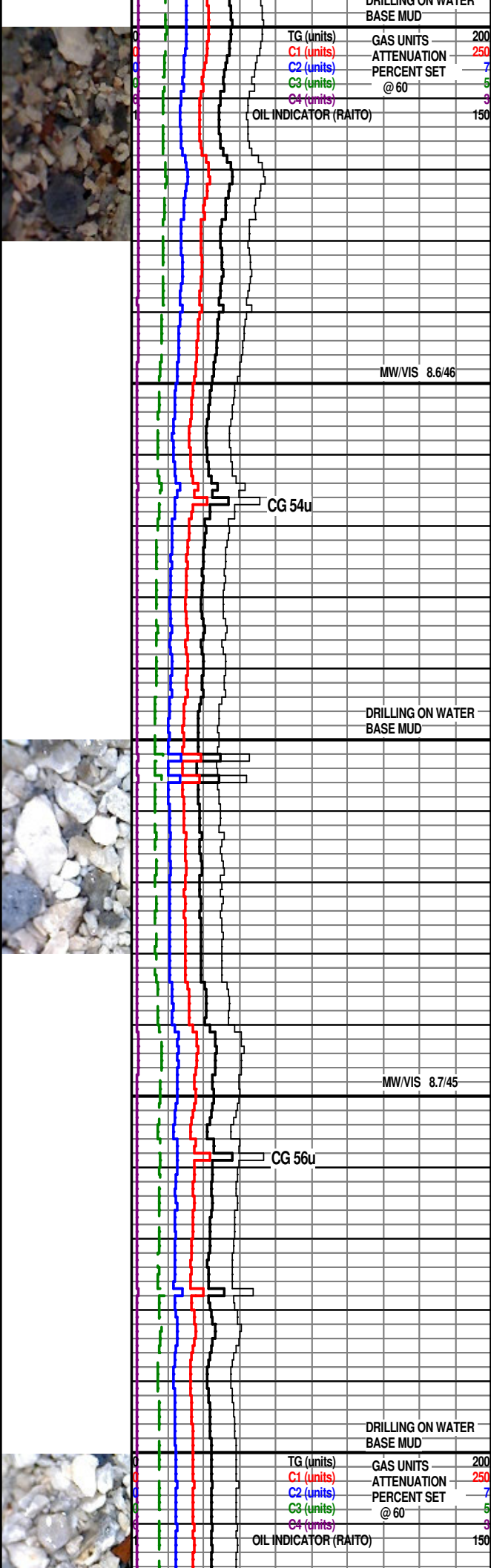
LS: PRED LT TAN- MED TAN, OCC DRK TAN, GRY, SME MTTLD TAN, FN/MED, SL/OOL, MICRO-XLN, MOD FRM-FRM, NO VIS FLOR, NO VIS CUT, NO RESD RING, SH: SCAT GRY-LT GRY, SME DRK GRY, SCAT REDISH BRN, SMTH-SUB WXY TXT, MOD SFT-MOD FRM, PRED BLKY-PLTY, TRS PRY, NO VIS FLOR, NO VIS CUT, NO RESD RING

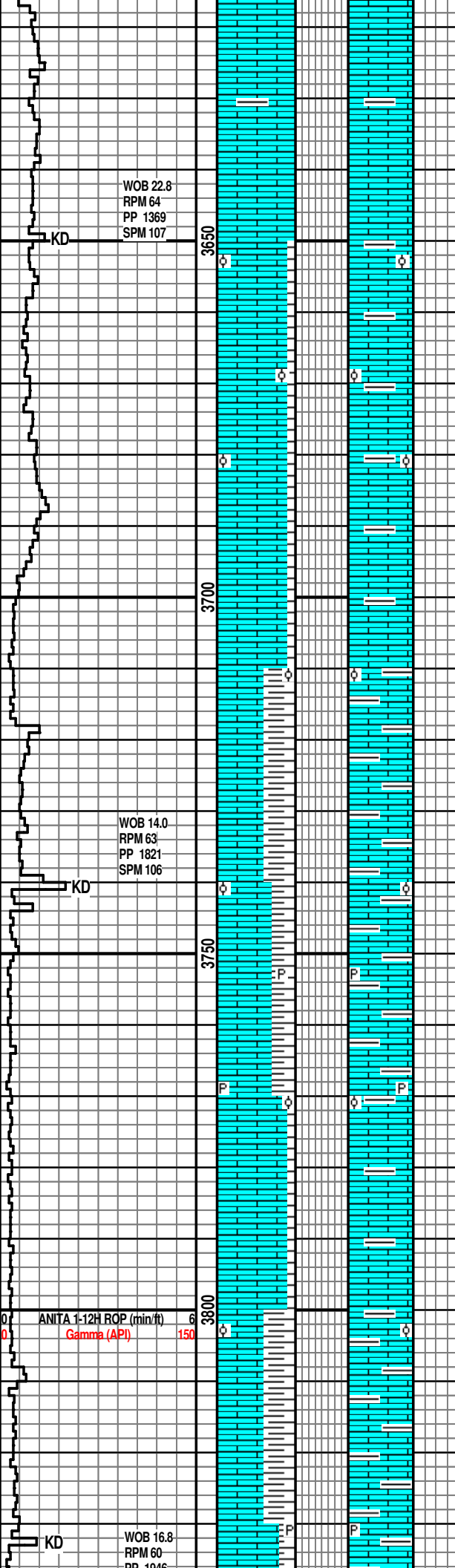
LS: PRED LT TAN- MED TAN, OCC DRK TAN, GRY, SME MTTLD TAN, FN/MED, SL/OOL, MICRO-XLN, MOD FRM-FRM, NO VIS FLOR, NO VIS CUT, NO RESD RING, SH: SCAT GRY-LT GRY, SME DRK GRY, SCAT REDISH BRN, SMTH-SUB WXY TXT, MOD SFT-MOD FRM, PRED BLKY-PLTY, NO VIS FLOR, NO VIS CUT, NO RESD RING

LS: PRED LT TAN- MED TAN, OCC DRK TAN, GRY, SME MTTLD TAN, FN/MED, SL/OOL, MICRO-XLN, MOD FRM-FRM, NO VIS FLOR, NO VIS CUT, NO RESD RING, SH: SCAT GRY-LT GRY, SME DRK GRY, SCAT REDISH BRN, SMTH-SUB WXY TXT, MOD SFT-MOD FRM, PRED BLKY-PLTY, NO VIS FLOR, NO VIS CUT, NO RESD RING

LS: PRED LT TAN- MED TAN, OCC DRK TAN, GRY, SME MTTLD TAN, FN/MED, SH: SCAT GRY-LT GRY, SME DRK GRY, SCAT REDISH BRN, SMTH-SUB WXY TXT, MOD SFT-MOD FRM, PRED BLKY-PLTY, NO VIS FLOR, NO VIS CUT, NO RESD RING

LS: PRED LT TAN- MED TAN, OCC DRK TAN, GRY, SME MTTLD TAN, FN/MED, SH: SCAT GRY-LT GRY, SME DRK GRY, SCAT REDISH BRN, SMTH-SUB WXY TXT, MOD SFT-MOD FRM, PRED BLKY-PLTY, NO VIS FLOR, NO VIS CUT, NO RESD RING





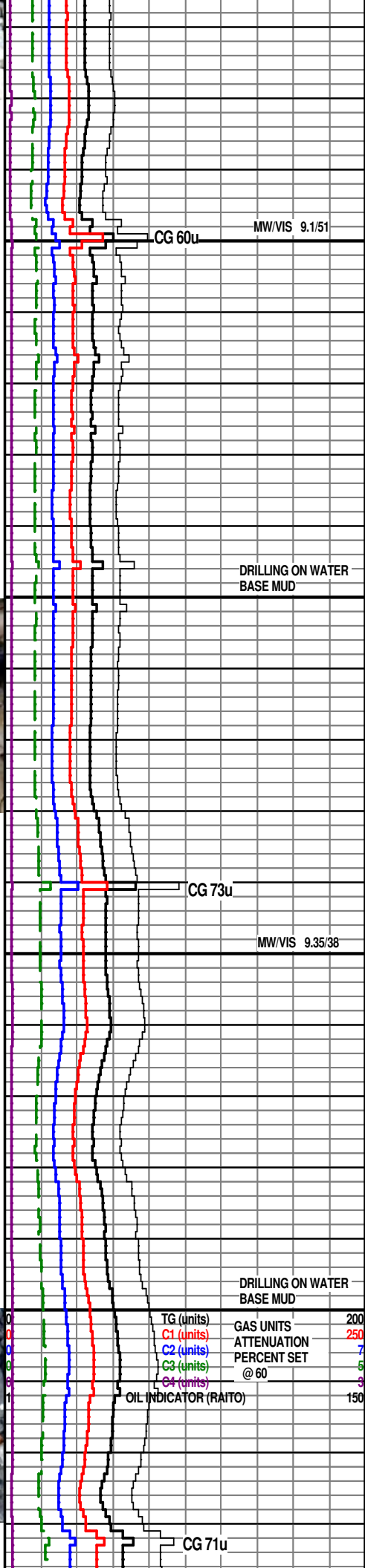
LS: PRED LT TAN- MED TAN, OCC DRK TAN, GRY, SME MTTLD TAN, FN/MED, SL/OOL, MICRO-XLN, MOD FRM-FRM, NO VIS FLOR, NO VIS CUT, NO RESD RING, SH: SCAT GRY-LT GRY, SME DRK GRY, SCAT REDISH BRN, SMTH-SUB WXY TXT, MOD SFT-MOD FRM, PRED BLKY-PLTY, NO VIS FLOR, NO VIS CUT, NO RESD RING

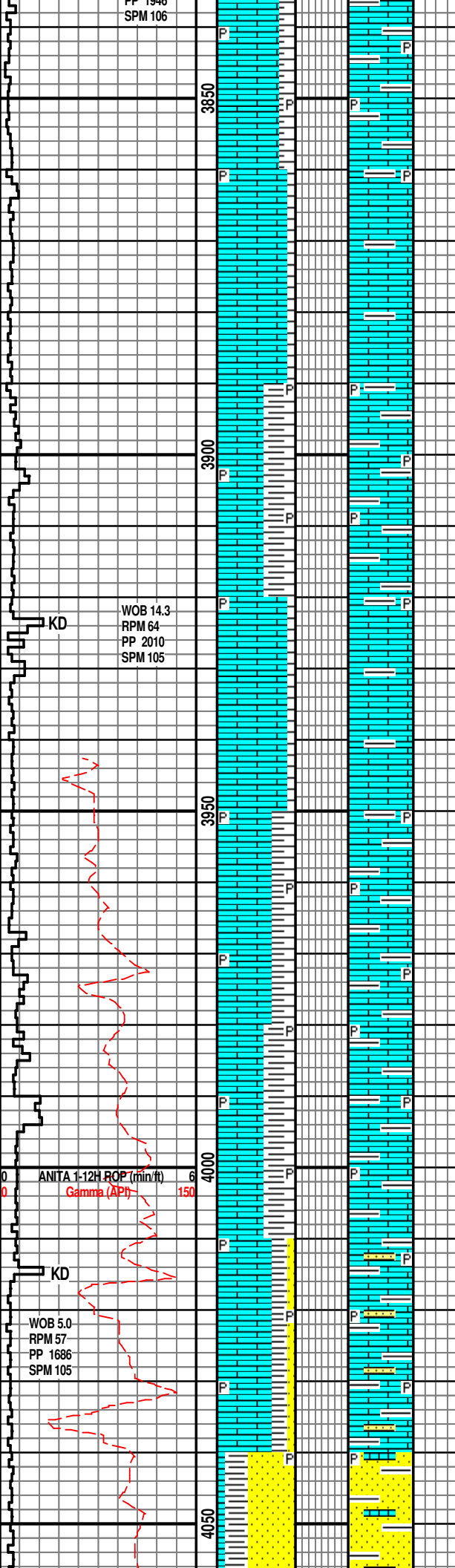
SURVEY: 3,685' MD 3,685' TVD  
INC. 1.10 / AZ. 56.80

LS: WHT-OFF WHT, LT-MED GY, CRP-XLN, BLKY, CHUKY, MOD FRM TO HD, SME FN-MED XLN, SL/OOL, SL/DNS, NO VIS FLOR, NO VIS CUT, NO RESD RING, SH: ABUN GRY-LT GRY, SME DRK GRY, SCAT REDISH BRN, SMTH-SUB WXY TO RGH TXT, SFT TO MOD SFT-MOD FRM, PRED BLKY-PLTY

SH: ABUN GRY-LT GRY, SME DRK GRY, SCAT REDISH BRN, SMTH-SUB WXY TO RGH TXT, SFT TO MOD SFT-MOD FRM, PRED BLKY-PLTY, TRS PYR, LS: WHT-OFF WHT, LT-MED GY, CRP-XLN, BLKY, CHUKY, MOD FRM TO HD, SME FN-MED XLN, SL/OOL, SL/DNS, NO VIS FLOR, NO VIS CUT, NO RESD RING

LS: WHT-OFF WHT, LT-MED GY, CRP-XLN, BLKY, CHUKY, MOD FRM TO HD, SME FN-MED XLN, SL/OOL, SL/DNS, NO VIS FLOR, NO VIS CUT, NO RESD RING, SH: ABUN GRY-LT GRY, SME DRK GRY, SCAT REDISH BRN, SMTH-SUB WXY TO RGH TXT, SFT TO MOD SFT-MOD FRM, PRED BLKY-PLTY, TRS PYR





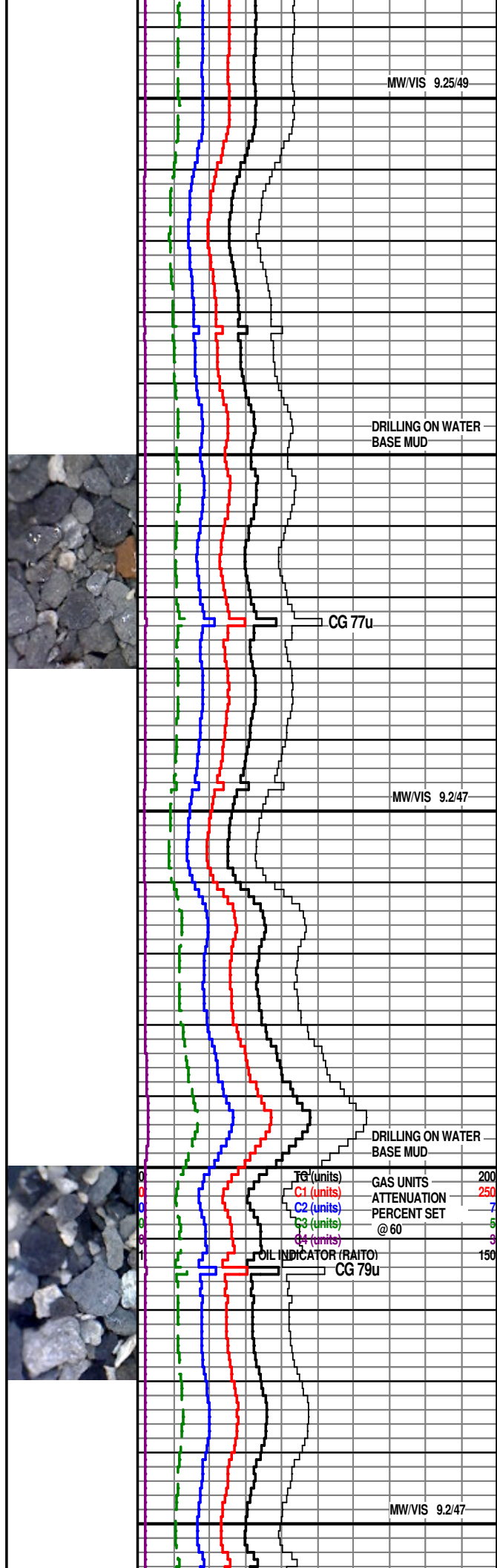
LS: WHT-OFF WHT, LT-MED GY, CRP-XLN, SNDY, BLKY, CHUKY, MOD FRM TO HD, SME FN-MED XLN, SL/OOL, SL/DNS, NO VIS FLOR, NO VIS CUT, NO RESD RING, SH: ABUN GRY-LT GRY, SME DRK GRY, SCAT REDISH BRN, SMTH-SUB WXY TO RGH TXT, SFT TO MOD SFT-MOD FRM, PRED BLKY-PLTY, TRS PYR

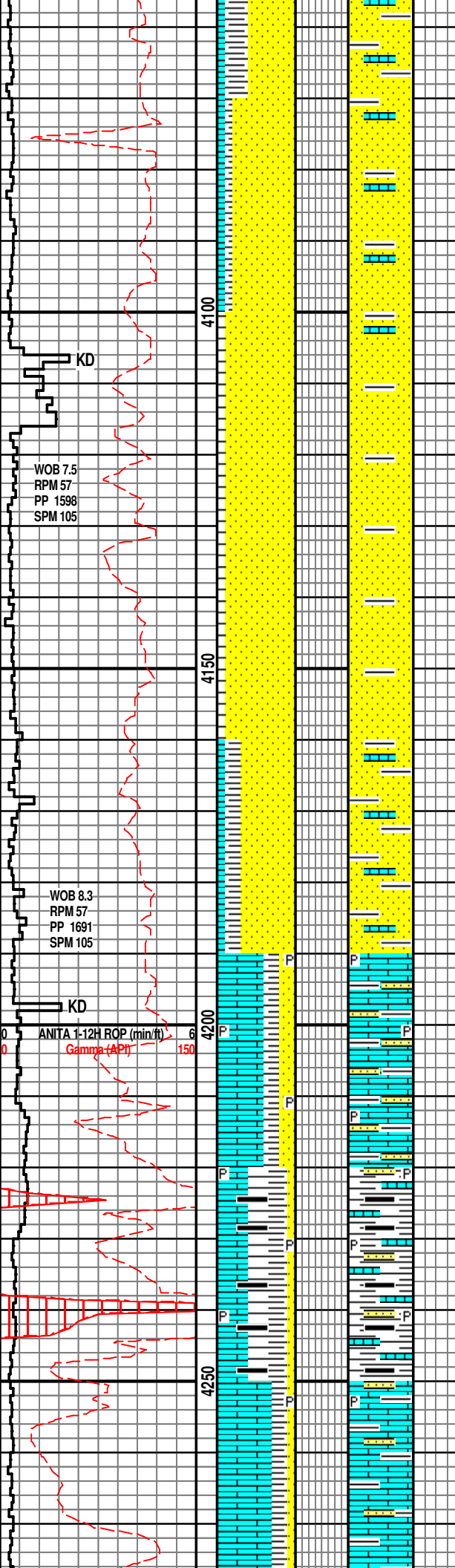
LS: WHT-OFF WHT, LT-MED GY, CRP-XLN, SNDY, BLKY, CHUKY, MOD FRM TO HD, SME FN-MED XLN, SL/OOL, SL/DNS, NO VIS FLOR, NO VIS CUT, NO RESD RING, SH: ABUN GRY-LT GRY, SME DRK GRY, SCAT REDISH BRN, SMTH-SUB WXY TO RGH TXT, SFT TO MOD SFT-MOD FRM, PRED BLKY-PLTY, TRS PYR

LS: WHT-OFF WHT, LT-MED GY, CRP-XLN, SNDY, BLKY, CHUKY, MOD FRM TO HD, SME FN-MED XLN, SL/OOL, SL/DNS, NO VIS FLOR, NO VIS CUT, NO RESD RING, SH: ABUN GRY-LT GRY, SME DRK GRY, SCAT REDISH BRN, SMTH-SUB WXY TO RGH TXT, SFT TO MOD SFT-MOD FRM, PRED BLKY-PLTY, TRS PYR

LS: WHT-OFF WHT, LT-MED GY, CRP-XLN, SNDY, BLKY, CHUKY, MOD FRM TO HD, SME FN-MED XLN, SL/OOL, SL/DNS, NO VIS FLOR, NO VIS CUT, NO RESD RING, SH: ABUN GRY-LT GRY, SME DRK GRY, SCAT REDISH BRN, SMTH-SUB WXY TO RGH TXT, SFT TO MOD SFT-MOD FRM, PRED BLKY-PLTY, TRS PYR, SS: OFF WHT TO WHT, MOSTLY LT-MED GRY, VF GRN, W/CONSOL, MOD HD, CALC CMT, SUB-ANG, SUB RND, SL/TRS FREE QTZ, NO STN

SS: OFF WHT TO WHT, MOSTLY LT-MED GRY, VF GRN, W/CONSOL, MOD HD, CALC CMT, SUB-ANG, SUB RND, SL/TRS FREE QTZ, NO STN, SH: ABUN GRY-LT GRY, SME DRK GRY, SCAT REDISH BRN, SMTH-SUB WXY TO RGH TXT, SFT TO MOD SFT-MOD FRM, PRED BLKY-PLTY, LS: WHT-OFF WHT, LT-MED GY, CRP-XLN, SNDY, BLKY, CHUKY, MOD FRM TO HD, SME FN-MED XLN, SL/OOL, SL/DNS, NO VIS FLOR, NO VIS CUT, NO RESD RING, SH: ABUN GRY-LT GRY, SME DRK GRY, SCAT REDISH BRN, SMTH-SUB WXY TO RGH TXT, SFT TO MOD SFT-MOD FRM, PRED BLKY-PLTY, TRS PYR





WOB 7.5  
RPM 57  
PP 1598  
SPM 105

WOB 8.3  
RPM 57  
PP 1691  
SPM 105

ANITA 1-12H ROP (min/ft)  
Gamma (API) 150

SS: OFF WHT TO WHT, MOSTLY LT-MED GRY, VF GRN, W/CONSOL, MOD HD, CALC CMT, SUB-ANG, SUB RND, SL/TRS FREE QTZ, NO STN, SH: ABUN GRY-LT GRY, SME DRK GRY, SCAT REDISH BRN, SMTH-SUB WXY TO RGH TXT, SFT TO MOD SFT-MOD FRM, PRED BLKY-PLTY

SS: OFF WHT TO WHT, MOSTLY LT-MED GRY, VF GRN, W/CONSOL, MOD HD, CALC CMT, SUB-ANG, SUB RND, SL/TRS FREE QTZ, NO STN, SH: ABUN GRY-LT GRY, SME DRK GRY, SCAT REDISH BRN, SMTH-SUB WXY TO RGH TXT, SFT TO MOD SFT-MOD FRM, PRED BLKY-PLT

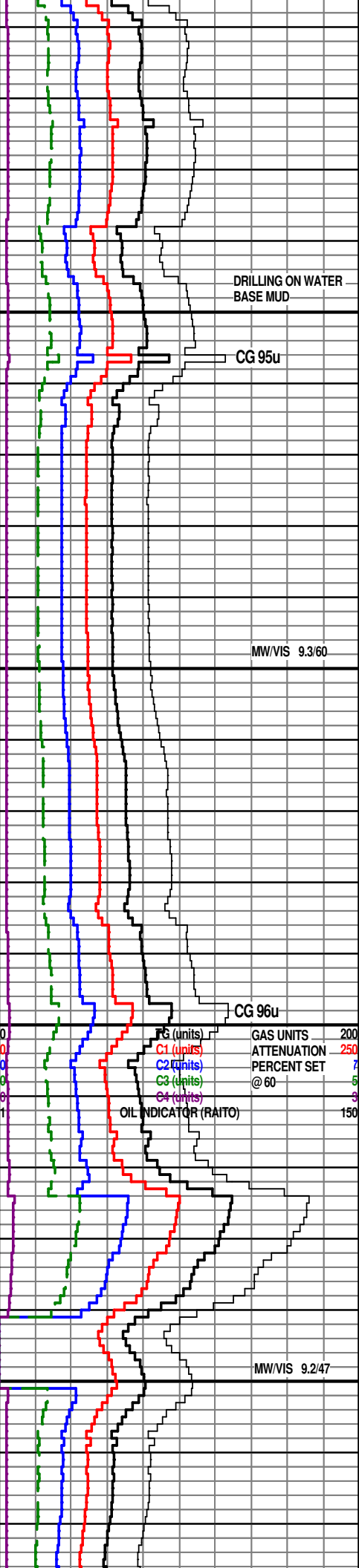
SURVEY: 4,142' MD 4,141' TVD  
INC. 0.40 / AZ. 93.30

SS: OFF WHT TO WHT, MOSTLY LT-MED GRY, VF GRN, W/CONSOL, MOD HD, CALC CMT, SUB-ANG, SUB RND, SL/TRS FREE QTZ, NO STN, SH: ABUN GRY-LT GRY, SME DRK GRY, SCAT REDISH BRN, SMTH-SUB WXY TO RGH TXT, SFT TO MOD SFT-MOD FRM, PRED BLKY-PLTY, LS: WHT-OFF WHT, LT-MED GY, CRP-XLN, SNDY, BLKY, CHUKY, MOD FRM TO HD, SME FN-MED XLN, SL/OOL, SL/DNS, NO VIS FLOR, NO VIS CUT, NO RESD RING

**BASE HEEBNER SHALE**  
4,225' MD/TVD 4,224'

SH: DK GRY, BLK GRY, SCAT LT GRY, SME RED, ORG RCH, CALC, SPLTY, INCRS BLK CARB, SMTH- SUB WXY LSTR, MOD FRM-FRM, TRS PYR, SS: OFF WHT TO WHT, MOSTLY LT-MED GRY, VF GRN, W/CONSOL, SUBRND, MOD HD, CALC CMT, SUB-ANG, SUB RND, LS: PRED LT TAN- MED TAN, OCC DRK TA, CRM, SME MTTLD TAN FN-MED XLN, MOD FRM-FRM, NO VIS FLOR, NO VIS CUT, NO RESD RING

SURVEY: 4,270' MD 4,269' TVD  
INC. 0.50 / AZ. 73.70



DRILLING ON WATER BASE MUD

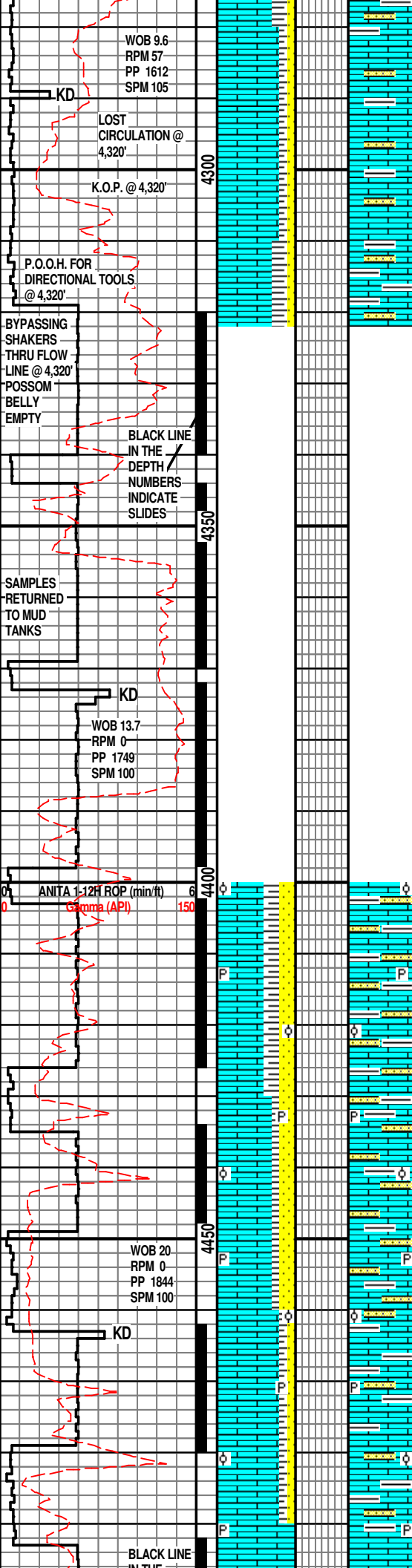
CG 95u

MW/VIS 9.3/60

CG 96u

PG (units) 200  
C1 (units) 250  
C2 (units) 7  
C3 (units) 5  
C4 (units) 3  
OIL INDICATOR (RAITO) 150

MW/VIS 9.2/47



LS: PRED LT TAN- MED TAN, OCC DRK TA, CRM, SME MTTLD TAN FN-MED XLN, MOD FRM-FRM, NO VIS FLOR, NO VIS CUT, NO RESD RING, SH: DK GRY, BLK GRY, SCAT LT GRY, SME RED, CALC, SPLTY, CARB, SMTH- SUB WXY LSTR, MOD FRM-FRM, SS: MOSTLY LT-MED GRY, VF GRN, W/CONSOL, SUBRND, MOD HD, CALC CMT, SUB-ANG, SUB RND, SL/TRS FREE QTZ, NO STN, NO VIS FLOR, NO VIS CUT, NO RESD RING, ADBT LCM

SURVEY: 4,324' MD 4,323' TVD  
INC. 1.40 / AZ. 131.10

**BYPASSING SHAKERS FROM FLOW LINE NO SAMPLES**

SURVEY: 4,354' MD 4,353' TVD  
INC. 3.70 / AZ. 175.20

**BYPASSING SHAKERS FROM FLOW LINE NO SAMPLES**

SURVEY: 4,384' MD 4,383' TVD  
INC. 6.80 / AZ. 180.20

**LANSING LIMESTONE 4,390' MD/TVD 4,390'**

SURVEY: 4,414' MD 4,413' TVD  
INC. 9.90 / AZ. 181.9

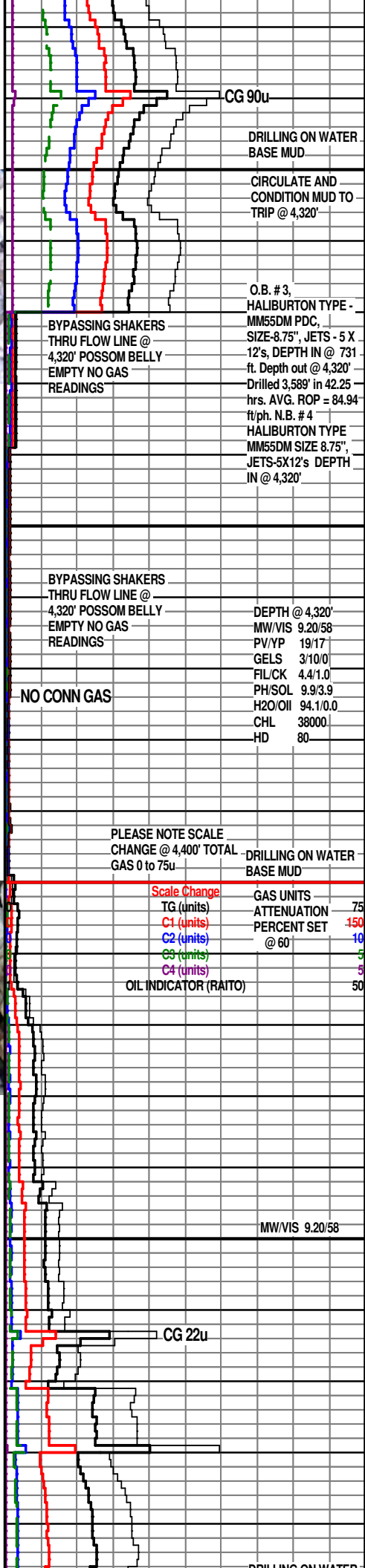
LS: OFF WHT, LT-MED GRY, PRED BLKY, CHNKY, MICRO-XLN, MOD FRM- FRM, OCC BRIT, SME OOL, SH: GY-DRK GY, OCC BLK, SME RED, SPLIN, MOD FRM, SMTH TXT, SS: MED GRY, SME TAN, VF-F GRN, W/CONSOL, SUB-ANG, TRS PYR

SURVEY: 4,445' MD 4,443' TVD  
INC. 12.6 / AZ. 181.6

LS: OFF WHT, LT-MED GRY, PRED BLKY, CHNKY, MICRO-XLN, MOD FRM- FRM, OCC BRIT, SME OOL, SH: GY-DRK GY, OCC BLK, SME RED, SPLIN, MOD FRM, SMTH TXT, SS: MED GRY, SME TAN, VF-F GRN, W/CONSOL, SUB-ANG, TRS PYR

SURVEY: 4,475' MD 4,472' TVD  
INC. 15.2 / AZ. 183.1

LS: OFF WHT, LT-MED GRY, PRED BLKY, CHNKY, MICRO-XLN, MOD FRM- FRM, OCC BRIT, SME OOL, SH: GY-DRK GY, OCC BLK, SME RED, SPLIN, MOD FRM, SMTH TXT, SS: MED GRY, SME TAN,



CG 90u  
DRILLING ON WATER  
BASE MUD

CIRCULATE AND  
CONDITION MUD TO  
TRIP @ 4,320'

O.B. #3,  
HALIBURTON TYPE -  
MM55DM PDC,  
SIZE-8.75", JETS - 5 X  
12's, DEPTH IN @ 731  
ft. Depth out @ 4,320'  
Drilled 3,589' in 42.25  
hrs. AVG. ROP = 84.94  
ft/ph. N.B. #4  
HALIBURTON TYPE  
MM55DM SIZE 8.75",  
JETS-5X12's DEPTH  
IN @ 4,320'

DEPTH @ 4,320'  
MW/VIS 9.20/58  
PV/YP 19/17  
GELS 3/10/0  
FIL/CK 4.4/1.0  
PH/SOL 9.9/3.9  
H2O/OIL 94.1/0.0  
CHL 38000  
HD 80

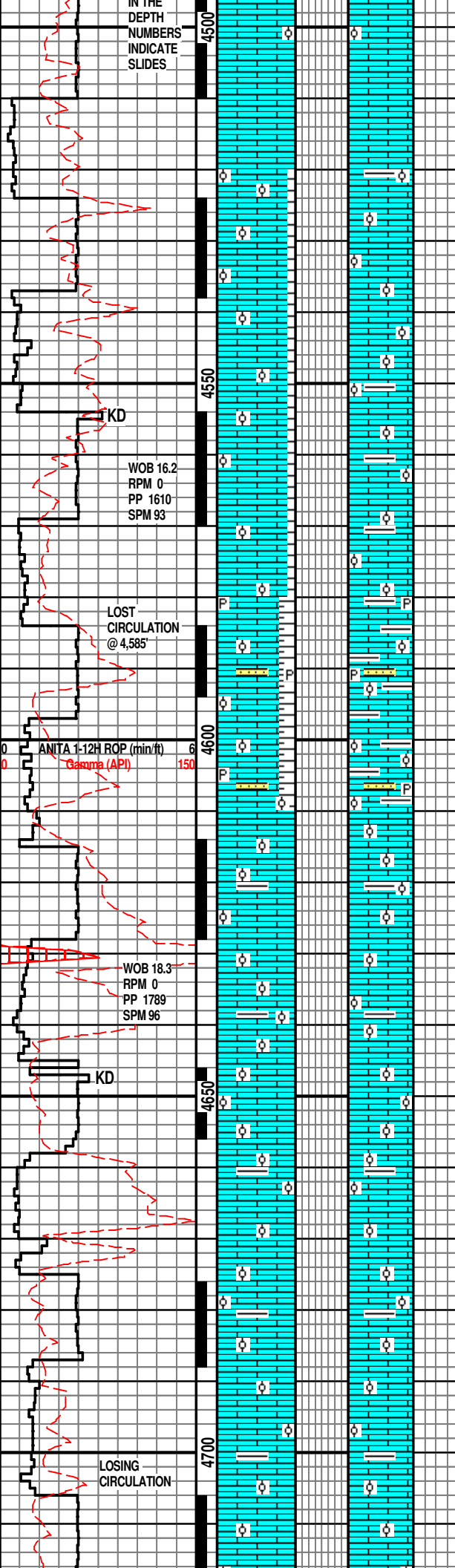
PLEASE NOTE SCALE  
CHANGE @ 4,400' TOTAL  
GAS 0 to 75u -DRILLING ON WATER  
BASE MUD

Scale Change  
TG (units) 75  
C1 (units) 150  
C2 (units) 10  
C3 (units) 5  
C4 (units) 5  
OIL INDICATOR (RAITO) 50

MW/VIS 9.20/58

CG 22u

DRILLING ON WATER



VF-F GRN, W/CONSOL, SUB-ANG, TRS PYR

SURVEY: 4,505' MD 4,501' TVD  
INC. 17.7 / AZ. 183.8

LS: OFF WHT, LT-MED GRY, PRED BLKY, CHNKY, MICRO-XLN, MOD FRM- FRM, OCC BRIT, V/OOL, SH: GY-DRK GY, OCC BLK, SME RED, SPLIN, MOD FRM, SMTH TXT, NO CUT NO RING

SURVEY: 4,536' MD 4,530' TVD  
INC. 19.8 / AZ. 181.9

LS: OFF WHT, LT-MED GRY, PRED BLKY, CHNKY, MICRO-XLN, MOD FRM- FRM, OCC BRIT, V/OOL, SH: GY-DRK GY, OCC BLK, SME RED, SPLIN, MOD FRM, SMTH TXT, NO CUT NO RING

SURVEY: 4,566' MD 4,558' TVD  
INC. 21.8 / AZ. 179.8

LS: MSTLY MED TAN- LT TAN, SME OFF WHT, PRED BLKY, CHNKY, MICRO-XLN, MOD FRM- FRM, OCC BRIT, V/OOL, SH: GY-DRK GY, OCC BLK, SME RED, SPLIN, MOD FRM, SMTH TXT, TRS SS: LT-MED GRY, WHT, VF-F GRN, W/CONSOL, SUB-ANG, HD, TRS PYR, ABDT LCM

SURVEY: 4,597' MD 4,587' TVD  
INC. 23.9 / AZ. 179.4

LS: MSTLY MED TAN- LT TAN, SME OFF WHT, PRED BLKY, CHNKY, MICRO-XLN, MOD FRM- FRM, OCC BRIT, V/OOL, TRS SH: GY-DRK GY, OCC BLK, SME RED, SPLIN, MOD FRM, SMTH TXT, NO CUT NO RING, ABDT LCM

SURVEY: 4,627' MD 4,615' TVD  
INC. 25.5 / AZ. 179.4

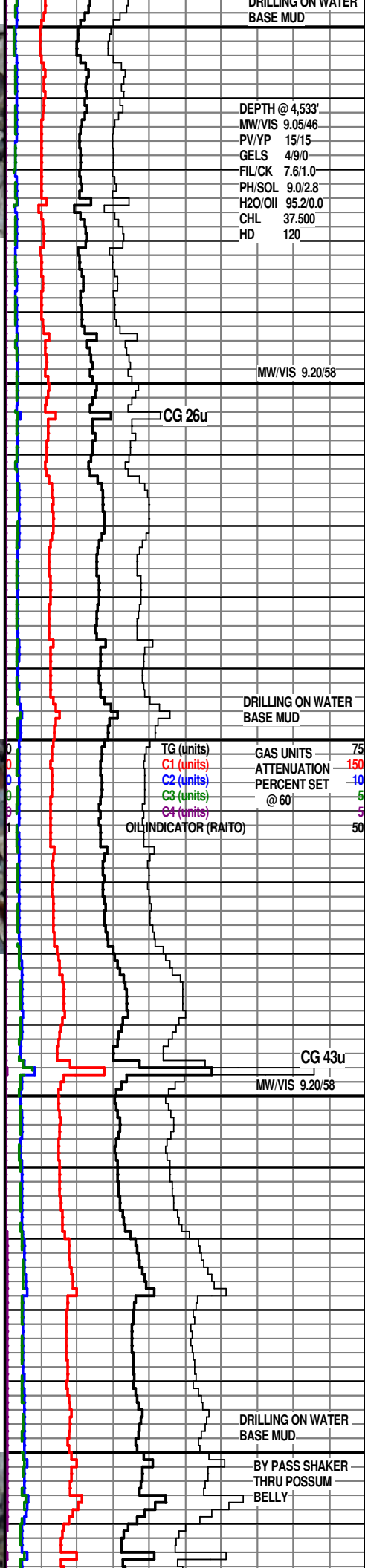
LS: MSTLY MED TAN- LT TAN, SME OFF WHT, PRED BLKY, CHNKY, MICRO-XLN, MOD FRM- FRM, OCC BRIT, V/OOL, TRS SH: GY-DRK GY, OCC BLK, SME RED, SPLIN, MOD FRM, SMTH TXT, NO CUT NO RING, ABDT LCM

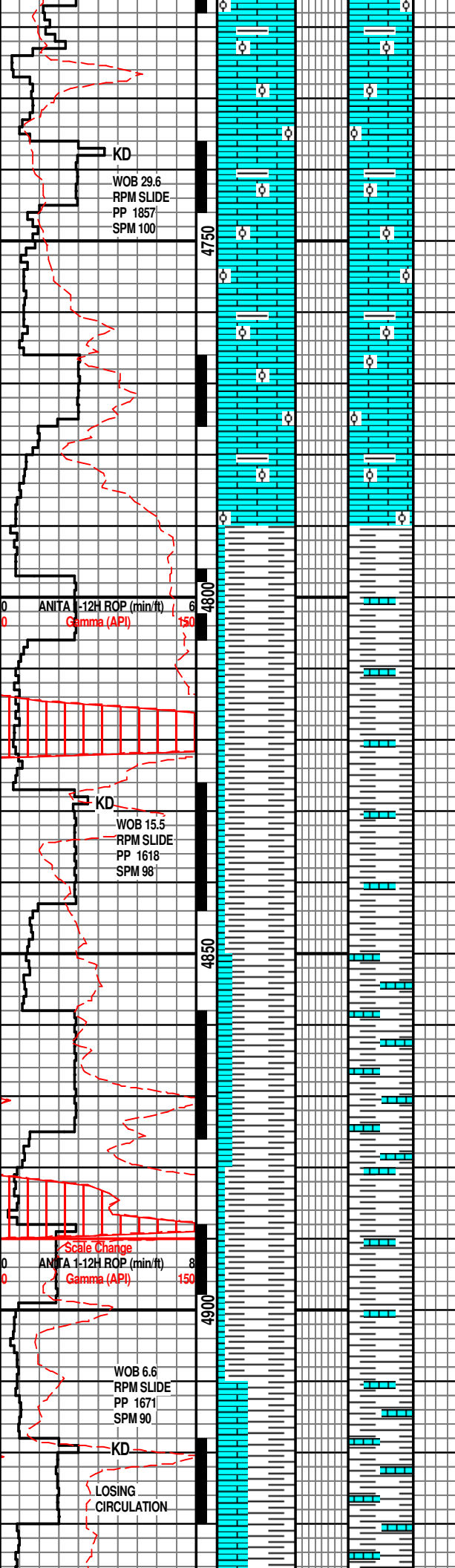
SURVEY: 4,657' MD 4,642' TVD  
INC. 27.2 / AZ. 179.4

LS: MSTLY MED TAN- LT TAN, SME OFF WHT, PRED BLKY, CHNKY, MICRO-XLN, MOD FRM- FRM, OCC BRIT, V/OOL, TRS SH: GY-DRK GY, OCC BLK, SME RED, SPLIN, MOD FRM, SMTH TXT, NO CUT NO RING, ABDT LCM

SURVEY: 4,688' MD 4,669' TVD  
INC. 29.3 / AZ. 178.8

LS: MSTLY MED TAN- LT TAN, SME OFF WHT, PRED BLKY, CHNKY, MICRO-XLN, MOD FRM- FRM, OCC BRIT, V/OOL, TRS SH: GY-DRK GY, OCC BLK, SME RED, SPLIN, MOD FRM, SMTH TXT, NO CUT NO RING, ABDT LCM





SURVEY: 4,718' MD 4,695' TVD  
INC. 31.2 / AZ. 178.7  
LS: MSTLY MED TAN- LT TAN,  
SME OFF WHT, PRED BLKY, CHNKY,  
MICRO-XLN, MOD FRM- FRM, OCC BRIT,  
V/OOL, TRS SH: GY-DRK GY, OCC BLK,  
SME RED, SPLIN, MOD FRM, SMTH TXT,  
NO CUT NO RING, ABDT LCM

SURVEY: 4,748' MD 4,720' TVD  
INC. 32.6 / AZ. 179.8  
LS: MSTLY DARK, PRED BLKY, CHNKY,  
MICRO-XLN, MOD FRM- FRM, OCC BRIT,  
V/OOL, TRS SH: GY-DRK GY, OCC BLK,  
SME RED, SPLIN, MOD FRM, SMTH TXT,  
NO CUT NO RING, ABDT LCM

SURVEY: 4,779' MD 4,746' TVD  
INC. 32.9 / AZ. 180.4  
LS: OFF WHT/WHT, PRED BLKY, CHNKY,  
MICRO-XLN, MOD FRM- FRM, OCC BRIT,  
SH: GY-DRK GY, BLK, SPLIN, SFT- MOD  
FRM, RGH TXT, BLKY, SL/EMBD LS, NO  
CUT NO RING, ABDT LCM

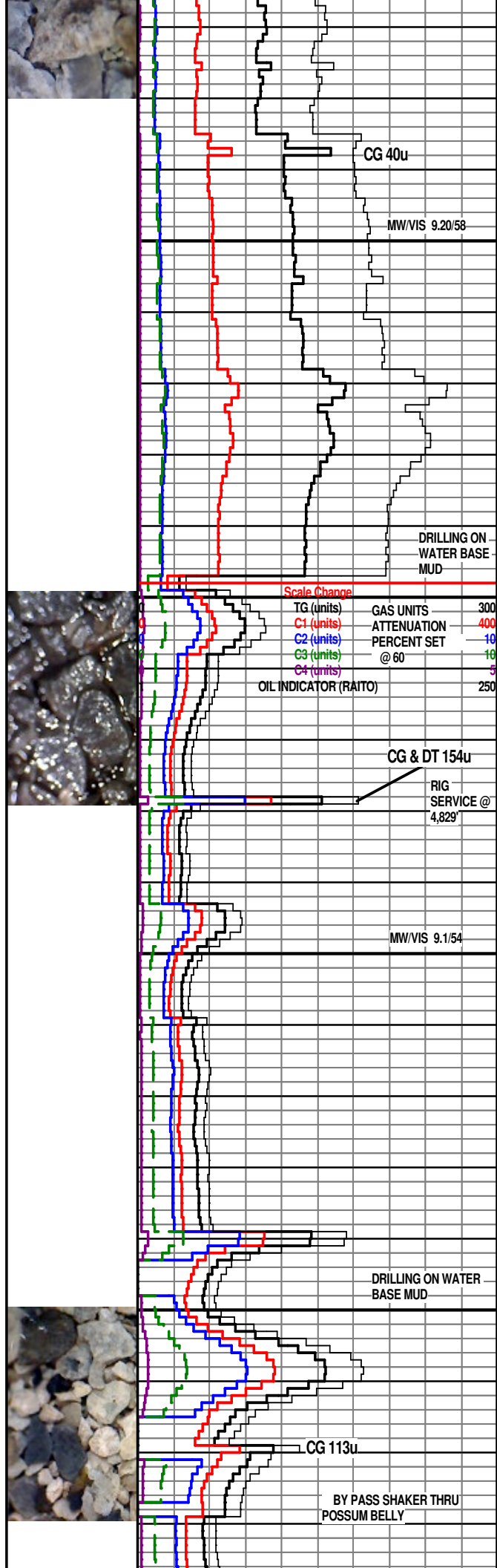
SURVEY: 4,809' MD 4,771' TVD  
INC. 33.6 / AZ. 179.1  
LS: OFF WHT/WHT, PRED BLKY, CHNKY,  
MICRO-XLN, MOD FRM- FRM, OCC BRIT,  
SH: GY-DRK GY, BLK, SPLIN, SFT- MOD  
FRM, RGH TXT, BLKY, SL/EMBD LS, NO  
CUT NO RING, ABDT LCM

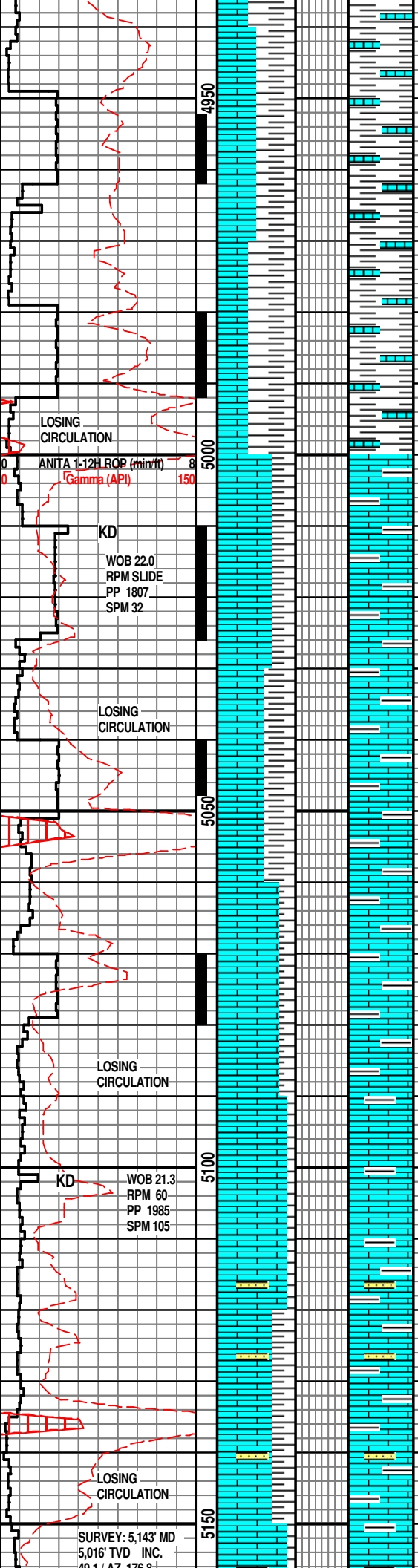
SURVEY: 4,839' MD 4,796' TVD  
INC. 35.1 / AZ. 178.8  
LS: OFF WHT/WHT, PRED BLKY, CHNKY,  
MICRO-XLN, MOD FRM- FRM, OCC BRIT,  
SH: GY-DRK GY, BLK, SPLIN, SFT- MOD  
FRM, RGH TXT, BLKY, SL/EMBD LS, NO  
CUT NO RING, ABDT LCM

SURVEY: 4,870' MD 4,821' TVD  
INC. 37.1 / AZ. 178.7  
LS: OFF WHT/WHT, PRED BLKY, CHNKY,  
MICRO-XLN, MOD FRM- FRM, OCC BRIT,  
SH: GY-DRK GY, BLK, SPLIN, SFT- MOD  
FRM, RGH TXT, BLKY, SL/EMBD LS, NO  
CUT NO RING, ABDT LCM

SURVEY: 4,900' MD 4,845' TVD  
INC. 38.7 / AZ. 178.1  
LS: OFF WHT/WHT, PRED BLKY, CHNKY,  
MICRO-XLN, MOD FRM- FRM, OCC BRIT,  
SH: GY-DRK GY, BLK, SPLIN, SFT- MOD  
FRM, RGH TXT, BLKY, SL/EMBD LS, NO  
CUT NO RING, ABDT LCM

SURVEY: 4,930' MD 4,868' TVD  
INC. 40.1 / AZ. 177.9





LS: OFF WHT/WHT, PRED BLKY, CHNKY, MICRO-XLN, MOD FRM- FRM, OCC BRIT, SH: GY-DRK GY, BLK, SPLIN, SFT- MOD FRM, RGH TXT, BLKY, SL/EMBD LS, NO CUT, NO RING, ABDT LCM

SURVEY: 4,961' MD 4,892' TVD  
INC. 41.6 / AZ. 177.2

LS: OFF WHT/WHT, PRED BLKY, CHNKY, MICRO-XLN, MOD FRM- FRM, OCC BRIT, SH: GY-DRK GY, BLK, SPLIN, SFT- MOD FRM, RGH TXT, BLKY, SL/EMBD LS, NO CUT, NO RING, ABDT LCM

SURVEY: 4,991' MD 4,914' TVD  
INC. 43.7 / AZ. 177.1

LS: OFF WHT/WHT, PRED BLKY, CHNKY, MICRO-XLN, MOD FRM- FRM, OCC BRIT, SH: GY-DRK GY, BLK, SPLIN, SFT- MOD FRM, RGH TXT, BLKY, SL/EMBD LS, NO CUT, NO RING, ABDT LCM

SURVEY: 5,022' MD 4,936' TVD  
INC. 46.1 / AZ. 177.2

LS: OFF WHT/WHT, PRED BLKY, CHNKY, MICRO-XLN, MOD FRM- FRM, OCC BRIT, SH: GY-DRK GY, BLK, SPLIN, SFT- MOD FRM, RGH TXT, BLKY, SL/EMBD LS, NO CUT, NO RING, ABDT LCM

SURVEY: 5,052' MD 4,956' TVD  
INC. 47.3 / AZ. 177.3

LS: OFF WHT/WHT, PRED BLKY, CHNKY, MICRO-XLN, MOD FRM- FRM, OCC BRIT, SH: GY-DRK GY, BLK, SPLIN, SFT- MOD FRM, RGH TXT, BLKY, SL/EMBD LS, NO CUT, NO RING, ABDT LCM

SURVEY: 5,083' MD 4,977' TVD  
INC. 48.6 / AZ. 177.2

LS: OFF WHT/WHT, PRED BLKY, CHNKY, MICRO-XLN, MOD FRM- FRM, OCC BRIT, SH: GY-DRK GY, BLK, SPLIN, SFT- MOD FRM, RGH TXT, BLKY, SL/EMBD LS, NO CUT, NO RING, ABDT LCM

SURVEY: 5,113' MD 4,997' TVD  
INC. 49.0 / AZ. 177.2

LS: OFF WHT/WHT, PRED BLKY, CHNKY, MICRO-XLN, MOD FRM- FRM, OCC BRIT, SH: GY-DRK GY, BLK, SPLIN, SFT- MOD FRM, RGH TXT, BLKY, SL/EMBD LS, ABDT LCM

**OSWEGO LIMESTONE  
5,134' MD/TVD 5,010'**

LS: OFF WHT TO LT-MED GRY TO DK GRY, SLI -FRM TO FRM, MOD HD, MSUC, MXLN, DNS, SUB-CHKY, BLKY, W-SL/TRS EMBD SHALE, SH: LT GRY TO GRY, FN-TXT FRM TO MOD FRM, CARR. DUJI

MW/VIS 9.2/48

GAS UNITS  
ATTENUATION  
PERCENT SET  
@ 60

BY PASS SHAKER THRU  
POSSUM BELLY

DRILLING ON WATER  
BASE MUD

TG (units)	GAS UNITS	300
C1 (units)	ATTENUATION	400
C2 (units)	PERCENT SET	-10
C3 (units)	@ 60	10
C4 (units)		5
OIL INDICATOR (RAITO)	CG 86u	250



BY PASS SHAKER THRU  
POSSUM BELLY

MW/VIS 9.25/40

BY PASS SHAKER THRU  
POSSUM BELLY

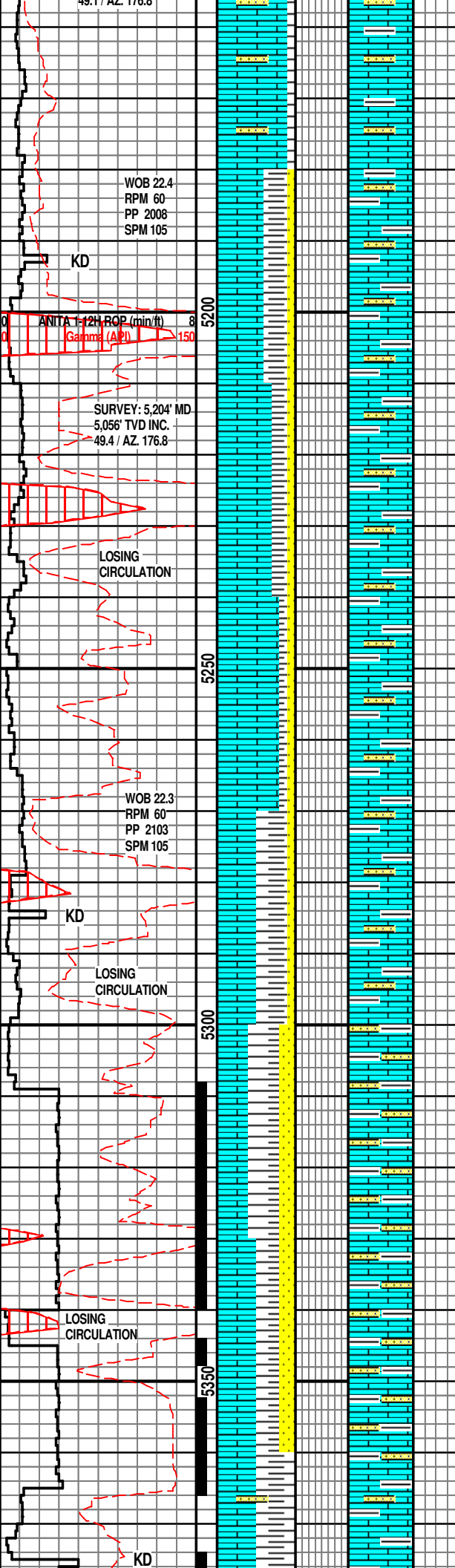
DRILLING ON WATER  
BASE MUD



CG 108u

BY PASS SHAKER THRU  
POSSUM BELLY

MW/VIS 9.25/40



BLKY TO PLTY, TRS EMBD PYR, SLI YELL FLUOR, CUT, RING OR ODOR

SURVEY: 5,174' MD 5,037' TVD  
INC. 49.3 / AZ. 176.6

LS: OFF WHT TO LT-MED GRY TO DK GRY, SLI- FRM TO FRM, MSUC, MICRO-XLN, DNS, SUB-CHKY, SH: LT GRY TO GRY, FN TXT, FRM, SPLIN, SS: WHT, LT GRY VF-F GRN, W/SRT, SUB-ANG, MOD HD, SME CALC CMT, NO FLUOR, NO CUT NO CUT, NO RING

**CHEROKEE GROUP**  
5,199' MD/TVD 5,052'

LS: PRED LT TAN- MED TAN, LT GY, WHT, BLKY, MOD FRM- FRM, FN- V FN XLN, DNSE, OCC PP VUG POR, SH: DRK GY, BLK CARB, SFT-MOD FRM, PLTY, BLKY, SMTH TXT, SS: WHT, LT GRY VF-F GRN, W/SRT, SUB-ANG, MOD HD, SME CALC CMT, NO CUT, NO RING

SURVEY: 5,235' MD 5,076' TVD  
INC. 49.1 / AZ. 176.8

LS: PRED LT TAN- MED TAN, LT GY, WHT, BLKY, MOD FRM- FRM, FN- V FN XLN, DNSE, OCC PP VUG POR, SH: DRK GY, BLK CARB, SFT-MOD FRM, SMTH TXT, SS: WHT, LT GRY VF-F GRN, W/SRT, SUB-ANG, MOD HD, SME CALC CMT, NO CUT, NO RING

SURVEY: 5,265' MD 5,096' TVD  
INC. 49.0 / AZ. 176.6

LS: PRED LT TAN- MED TAN, LT GY, WHT, BLKY, MOD FRM- FRM, FN- V FN XLN, DNSE, OCC PP VUG POR, SH: DRK GY, BLK CARB, SFT-MOD FRM, SMTH TXT, SS: WHT, LT GRY VF-F GRN, W/SRT, SUB-ANG, MOD HD, SME CALC CMT, NO CUT, NO RING

SURVEY: 5,295' MD 5,115' TVD  
INC. 49.2 / AZ. 176.5

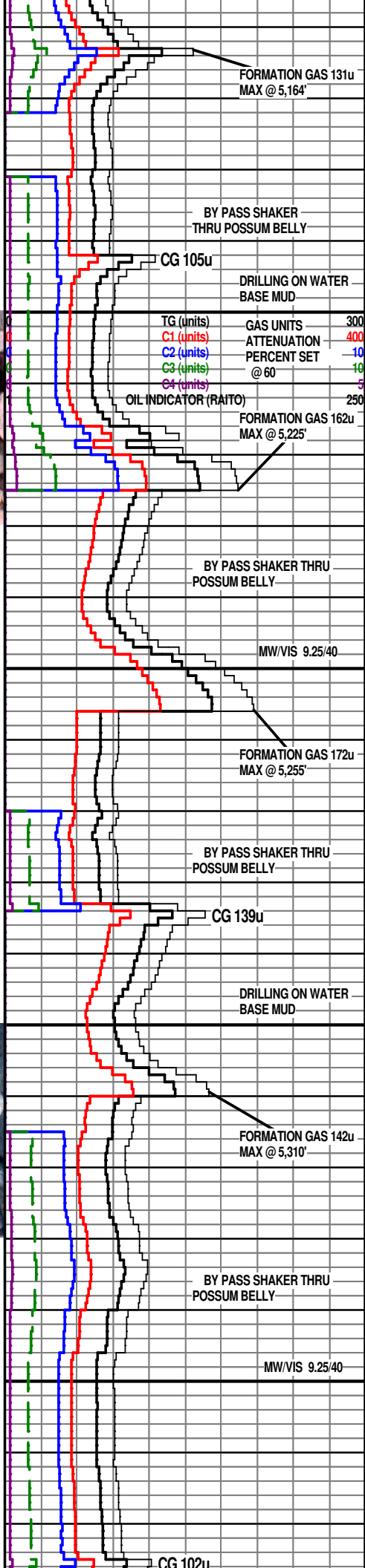
LS: PRED LT TAN- MED TAN, LT GY, WHT, BLKY, MOD FRM- FRM, FN- V FN XLN, DNSE, OCC PP VUG POR, SH: DRK GY, BLK CARB, SFT-MOD FRM, SMTH TXT, SS: WHT, LT GRY VF-F GRN, W/SRT, SUB-ANG, MOD HD, SME CALC CMT, NO CUT, NO RING, ABTD LCM

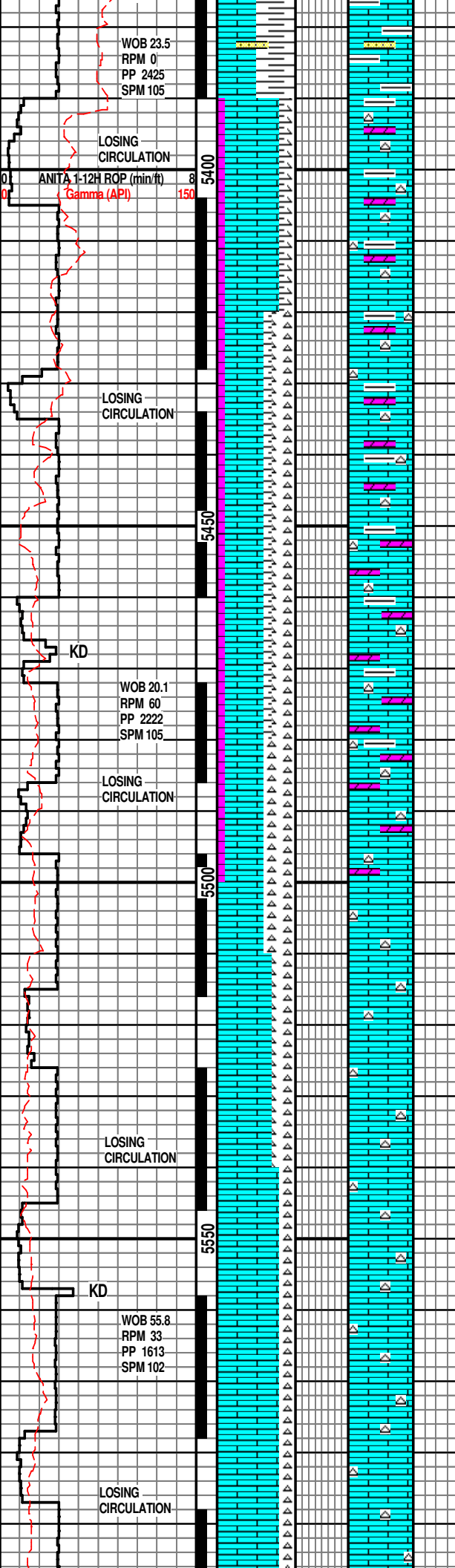
SURVEY: 5,326' MD 5,135' TVD  
INC. 51.6 / AZ. 177.9

LS: PRED LT TAN- MED TAN, LT GY, WHT, BLKY, MOD FRM- FRM, FN- V FN XLN, DNSE, OCC PP VUG POR, SH: DRK GY, BLK CARB, SFT-MOD FRM, SMTH TXT, SS: WHT, LT GRY VF-F GRN, W/SRT, SUB-ANG, MOD HD, SME CALC CMT, NO CUT, NO RING, ABTD LCM

SURVEY: 5,356' MD 5,153' TVD  
INC. 54.8 / AZ. 179.7

**MISSISSIPPI UNCONFORMITY**





**5,366' MD/TVD 5,159'**

SURVEY: 5,387' MD 5,170' TVD  
INC. 57.8 / AZ. 180.4

LS: PRED LT TAN- MED TAN, OCC MTTLD  
LT TAN- LT GY, MSTLY BLKY, TR PLTY,  
MOD FRM- FRM, OCC CHLKY, PRED FN-  
V FN XLN, SLI TR DNSE, SCAT HL FRAC  
POR, OCC PP VUG POR, SH: DRK GY,  
BLK CARB, SFT-MOD FRM, PLTY, BLKY,  
SMTH TXT, CHT: WHT TO MILKY-WHITE  
TRNSL, V- HRD, MICROXLN, BLKY, ANG,  
NO CUT, NO RING, ABDT LCM



**MISSISSIPPI LIME  
5,436' MD/TVD 5,194'**

SURVEY: 5,447' MD 5,200' TVD  
INC. 64.1 / AZ. 181.9

LS: OFF WH TO GY, SME TAN,  
MICR-OXLN, MOD-V/HD TO BRTL,  
BLKY, SH: DRK GY, BLK CARB,  
SFT-MOD FRM, SMTH TXT, DOL: OFF  
WHT, LT GY, VF-FXLN, V-HD, DNS, CHTY,  
SL/TRS-SH: GRY TO BLK, CHT: WHT TO  
MILKY-WHITE TRNSL, V- HRD,  
MICROXLN, ABDT LCM



SURVEY: 5,478' MD 5,212' TVD  
INC. 66.9 / AZ. 181.6

LS: OFF WH TO GY, SME TAN,  
MICRO-XLN, MOD-HD TO BRTL,  
BLKY, DOL: OFF WHT, LT GY, VF-FXLN,  
V-HD, DNS, CHTY, CHT: WHT TO  
MILKY-WHITE TRNSL, V- HRD,  
MICROXLN, ABDT LCM

SURVEY: 5,508' MD 5,224' TVD  
INC. 69.7 / AZ. 181.0

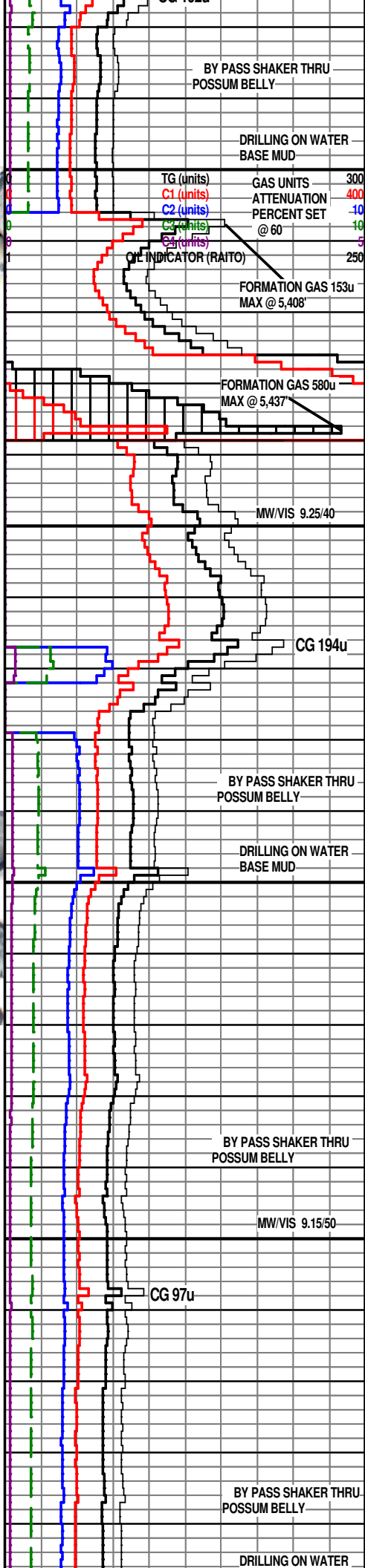
LS: OFF WH TO GY, SME TAN,  
MICRO-XLN, MOD-V/HD TO BRTL,  
BLKY, CHT: WHT TO MILKY-WHITE  
TRNSL, V- HRD, MICROXLN, NO CUT, NO  
RING, ABDT LCM

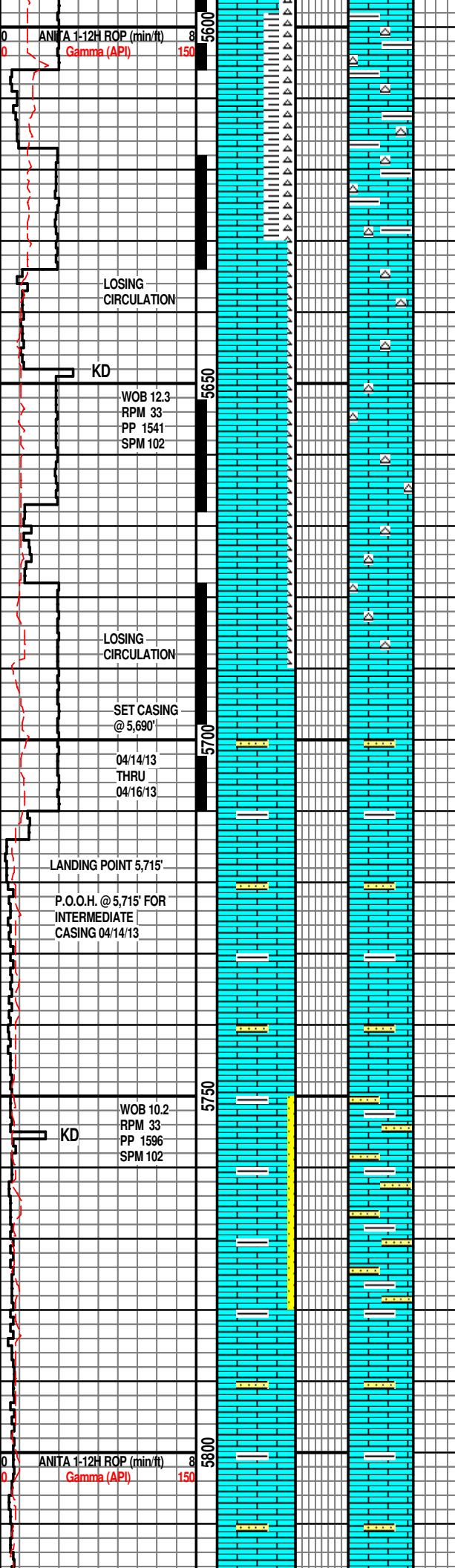
SURVEY: 5,538' MD 5,233' TVD  
INC. 72.9 / AZ. 180.5

LS: OFF WH TO GY, SME TAN,  
MICRO-XLN, MOD-V/HD TO BRTL,  
BLKY, CHT: WHT TO MILKY-WHITE  
TRNSL, V- HRD, MICROXLN, NO CUT, NO  
RING, ABDT LCM

SURVEY: 5,569' MD 5,241' TVD  
INC. 75.8 / AZ. 180.0

LS: OFF WH TO GY, SME TAN,  
MICRO-XLN, MOD-V/HD TO BRTL,  
BLKY, CHT: WHT TO MILKY-WHITE  
TRNSL, V- HRD, MICROXLN, NO CUT, NO  
RING, ABDT LCM





SURVEY: 5,599' MD 5,248' TVD  
INC. 78.3 / AZ. 179.8

LS: OFF WH TO GY, SME TAN, MICRO-XLN, MOD-V/HD TO BRTL, BLKY, SH: DRK GY, BLK CARB, SFT-MOD FRM, SMTH TXT, POSS UPPER HOLE DEBRE, CHT: WHT TO MILKY-WHITE TRNSL, V- HRD, MICROXLN, NO CUT, NO RING, ABDT LCM

SURVEY: 5,630' MD 5,254' TVD  
INC. 80.9 / AZ. 180.3

LS: OFF WH TO GY, SME TAN, SME SNDY, MICRO-XLN, MOD-V/HD TO BRTL, BLKY, CHT: WHT TO MILKY-WHITE TRNSL, V- HRD, MICROXLN, NO CUT, NO RING, ABDT LCM

SURVEY: 5,665' MD 5,259' TVD  
INC. 84.2 / AZ. 180.8

LS: OFF WH TO GY, SME TAN, SME SNDY, MICRO-XLN, MOD-V/HD TO BRTL, BLKY, TRS SS: MED/LT BRN, SME TAN, CONSOL, MED-CRSE GRN, WL-SRT, POORLY CMT, HD GRNS, SME EMBD SHALE, TRS SH: MOSTLY BLK, SME GRY, SL/TRS RED, BLKY, MICA, MOD FRM, RGH TXT, NO CUT, NO RING

SURVEY: 5,715' MD 5,261' TVD  
INC. 89.5 / AZ. 180.8

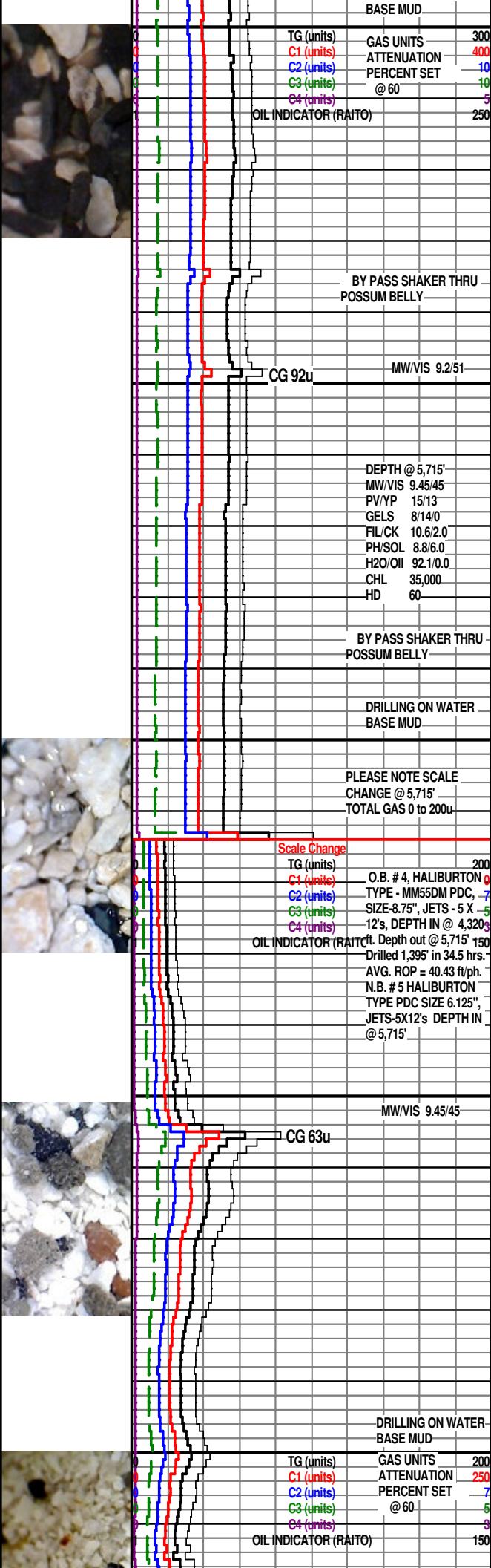
LS: OFF WH TO GY, SME TAN, SME SNDY, MICRO-XLN, MOD-V/HD TO BRTL, BLKY, SS: MED/LT BRN, SME TAN, CONSOL, MED-CRSE GRN, WL-SRT, POORLY CMT, HD GRNS, SME EMBD SHALE, TRS SH: MOSTLY BLK, SME GRY, SL/TRS RED, BLKY, MICA, MOD FRM, RGH TXT, POSS FRAC, NO CUT, NO RING

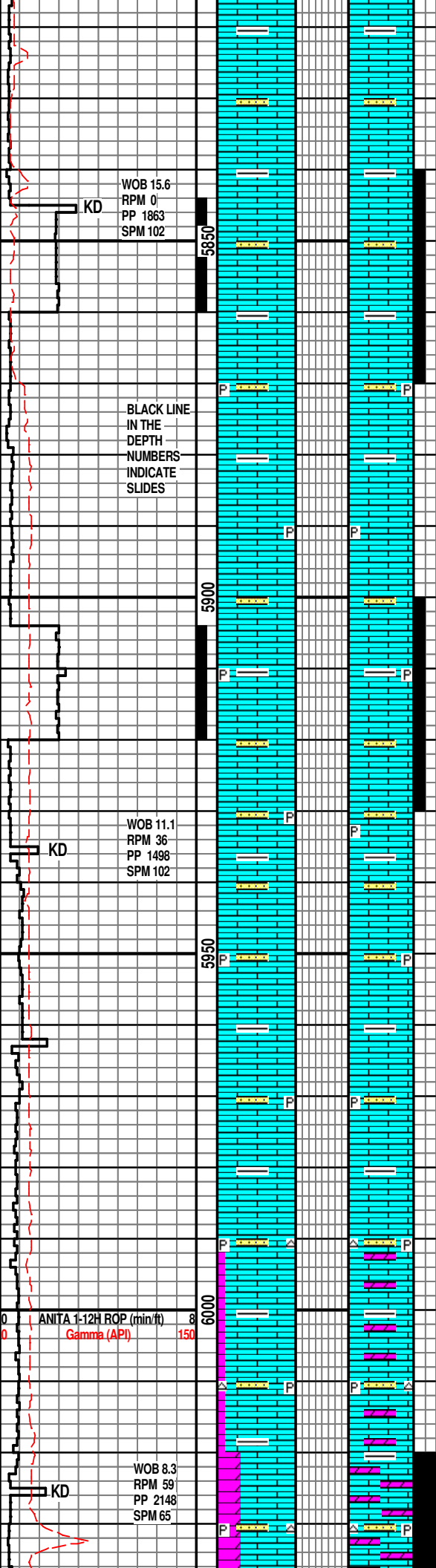
SURVEY: 5,768' MD 5,264' TVD  
INC. 90.1 / AZ. 180.8

LS: OFF WH TO GY, SME TAN, SME SNDY, MICRO-XLN, MOD-V/HD TO BRTL, BLKY, TRS SS: MED/LT BRN, SME TAN, CONSOL, MED-CRSE GRN, WL-SRT, POORLY CMT, HD GRNS, SME EMBD SHALE, TRS SH: MOSTLY BLK, SME GRY, SL/TRS RED, BLKY, MICA, MOD FRM, RGH TXT, POSS FRAC, NO CUT, NO RING

SURVEY: 5,799' MD 5,263' TVD  
INC. 91.2 / AZ. 180.6

LS: OFF WH TO GY, SME TAN, SME SNDY, MICRO-XLN, MOD-V/HD TO BRTL,





TRS SS: MED/LT BRN, SME TAN, CONSOL, MED-CRSE GRN, WL-SRT, POORLY CMT, HD, SME EMBD SHALE, V/SL TRS SH: MOSTLY BLK, SME GRY, SL/TRS RED, V/WEAK CUT, V/FAINT RING

SURVEY: 5,830' MD 5,262' TVD  
INC. 92.2 / AZ. 179.9

LS: OFF WH TO GY, SME TAN, SME SNDY, MICRO-XLN, MOD-V/HD TO BRTL, BLKY, V/SL TRS SS: MED/LT BRN, SME TAN, CONSOL, MED-CRSE GRN, WL-SRT, POORLY CMT, HD GRNS, SME EMBD SHALE, V/SL TRS SH: MOSTLY BLK, SME GRY, SL/TRS RED, BLKY, MICA, MOD FRM, RGH TXT, NO CUT, NO RING

SURVEY: 5,860' MD 5,262' TVD  
INC. 90.5 / AZ. 179.9

LS: OFF WH TO GY, SME TAN, SME SNDY, MICRO-XLN, MOD-V/HD TO BRTL, BLKY, TRS SS: MED/LT BRN, SME TAN, CONSOL, MED-CRSE GRN, WL-SRT, POORLY CMT, HD GRNS, SME EMBD SHALE, V/SL TRS SH: MOSTLY BLK, SME GRY, SL/TRS RED, BLKY, MICA, MOD FRM, RGH TXT, TRS PYR, V/WEAK CUT, V/FAINT RING

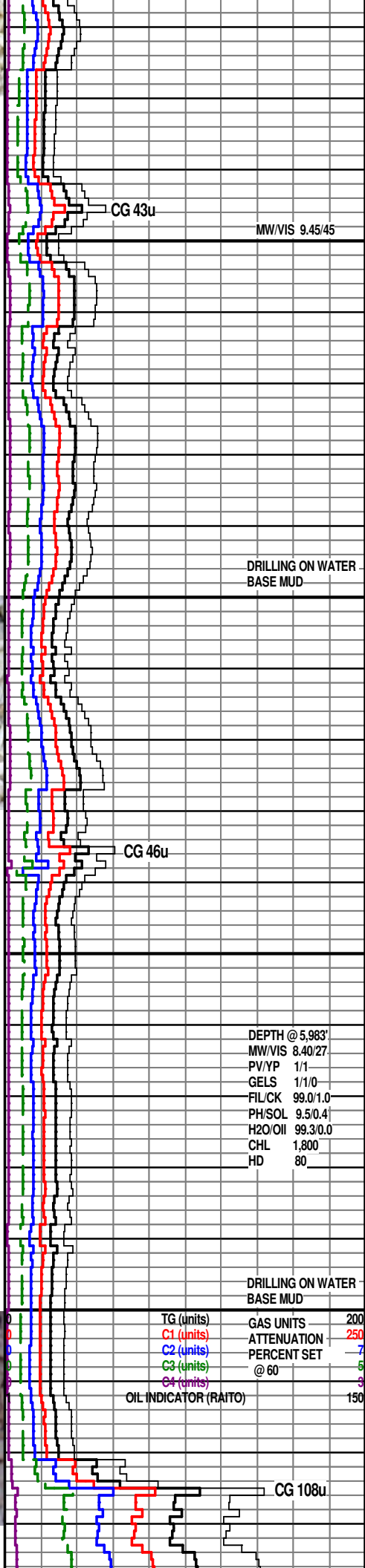
SURVEY: 5,912' MD 5,261' TVD  
INC. 89.6 / AZ. 179.4

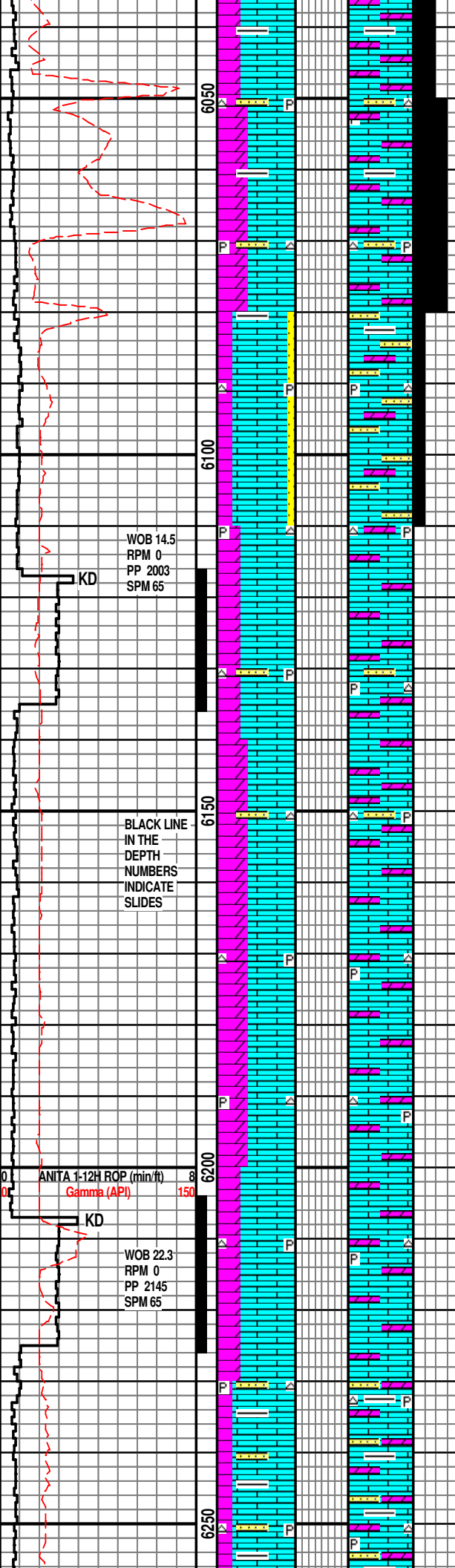
LS: OFF WH TO GY, SME TAN, SME SNDY, MICRO-XLN, MOD-V/HD TO BRTL, BLKY, TRS SS: MED/LT BRN, SME TAN, CONSOL, MED-CRSE GRN, WL-SRT, POORLY CMT, HD GRNS, SME EMBD SHALE, TRS PYR, V/SL TRS SH: MOSTLY BLK, SME GRY, SL/TRS RED, BLKY, MICA, MOD FRM, RGH TXT, V/WEAK CUT, V/FAINT RING

SURVEY: 5,973' MD 5,262' TVD  
INC. 88.8 / AZ. 178.2

LS: OFF WHT, TAN, MICRO/XLN, SNDY, BLKY-S/BLKY, FRM, DOL: LT-MED TAN, MICRO/SUC, SME MICRO-XLN, OIL STN/SAT, S/BLKY, SNDY TXT, SL/TRS SS: MED/LT BRN, SME TAN, CONSOL, MED-CRSE GRN, WL-SRT, POORLY CMT, HD GRNS, SME EMBD SHALE, SL/TRS MOSTLY BLK, SME GRY, SL/TRS RED, BLKY, MICA, MOD FRM, RGH TXT, TRS PYR, CHRT: OFF WHT, CLR, NO CUT, NO RING

LS: OFF WHT, TAN, MICRO/XLN, SNDY, BLKY-S/BLKY, FRM, DOL: LT-MED TAN, MICRO/SUC, SME MICRO-XLN, OIL STN/SAT, S/BLKY, SNDY TXT, SL/TRS SS:





STNSAT, S/BLKY, SANDY TXT, SL/TRS SS: MED/LT BRN, SME TAN, CONSOL, MED-CRSE GRN, WL-SRT, POORLY CMT, HD GRNS, SME EMBD SHALE, SL/TRS MOSTLY BLK, SME GRY, SL/TRS RED, BLKY, MICA, MOD FRM, RGH TXT, TRS PYR, CHRT: OFF WHT, CLR, FAIR-GOOD CUT, GOOD BLU/GNSH RING

SURVEY: 6,065' MD 5,264' TVD  
INC. 89.6 / AZ. 178.0

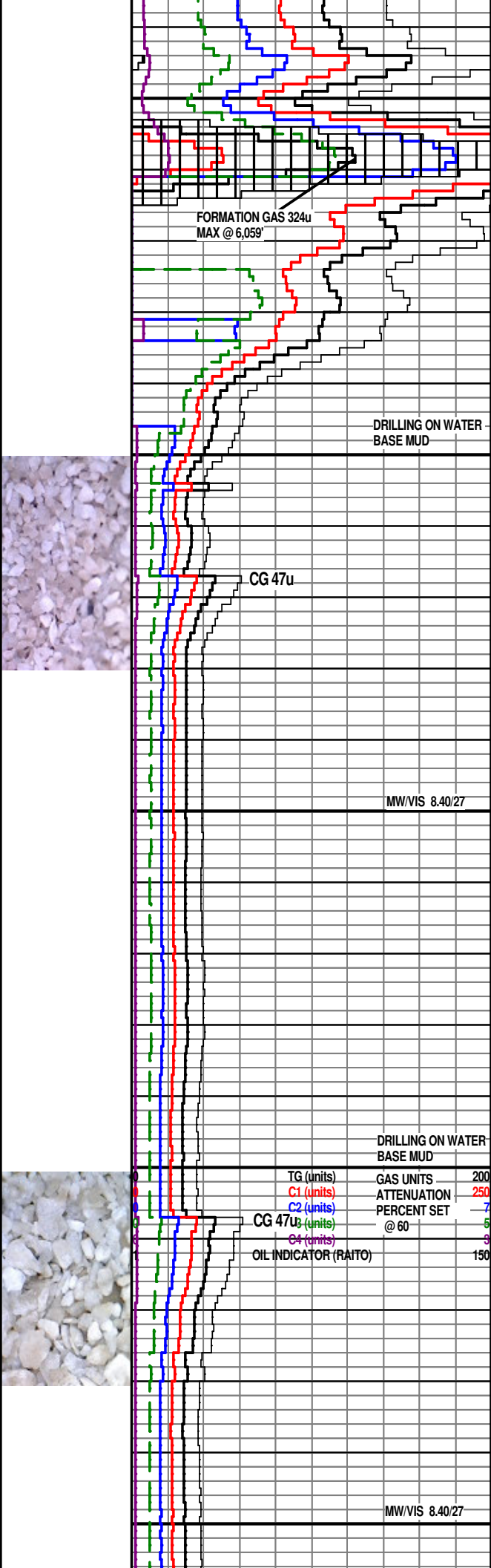
LS: OFF WHT, TAN, MICRO/XLN, SNDY, BLKY-S/BLKY, FRM, DOL: LT-MED TAN, MICRO/SUC, SME MICRO-XLN, OIL STNSAT, S/BLKY, SNDY TXT, SL/TRS SS: MED/LT BRN, SME TAN, CONSOL, MED-CRSE GRN, WL-SRT, POORLY CMT, HD GRNS, SME EMBD SHALE, SH: SL/TRS MOSTLY BLK, SME GRY, SL/TRS RED, BLKY, MICA, MOD FRM, RGH TXT, TRS PYR, CHRT: OFF WHT, CLR, WEAK CUT, FAINT BLU/GNSH RING

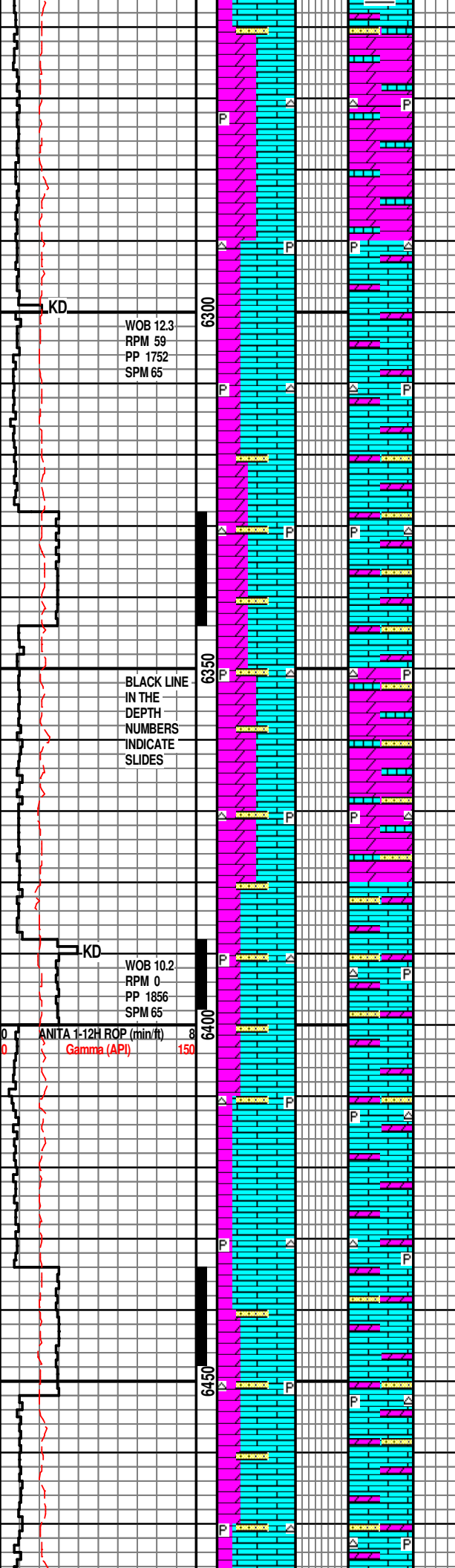
LS: OFF WHT TO WHT, SME STN, MICRO-XLN, MOD-V/HD TO BRTL, BLKY, V/SL TRS SS: MED/LT BRN, SME TAN, CONSOL, MED-CRSE GRN, WL-SRT, POORLY CMT, HD GRNS, SME EMBD SHALE, DOL: LT-MED TAN, SME MICRO-XLN, S/BLKY, SNDY TXT, TRS PYR, TRS CHRT: OFF WHT, CLR, NO CUT, NO RING

LS: OFF WHT TO WHT, SME STN, MICRO-XLN, MOD-V/HD TO BRTL, BLKY, DOL: LT-MED TAN, SME STN, MICRO-XLN, S/BLKY, SNDY TXT, TRS PYR, TRS CHRT: OFF WHT, CLR, NO CUT, NO RING

LS: OFF WHT TO WHT, SME STN, MICRO-XLN, MOD-V/HD TO BRTL, BLKY, SH: SL/TRS MOSTLY BLK, SME GRY, SL/TRS RED, BLKY, MICA, MOD FRM, RGH TXT, V/SL TRS SS: MED/LT BRN, SME TAN, CONSOL, MED-CRSE GRN, WL-SRT, POORLY CMT, HD GRNS, SME EMBD SHALE, DOL: LT-MED TAN, MICRO-XLN, S/BLKY, SNDY TXT, TRS PYR, TRS CHRT: OFF WHT, CLR, NO CUT, NO RING

SURVEY: 6,247' MD 5,262' TVD  
INC. 90.2 / AZ. 179.3





LS: OFF WHT TO WHT , SME STN,  
 MICRO-XLN, MOD-V/HD TO BRTL, BLKY,  
 SH: SL/TRS MOSTLY BLK, SME GRY,  
 SL/TRS RED, BLKY, MICA, MOD FRM,  
 RGH TXT, V/SL TRS SS: MED/LT BRN,  
 SME TAN, CONSOL, MED-CRSE GRN,  
 WL-SRT, POORLY CMT, HD GRNS, SME  
 EMBD SHALE, DOL: LT-MED TAN,  
 MICRO-XLN, S/BLKY, SNDY TXT, TRS  
 PYR, TRS CHRT: OFF WHT, CLR, NO  
 CUT, NO RING

LS: OFF WHT TO WHT , SME STN,  
 MICRO-XLN, MOD-V/HD TO BRTL, BLKY,  
 V/SL TRS SS: MED/LT BRN, SME TAN,  
 CONSOL, MED-CRSE GRN, WL-SRT,  
 POORLY CMT, HD GRNS, SME EMBD  
 SHALE, DOL: LT-MED TAN, MICRO-XLN,  
 S/BLKY, SNDY TXT, TRS PYR, TRS CHRT:  
 OFF WHT, CLR, NO CUT, NO RING

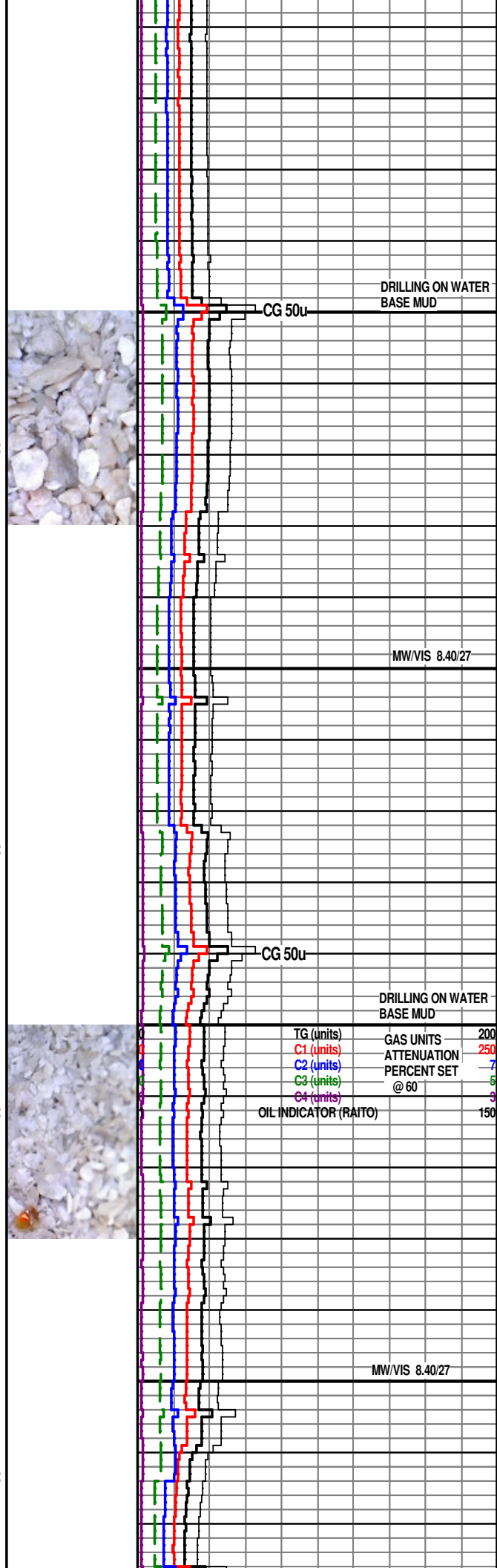
SURVEY: 6,337' MD 5,261' TVD  
 INC. 90.6 / AZ. 179.6

LS: OFF WHT TO WHT , SME STN,  
 MICRO-XLN, MOD-V/HD TO BRTL, BLKY,  
 V/SL TRS SS: MED/LT BRN, SME TAN,  
 CONSOL, MED-CRSE GRN, WL-SRT,  
 POORLY CMT, HD GRNS, SME EMBD  
 SHALE, DOL: LT-MED TAN, MICRO-XLN,  
 S/BLKY, SNDY TXT, TRS PYR, TRS CHRT:  
 OFF WHT, CLR, NO CUT, NO RING

LS: OFF WHT TO WHT , SME STN,  
 MICRO-XLN, MOD-V/HD TO BRTL, BLKY,  
 V/SL TRS SS: MED/LT BRN, SME TAN,  
 CONSOL, MED-CRSE GRN, WL-SRT,  
 POORLY CMT, HD GRNS, SME EMBD  
 SHALE, DOL: LT-MED TAN, MICRO-XLN,  
 S/BLKY, SNDY TXT, TRS PYR, TRS CHRT:  
 OFF WHT, CLR, NO CUT, NO RING

SURVEY: 6,428' MD 5,261' TVD  
 INC. 90.3 / AZ. 178.5

LS: OFF WHT TO WHT , SME STN,  
 MICRO-XLN, MOD-V/HD TO BRTL, BLKY,  
 V/SL TRS SS: MED/LT BRN, SME TAN,  
 CONSOL, MED-CRSE GRN, WL-SRT,  
 POORLY CMT, HD GRNS, SME EMBD  
 SHALE, DOL: LT-MED TAN, MICRO-XLN,  
 S/BLKY, SNDY TXT, TRS PYR, TRS CHRT:  
 OFF WHT, CLR, NO CUT, NO RING



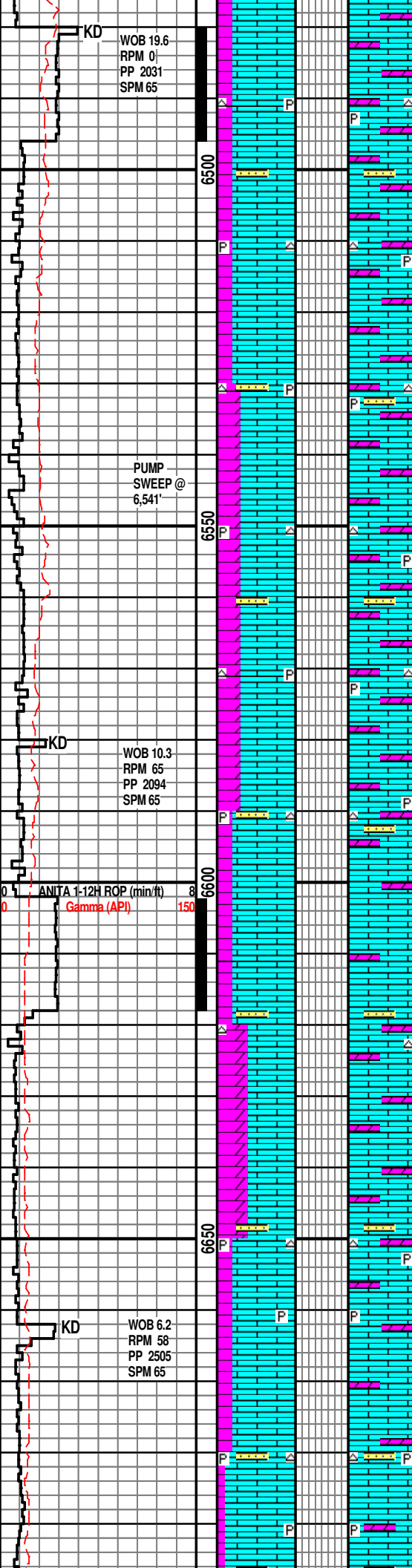
DRILLING ON WATER  
 BASE MUD

MW/VIS 8.40/27

DRILLING ON WATER  
 BASE MUD

TG (units)	GAS UNITS	200
C1 (units)	ATTENUATION	250
C2 (units)	PERCENT SET	7
C3 (units)	@ 60	5
C4 (units)		3
OIL INDICATOR (RAITO)		150

MW/VIS 8.40/27



LS: OFF WHT TO WHT , SME STN, MICRO-XLN, MOD-V/HD TO BRTL, BLKY, V/SL TRS SS: MED/LT BRN, SME TAN, CONSOL, MED-CRSE GRN, WL-SRT, POORLY CMT, HD GRNS, SME EMBD SHALE, DOL: LT-MED TAN, MICRO-XLN, S/BLKY, SNDY TXT, TRS PYR, TRS CHRT: OFF WHT, CLR, NO CUT, NO RING

SURVEY: 6,520' MD 5,262' TVD  
INC. 88.5 / AZ. 178.7

LS: OFF WHT TO WHT , SME STN, MICRO-XLN, MOD-V/HD TO BRTL, BLKY, V/SL TRS SS: MED/LT BRN, SME TAN, CONSOL, MED-CRSE GRN, WL-SRT, POORLY CMT, HD GRNS, SME EMBD SHALE, DOL: LT-MED TAN, MICRO-XLN, S/BLKY, SNDY TXT, TRS PYR, TRS CHRT: OFF WHT, CLR, NO CUT, NO RING

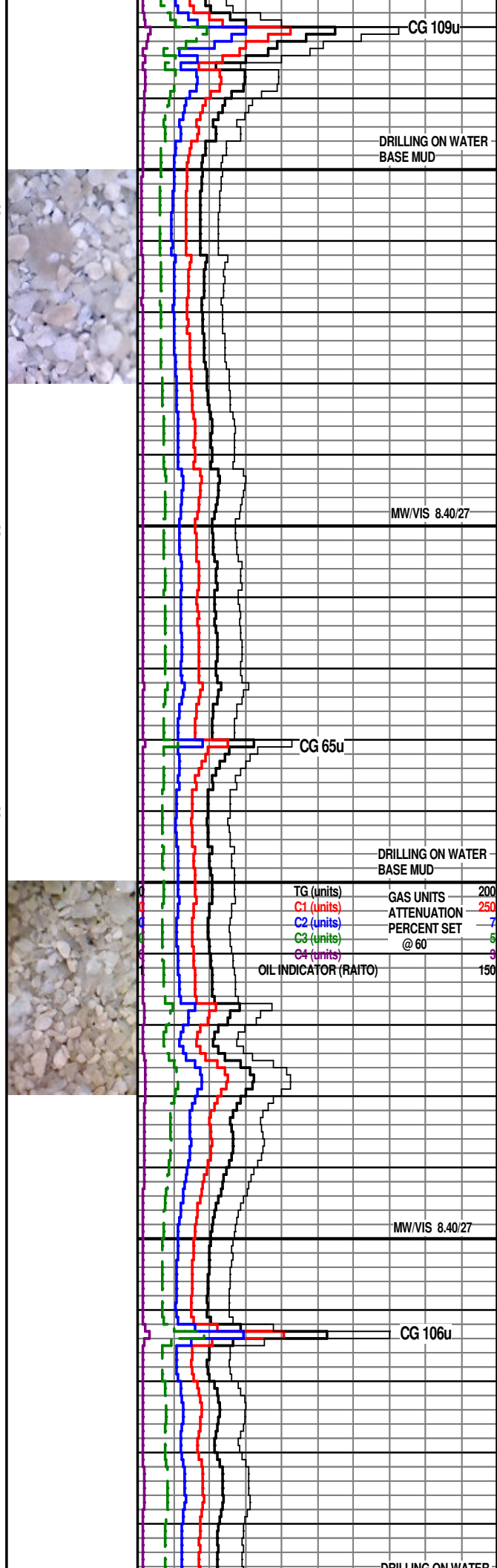
LS: OFF WHT TO WHT , SME STN, MICRO-XLN, MOD-V/HD TO BRTL, BLKY, V/SL TRS SS: MED/LT BRN, SME TAN, CONSOL, MED-CRSE GRN, WL-SRT, POORLY CMT, HD GRNS, SME EMBD SHALE, DOL: LT-MED TAN, MICRO-XLN, S/BLKY, SNDY TXT, TRS PYR, TRS CHRT: OFF WHT, CLR, NO CUT, NO RING

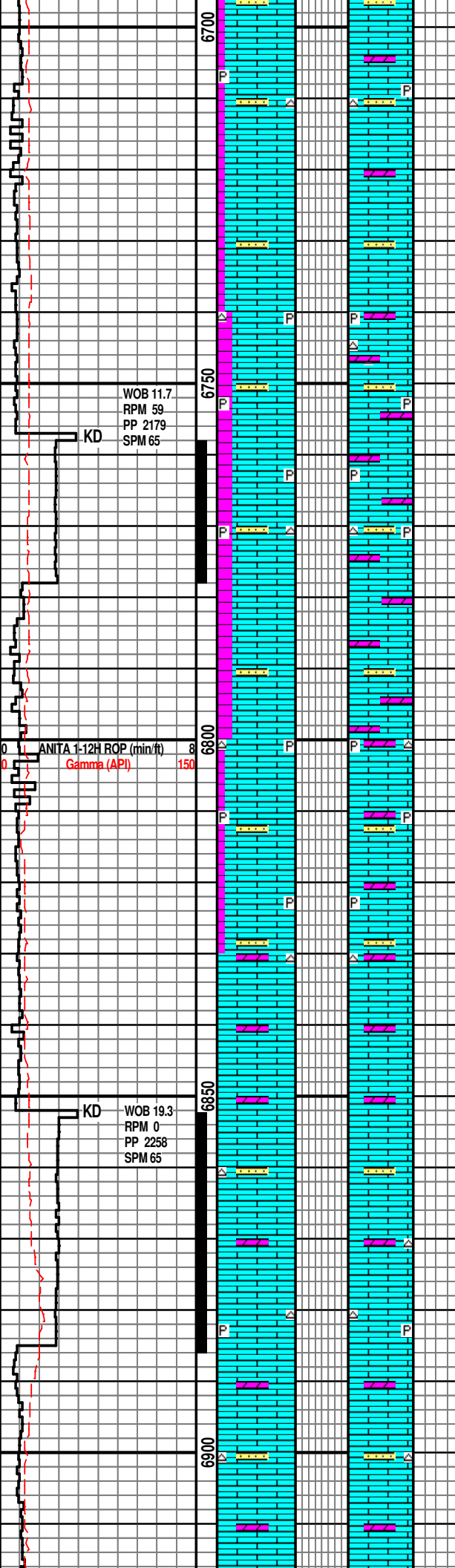
SURVEY: 6,611' MD 5,264' TVD  
INC. 88.8 / AZ. 179.4

LS: OFF WHT TO WHT , SME STN, MICRO-XLN, MOD-V/HD TO BRTL, BLKY, V/SL TRS SS: MED/LT BRN, SME TAN, CONSOL, MED-CRSE GRN, WL-SRT, POORLY CMT, HD GRNS, SME EMBD SHALE, DOL: LT-MED TAN, MICRO-XLN, S/BLKY, SNDY TXT, NO CUT, NO RING

LS: OFF WHT TO WHT , SME STN, MICRO-XLN, MOD-V/HD TO BRTL, BLKY, V/SL TRS SS: MED/LT BRN, SME TAN, CONSOL, MED-CRSE GRN, WL-SRT, POORLY CMT, HD GRNS, SME EMBD SHALE, DOL: LT-MED TAN, MICRO-XLN, S/BLKY, SNDY TXT, TRS PYR, NO CUT, NO RING

LS: OFF WHT TO WHT , SME STN, MICRO-XLN, MOD-V/HD TO BRTL, BLKY, V/SL TRS SS: MED/LT BRN, SME TAN, CONSOL, MED-CRSE GRN, WL-SRT, POORLY CMT, HD GRNS, SME EMBD SHALE, DOL: LT-MED TAN, MICRO-XLN, S/BLKY, SNDY TXT, TRS PYR, NO CUT, NO RING





SURVEY: 6,708' MD 5,264' TVD  
INC. 91.0 / AZ. 179.7

LS: OFF WHT TO WHT , SME STN,  
MICRO-XLN, MOD-V/HD TO BRTL, BLKY,  
V/SL TRS SS: MED/LT BRN, SME TAN,  
CONSOL, MED-CRSE GRN, WL-SRT,  
POORLY CMT, HD GRNS, SME EMBD  
SHALE, DOL: LT-MED TAN, MICRO-XLN,  
S/BLKY, SNDY TXT, NO CUT, NO RING

LS: OFF WHT TO WHT , SME STN,  
MICRO-XLN, MOD-V/HD TO BRTL, BLKY,  
V/SL TRS SS: MED/LT BRN, SME TAN,  
CONSOL, MED-CRSE GRN, WL-SRT,  
POORLY CMT, HD GRNS, SME EMBD  
SHALE, DOL: LT-MED TAN, MICRO-XLN,  
S/BLKY, SNDY TXT, TRS PYR, NO CUT,  
NO RING

LS: OFF WHT TO WHT , SME STN, LS:  
OFF WHT TO WHT , SME STN,  
MICRO-XLN, MOD-V/HD TO BRTL, BLKY,  
V/SL TRS SS: MED/LT BRN, SME TAN,  
CONSOL, MED-CRSE GRN, WL-SRT,  
POORLY CMT, HD GRNS, SME EMBD  
SHALE, DOL: LT-MED TAN, MICRO-XLN,  
S/BLKY, SL/SNDY TXT, TRS PYR, NO  
CUT, NO RING

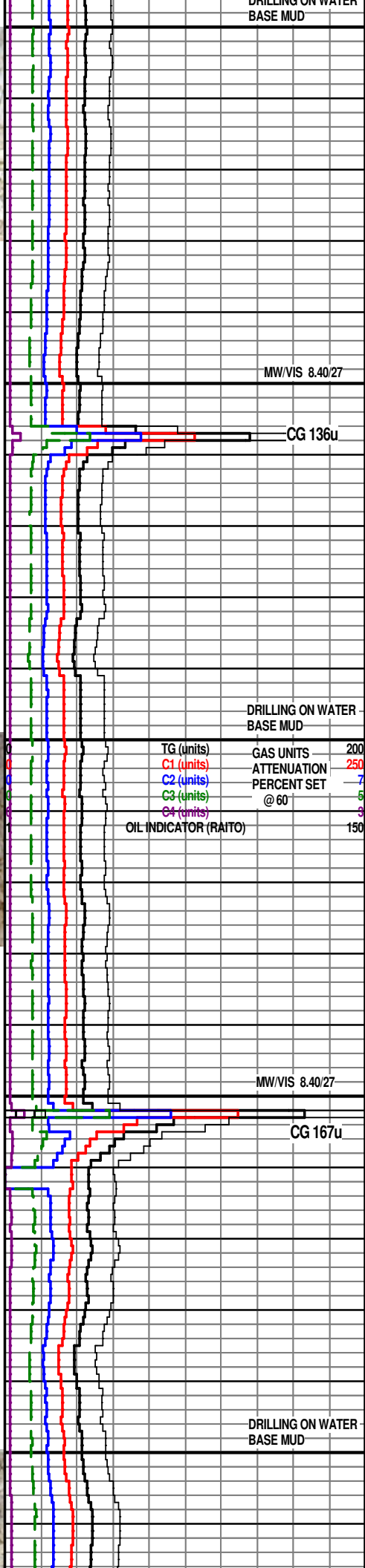
SURVEY: 6,802' MD 5,262' TVD  
INC. 91.3 / AZ. 180.4

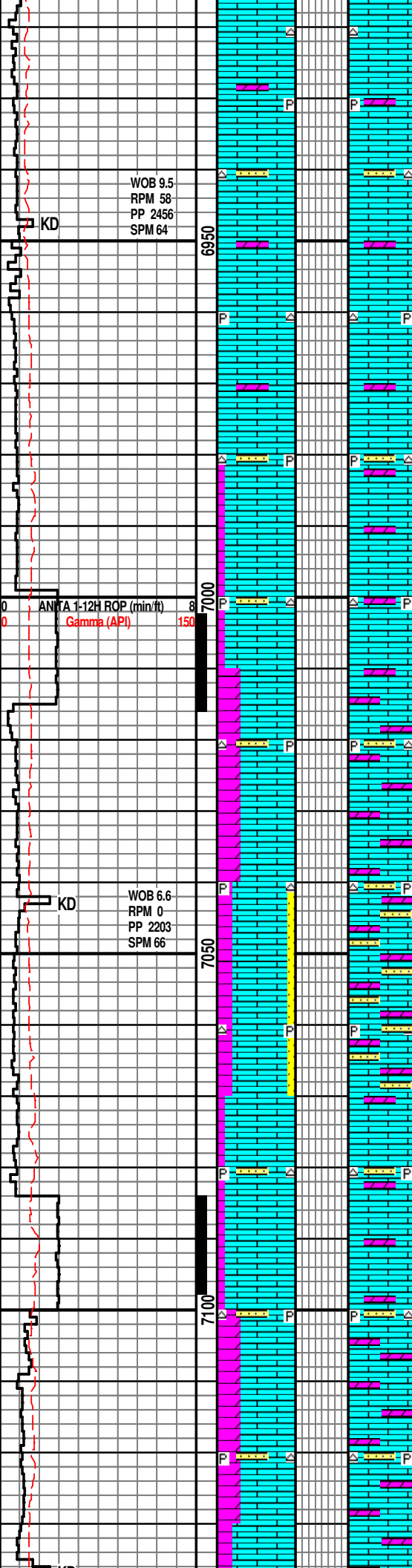
LS: OFF WHT TO WHT , SME STN,  
MICRO-XLN, MOD-V/HD TO BRTL, BLKY,  
OOL, V/SL TRS SS: MED/LT BRN, SME  
TAN, CONSOL, MED-CRSE GRN, WL-SRT,  
POORLY CMT, HD GRNS, SME EMBD  
SHALE, DOL: LT-MED TAN, MICRO-XLN,  
S/BLKY, SL/SNDY TXT, TRS PYR, NO  
CUT, NO RING

LS: OFF WHT TO WHT , SME STN,  
MICRO-XLN, OOL, MOD-V/HD TO BRTL,  
BLKY, V/SL TRS SS: MED/LT BRN, SME  
TAN, CONSOL, MED-CRSE GRN, WL-SRT,  
POORLY CMT, HD GRNS, SME EMBD  
SHALE, TRS DOL: LT-MED TAN,  
MICRO-XLN, S/BLKY, SL/SNDY TXT, TRS  
PYR, NO CUT, NO RING

SURVEY: 6,897' MD 5,262' TVD  
INC. 88.5 / AZ. 180.6

LS: OFF WHT TO WHT , SME STN,  
MICRO-XLN, MOD-V/HD TO BRTL, BLKY,  
V/SL TRS SS: MED/LT BRN, SME TAN,  
CONSOL, MED-CRSE GRN, WL-SRT,  
POORLY CMT, HD GRNS, SME EMBD  
SHALE, DOL: LT-MED TAN, MICRO-XLN,  
S/BLKY, SNDY TXT, NO CUT, NO RING





OOL, V/SL TRS SS: MED/LT BRN, SME TAN, CONSOL, MED-CRSE GRN, WL-SRT, POORLY CMT, HD GRNS, SME EMBD SHALE, TRS DOL: LT-MED TAN, MICRO-XLN, S/BLKY, SL/SNDY TXT, TRS PYR, NO CUT, NO RING

LS: OFF WHT TO WHT, SME STN, MICRO-XLN, MOD-V/HD TO BRTL, BLKY, OOL, V/SL TRS SS: MED/LT BRN, SME TAN, CONSOL, MED-CRSE GRN, WL-SRT, POORLY CMT, HD GRNS, SME EMBD SHALE, TRS DOL: LT-MED TAN, MICRO-XLN, S/BLKY, SL/SNDY TXT, TRS PYR, NO CUT, NO RING

SURVEY: 6,992' MD 5,263' TVD  
INC. 90.6 / AZ. 180.1

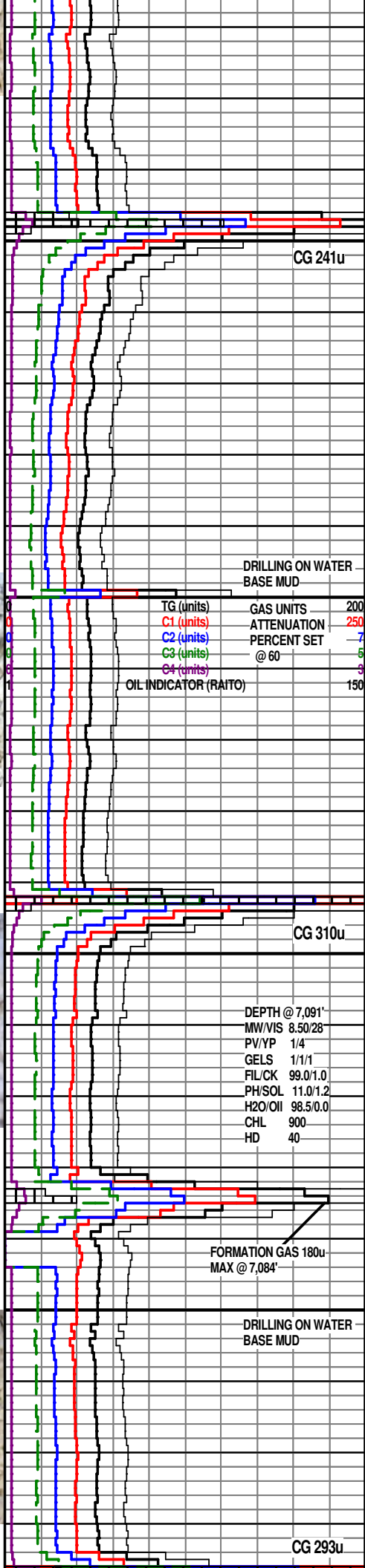
LS: OFF WHT TO WHT, SME STN, MICRO-XLN, MOD-V/HD TO BRTL, BLKY, OOL, V/SL TRS SS: MED/LT BRN, SME TAN, CONSOL, MED-CRSE GRN, WL-SRT, POORLY CMT, HD GRNS, SME EMBD SHALE, DOL: LT-MED TAN, MICRO-XLN, S/BLKY, SL/SNDY TXT, TRS PYR, NO CUT, NO RING

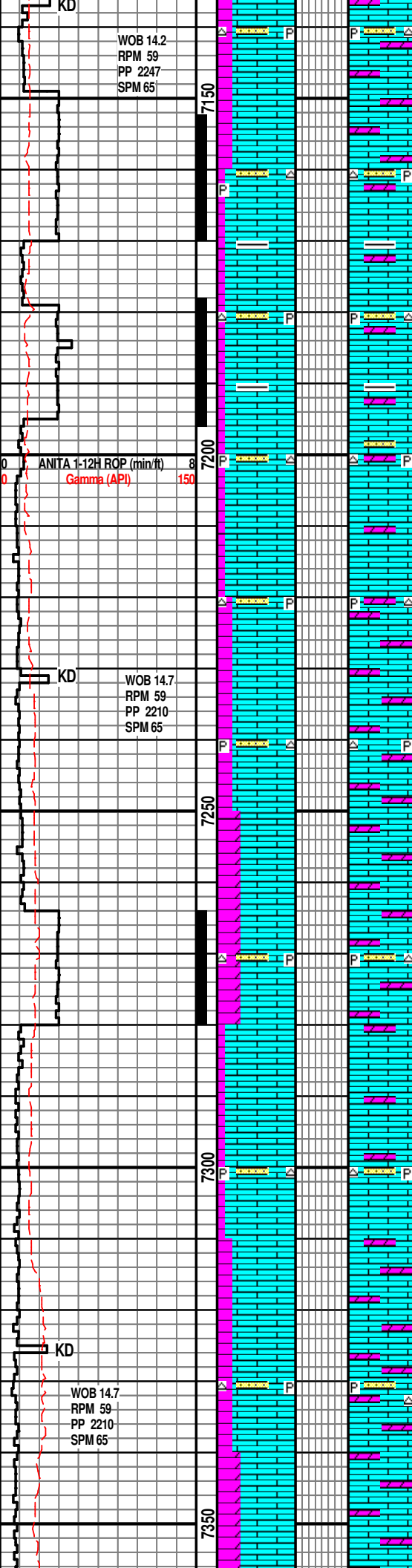
LS: OFF WHT TO WHT, SME STN, MICRO-XLN, MOD-V/HD TO BRTL, BLKY, OOL, SS: MED/LT BRN, SME TAN, CONSOL, MED-CRSE GRN, WL-SRT, POORLY CMT, HD GRNS, SME EMBD SHALE, DOL: LT-MED TAN, MICRO-XLN, S/BLKY, SL/SNDY TXT, TRS PYR, NO CUT, NO RING

SURVEY: 7,086' MD 5,262' TVD  
INC. 90.9 / AZ. 181.1

LS: OFF WHT TO WHT, SME STN, MICRO-XLN, OOL, MOD-V/HD TO BRTL, BLKY, V/SL TRS SS: MED/LT BRN, SME TAN, CONSOL, MED-CRSE GRN, WL-SRT, POORLY CMT, HD GRNS, SME EMBD SHALE, DOL: LT-MED TAN, MICRO-XLN, S/BLKY, SL/SNDY TXT, TRS PYR, NO CUT, NO RING

LS: OFF WHT TO WHT, SME STN, MICRO-XLN, MOD-V/HD TO BRTL, BLKY, OOL, V/SL TRS SS: MED/LT BRN, SME TAN, CONSOL, MED-CRSE GRN, WL-SRT, POORLY CMT, HD GRNS, SME EMBD SHALE, DOL: LT-MED TAN, MICRO-XLN, S/BLKY, SL/SNDY TXT, TRS PYR, NO CUT, NO RING





S/BLKY, SL/SNDY TXT, TRS PYR, NO CUT, NO RING

LS: OFF WHT TO WHT , SME STN, MICRO-XLN, MOD-V/HD TO BRTL, BLKY, OOL, V/SL TRS SS: MED/LT BRN, SME TAN, CONSOL, MED-CRSE GRN, WL-SRT, POORLY CMT, HD GRNS, SME EMBD SHALE, SH: SL/TRS MOSTLY BLK, SME GRY, SL/TRS RED, BLKY, MICA, MOD FRM, RGH TXT, DOL: LT-MED TAN, MICRO-XLN, S/BLKY, SL/SNDY TXT, TRS PYR, NO CUT, NO RING

SURVEY: 7,181' MD 5,262' TVD  
INC. 88.4 / AZ. 181.9

LS: OFF WHT TO WHT , SME STN, MICRO-XLN, OOL, MOD-V/HD TO BRTL, BLKY, V/SL TRS SS: MED/LT BRN, SME TAN, CONSOL, MED-CRSE GRN, WL-SRT, POORLY CMT, HD GRNS, SME EMBD SHALE, DOL: LT-MED TAN, MICRO-XLN, S/BLKY, SL/SNDY TXT, TRS PYR, NO CUT, NO RING

LS: OFF WHT TO WHT , SME STN, MICRO-XLN, OOL, MOD-V/HD TO BRTL, BLKY, V/SL TRS SS: MED/LT BRN, SME TAN, CONSOL, MED-CRSE GRN, WL-SRT, POORLY CMT, HD GRNS, SME EMBD SHALE, DOL: LT-MED TAN, MICRO-XLN, S/BLKY, SL/SNDY TXT, TRS PYR, NO CUT, NO RING

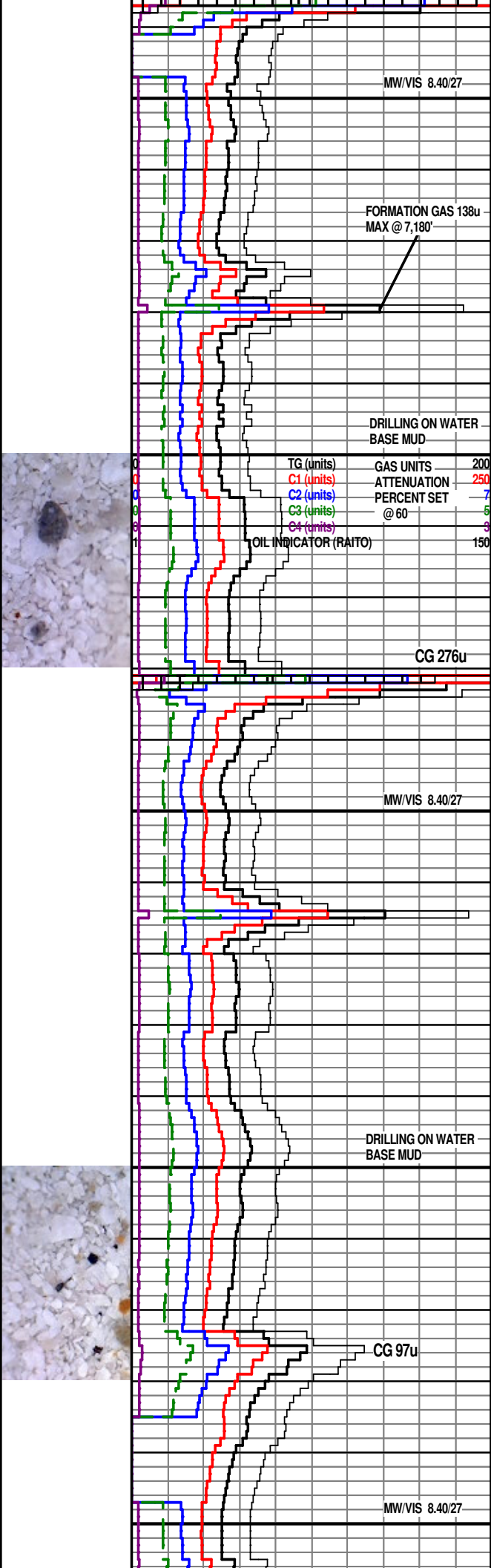
LS: OFF WHT TO WHT , SME STN, MICRO-XLN, OOL, MOD-V/HD TO BRTL, BLKY, V/SL TRS SS: MED/LT BRN, SME TAN, CONSOL, MED-CRSE GRN, WL-SRT, POORLY CMT, HD GRNS, SME EMBD SHALE, DOL: LT-MED TAN, MICRO-XLN, S/BLKY, SL/SNDY TXT, TRS PYR, NO CUT, NO RING

SURVEY: 7,275' MD 5,266' TVD  
INC. 87.0 / AZ. 181.5

LS: OFF WHT TO WHT , SME STN, MICRO-XLN, OOL, MOD-V/HD TO BRTL, BLKY, V/SL TRS SS: MED/LT BRN, SME TAN, CONSOL, MED-CRSE GRN, WL-SRT, POORLY CMT, HD GRNS, SME EMBD SHALE, DOL: LT-MED TAN, MICRO-XLN, S/BLKY, SL/SNDY TXT, TRS PYR, NO CUT, NO RING

LS: OFF WHT TO WHT , SME STN, MICRO-XLN, OOL, MOD-V/HD TO BRTL, BLKY, V/SL TRS SS: MED/LT BRN, SME TAN, CONSOL, MED-CRSE GRN, WL-SRT, POORLY CMT, HD GRNS, SME EMBD SHALE, DOL: LT-MED TAN, MICRO-XLN, S/BLKY, SL/SNDY TXT, TRS PYR, NO CUT, NO RING

LS: OFF WHT TO WHT , SME STN, MICRO-XLN, OOL, MOD-V/HD TO BRTL, BLKY, V/SL TRS SS: MED/LT BRN, SME TAN, CONSOL, MED-CRSE GRN, WL-SRT, POORLY CMT, HD GRNS, SME EMBD SHALE, DOL: LT-MED TAN, MICRO-XLN,



S/BLKY, SL/SNDY TXT, TRS PYR, NO CUT, NO RING

SURVEY: 7,370' MD 5,271' TVD  
INC. 86.3 / AZ. 180.8

LS: OFF WHT TO WHT, SME STN, MICRO-XLN, OOL, MOD-V/HD TO BRTL, BLKY, V/SL TRS SS: MED/LT BRN, SME TAN, CONSOL, MED-CRSE GRN, WL-SRT, POORLY CMT, HD GRNS, SME EMBD SHALE, DOL: LT-MED TAN, MICRO-XLN, S/BLKY, SL/SNDY TXT, TRS PYR, WK CUT, THIN BLU-GREEN RING

LS: OFF WHT-WHT, OOL, MICRO/XLN, BLKY-S/BLKY, FRM, TRS CHRT: OFF WHT, CLR, HD, DOL: LT-MED BRN, MICRO/SUC, SNDY, S/BLKY, MOD FRM-HD, V/SL TRS SS: MED/LT BRN, SME TAN, CONSOL, MED-CRSE GRN, WL-SRT, POORLY CMT, HD GRNS, SME EMBD SHALE, TRS SH: SL/TRS MOSTLY BLK, SME GRY, SL/TRS RED, BLKY, MICA, MOD FRM, RGH TXT, SL/TRS PYR, WK-FR CUT, THIN BLU-GREEN RING

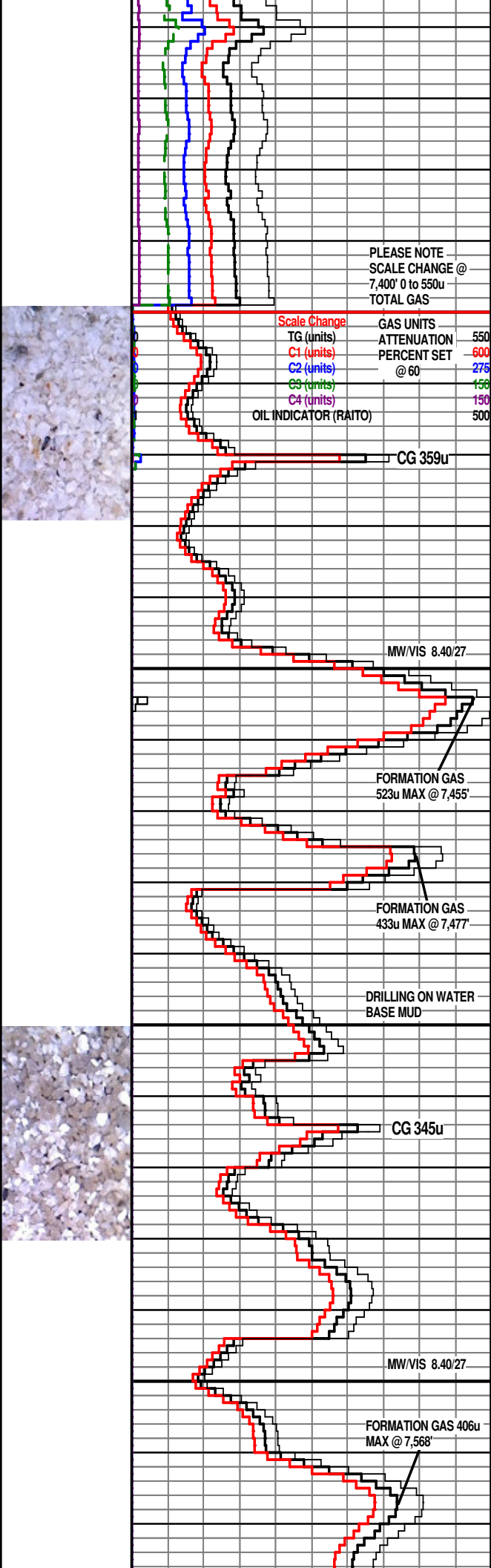
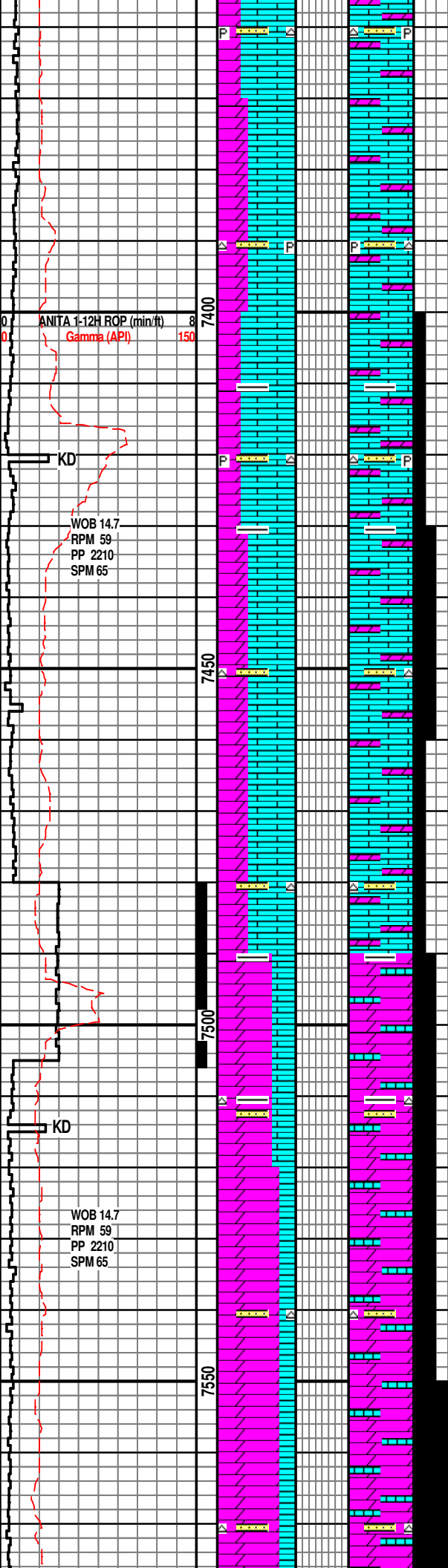
SURVEY: 7,464' MD 5,277' TVD  
INC. 86.5 / AZ. 179.9

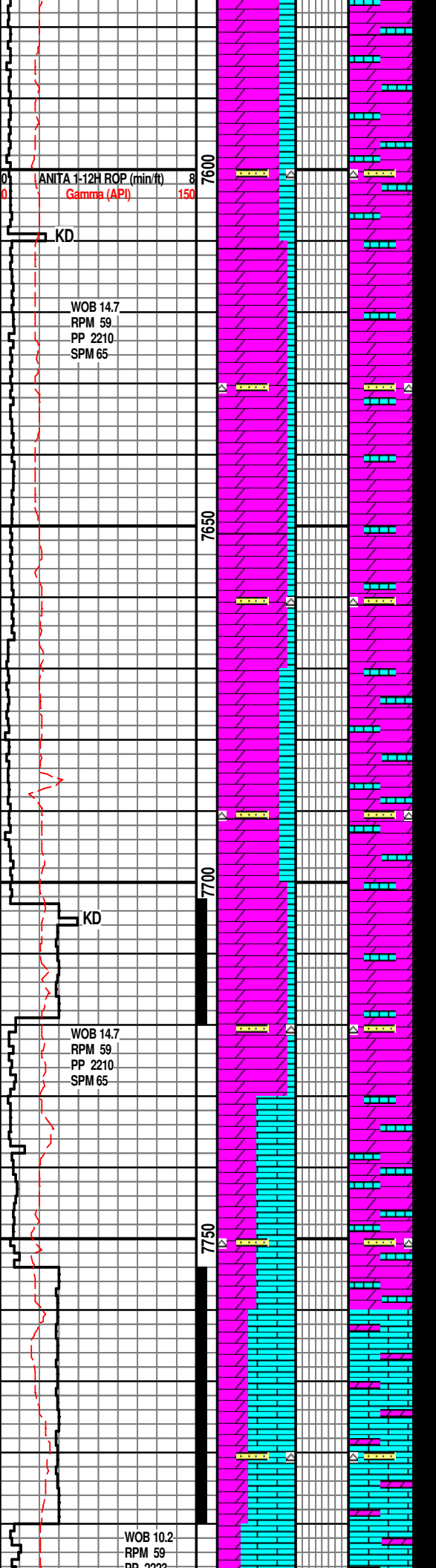
LS: OFF WHT-WHT, OOL, MICRO/XLN, BLKY-S/BLKY, FRM, TRS CHRT: OFF WHT, CLR, HD, DOL: LT-MED BRN, MICRO/SUC, SNDY, S/BLKY, MOD FRM-HD, V/SL TRS SS: MED/LT BRN, SME TAN, CONSOL, MED-CRSE GRN, WL-SRT, POORLY CMT, HD GRNS, SME EMBD SHALE, TRS SH: SL/TRS MOSTLY BLK, SME GRY, SL/TRS RED, BLKY, MICA, MOD FRM, RGH TXT, WK-FR CUT, THIN BLU-GREEN RING

LS: OFF WHT-WHT, OOL, MICRO/XLN, BLKY-S/BLKY, FRM, TRS CHRT: OFF WHT, CLR, HD, DOL: LT-MED BRN, MICRO/SUC, SNDY, S/BLKY, MOD FRM-HD, V/SL TRS SS: MED/LT BRN, SME TAN, CONSOL, MED-CRSE GRN, WL-SRT, POORLY CMT, HD GRNS, SME EMBD SHALE, FR CUT, THICK BLU-GREEN RING

SURVEY: 7,559' MD 5,281' TVD  
INC. 89.7 / AZ. 178.4

LS: OFF WHT-WHT, OOL, MICRO/XLN, BLKY-S/BLKY, FRM, TRS CHRT: OFF





WHT, CLR, HD, DOL: LT-MED BRN, MICRO/SUC, SNDY, S/BLKY, MOD FRM-HD, V/SL TRS SS: MED/LT BRN, SME TAN, CONSOL, MED-CRSE GRN, WL-SRT, POORLY CMT, HD GRNS, SME EMBD SHALE, GD CUT, THICK BLU-GREEN RING

LS: OFF WHT-WHT, OOL, MICRO/XLN, BLKY-S/BLKY, FRM, TRS CHRT: OFF WHT, CLR, HD, DOL: LT-MED BRN, MICRO/SUC, SNDY, S/BLKY, MOD FRM-HD, V/SL TRS SS: MED/LT BRN, SME TAN, CONSOL, MED-CRSE GRN, WL-SRT, POORLY CMT, HD GRNS, SME EMBD SHALE, FR-GD CUT, THICK BLU-GREEN RING

SURVEY: 7,653' MD 5,283' TVD  
INC. 87.9 / AZ. 176.6

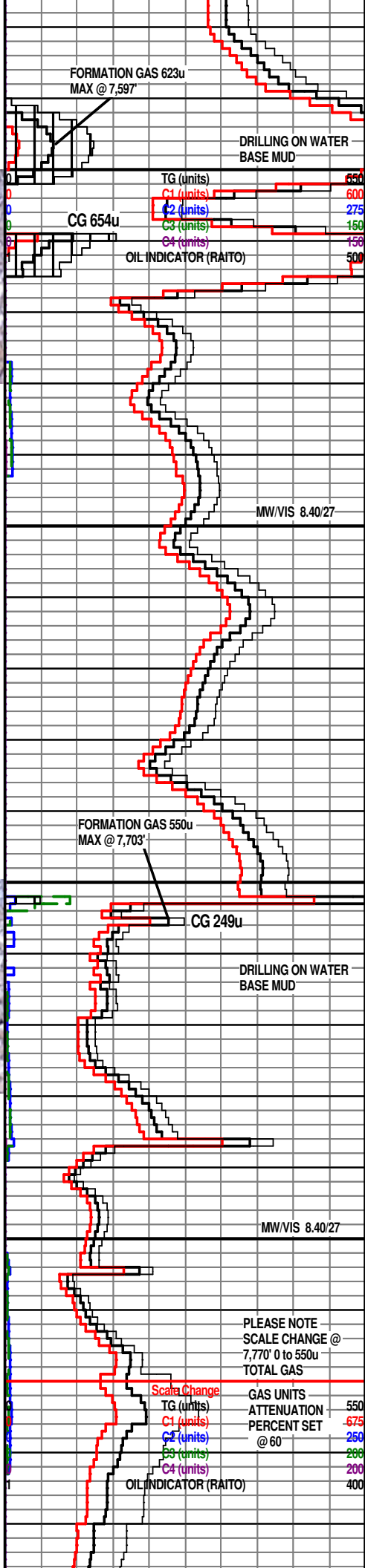
LS: OFF WHT-WHT, OOL, MICRO/XLN, BLKY-S/BLKY, FRM, TRS CHRT: OFF WHT, CLR, HD, DOL: LT-MED BRN, MICRO/SUC, SNDY, S/BLKY, MOD FRM-HD, V/SL TRS SS: MED/LT BRN, SME TAN, CONSOL, MED-CRSE GRN, WL-SRT, POORLY CMT, HD GRNS, SME EMBD SHALE, GD CUT, THICK BLU-GREEN RING

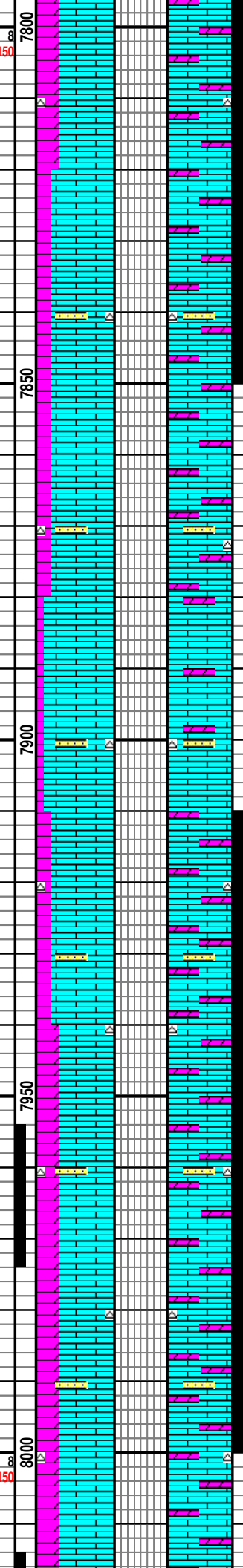
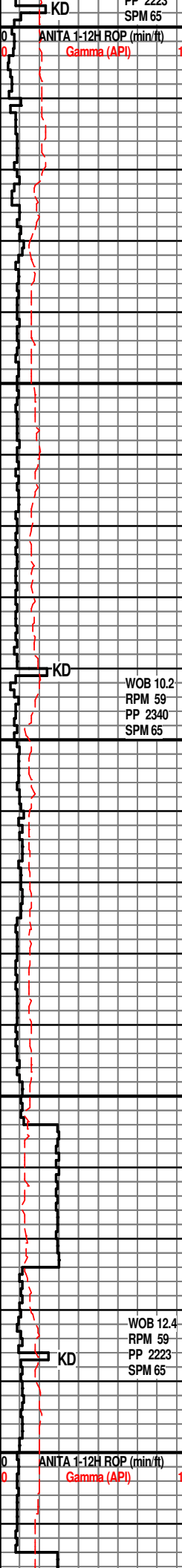
LS: OFF WHT-WHT, OOL, MICRO/XLN, BLKY-S/BLKY, FRM, TRS CHRT: OFF WHT, CLR, HD, DOL: LT-MED BRN, MICRO/SUC, SNDY, S/BLKY, MOD FRM-HD, V/SL TRS SS: MED/LT BRN, SME TAN, CONSOL, MED-CRSE GRN, WL-SRT, POORLY CMT, HD GRNS, SME EMBD SHALE, FR-GD CUT, THICK BLU-GREEN RING

SURVEY: 7,748' MD 5,284' TVD  
INC. 90.5 / AZ. 177.2

LS: OFF WHT-WHT, OOL, MICRO/XLN, BLKY-S/BLKY, FRM, TRS CHRT: OFF WHT, CLR, HD, DOL: LT-MED BRN, MICRO/SUC, SNDY, S/BLKY, MOD FRM-HD, V/SL TRS SS: MED/LT BRN, SME TAN, CONSOL, MED-CRSE GRN, WL-SRT, POORLY CMT, HD GRNS, SME EMBD SHALE, GD CUT, THICK BLU-GREEN RING

LS: OFF WHT-WHT, OOL, MICRO/XLN, BLKY-S/BLKY, FRM, TRS CHRT: OFF WHT, CLR, HD, DOL: LT-MED BRN,





MICRO/SUC, SNDY, S/BLKY, MOD FRM-HD, FR-GD CUT, THICK BLU-GREEN RING

LS: OFF WHT-WHT, OOL, MICRO/XLN, BLKY-S/BLKY, FRM, TRS CHRT: OFF WHT, CLR, HD, DOL: LT-MED BRN, MICRO/SUC, SNDY, S/BLKY, MOD FRM-HD, V/SL TRS SS: MED/LT BRN, SME TAN, CONSOL, MED-CRSE GRN, WL-SRT, POORLY CMT, HD GRNS, SME EMBD SHALE, GD CUT, THICK BLU-GREEN RING

SURVEY: 7,842' MD 5,282' TVD  
INC. 92.2 / AZ. 179.0

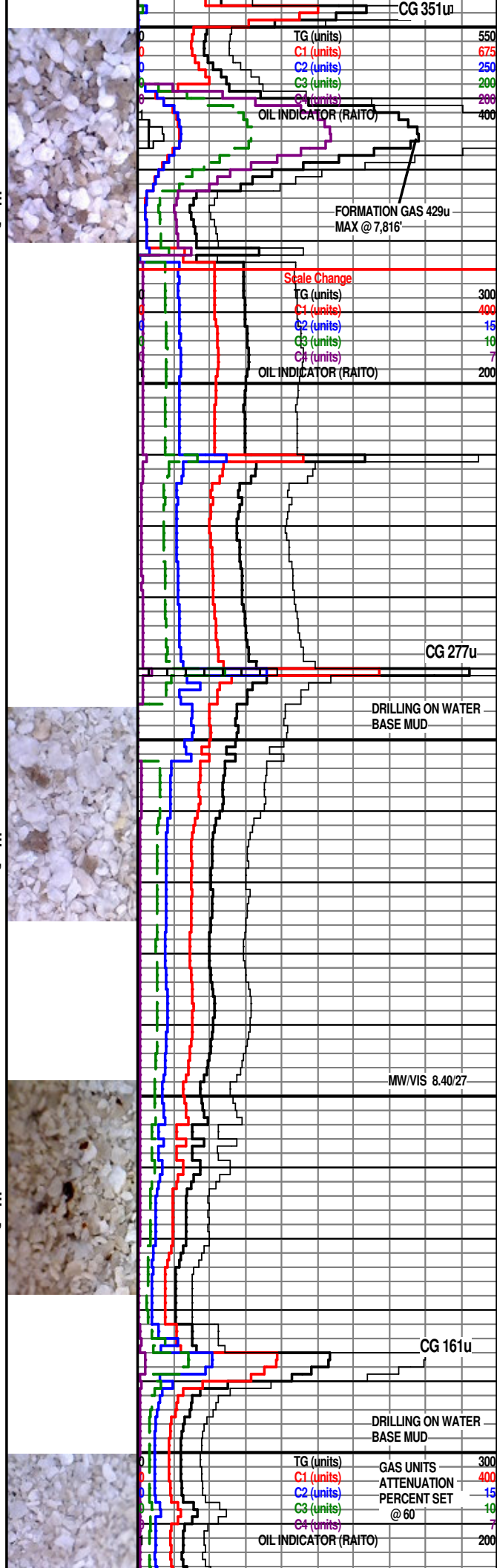
LS: OFF WHT TO WHT, SME STN, MICRO-XLN, MOD-V/HD TO BRTL, BLKY, DOL: LT-MED TAN, SME STN, MICRO-XLN, S/BLKY, SL/SNDY TXT, V/SL TRS SS: MED/LT BRN, SME TAN, CONSOL, MED-CRSE GRN, WL-SRT, POORLY CMT, HD GRNS, SME EMBD SHALE, TRS CHRT: OFF WHT, CLR, NO CUT, NO RING

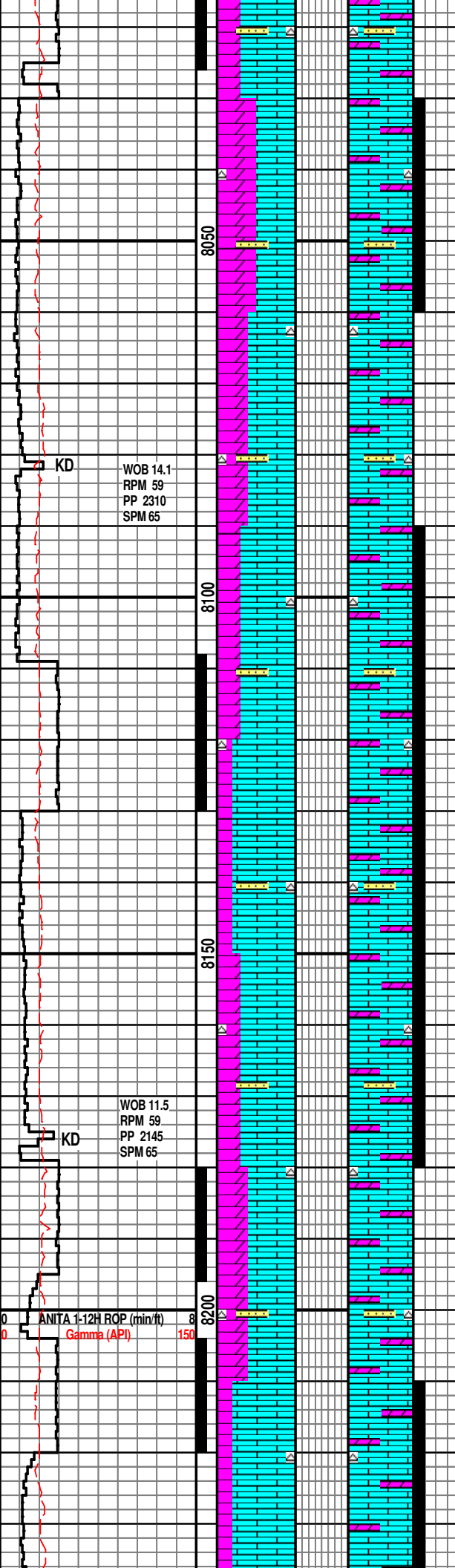
LS: OFF WHT-WHT, OOL, MICRO/XLN, BLKY-S/BLKY, FRM, TRS CHRT: OFF WHT, CLR, HD, DOL: LT-MED BRN, MICRO/SUC, SNDY, S/BLKY, MOD FRM-HD, V/SL TRS SS: MED/LT BRN, SME TAN, CONSOL, MED-CRSE GRN, WL-SRT, POORLY CMT, HD GRNS, SME EMBD SHALE, WK CUT, THIN BLU-GREEN RING

SURVEY: 7,936' MD 5,277' TVD  
INC. 93.9 / AZ. 178.1

LS: OFF WHT-WHT, OOL, MICRO/XLN, BLKY-S/BLKY, FRM, TRS CHRT: OFF WHT, CLR, HD, DOL: OFF WHT TO-WHT, SME LT-MED BRN, SME MICRO-XLN, MICRO/SUC, SL/SNDY, S/BLKY, MOD FRM-HD, V/SL TRS SS: MED/LT BRN, SME TAN, CONSOL, MED-CRSE GRN, WL-SRT, POORLY CMT, HD GRNS, SME EMBD SHALE, WK CUT, THIN BLU-GREEN RING

LS: OFF WHT-WHT, OOL, MICRO/XLN, BLKY-S/BLKY, FRM, TRS CHRT: OFF WHT, CLR, HD, DOL: OFF WHT TO-WHT, SME LT-MED BRN, SME MICRO-XLN, MICRO/SUC, SL/SNDY, S/BLKY, MOD FRM-HD, V/SL TRS SS: MED/LT BRN, SME TAN, CONSOL, MED-CRSE GRN, WL-SRT, POORLY CMT, HD GRNS, SME EMBD SHALE, WK CUT, THIN BLU-GREEN RING





SURVEY: 8,031' MD 5,273' TVD  
INC. 91.0 / AZ. 178.8

LS: OFF WHT-WHT, OOL, MICRO/XLN,  
BLKY-S/BLKY, FRM, TRS CHRT: OFF  
WHT, CLR, HD, DOL: OFF WHT TO-WHT,  
SME LT-MED BRN, SME MICRO-XLN,  
MICRO/SUC, SL/SNDY, S/BLKY, MOD  
FRM-HD, V/SL TRS SS: MED/LT BRN, SME  
TAN, CONSOL, MED-CRSE GRN, WL-SRT,  
POORLY CMT, HD GRNS, SME EMBD  
SHALE, WK CUT, THIN BLU-GREEN RING

LS: OFF WHT-WHT, OOL, MICRO/XLN,  
BLKY-S/BLKY, FRM, TRS CHRT: OFF  
WHT, CLR, HD, DOL: OFF WHT TO-WHT,  
SME LT-MED BRN, SME MICRO-XLN,  
MICRO/SUC, SL/SNDY, S/BLKY, MOD  
FRM-HD, V/SL TRS SS: MED/LT BRN, SME  
TAN, CONSOL, MED-CRSE GRN, WL-SRT,  
POORLY CMT, HD GRNS, SME EMBD  
SHALE, WK CUT, THIN BLU-GREEN RING

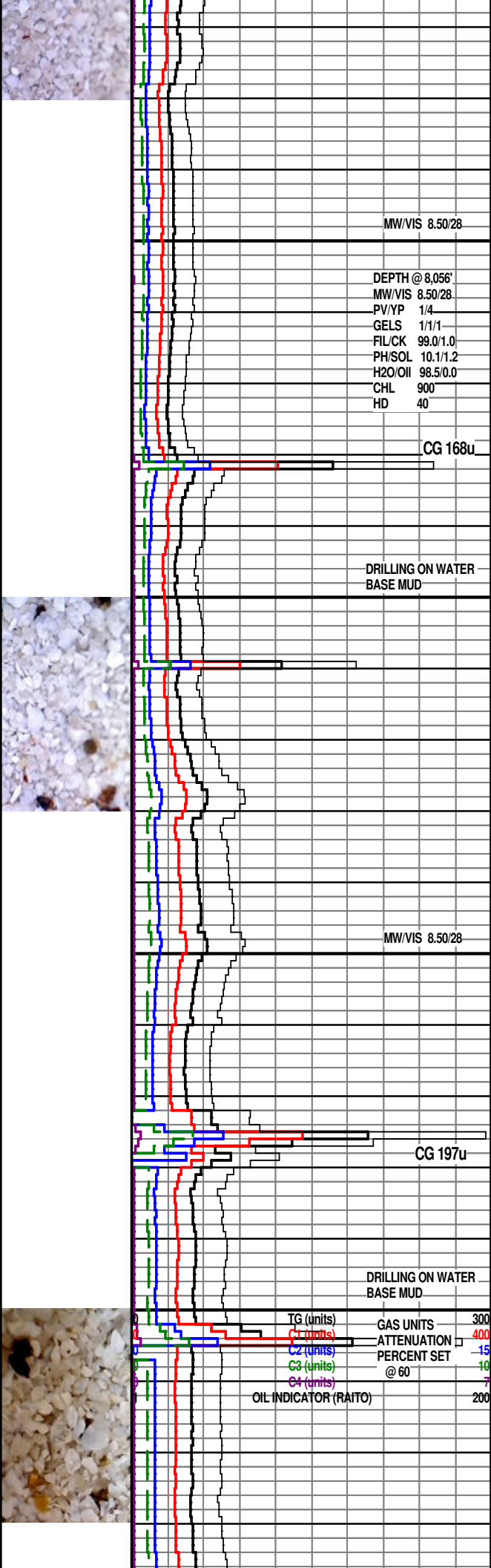
SURVEY: 8,125' MD 5,271' TVD  
INC. 90.9 / AZ. 180.0

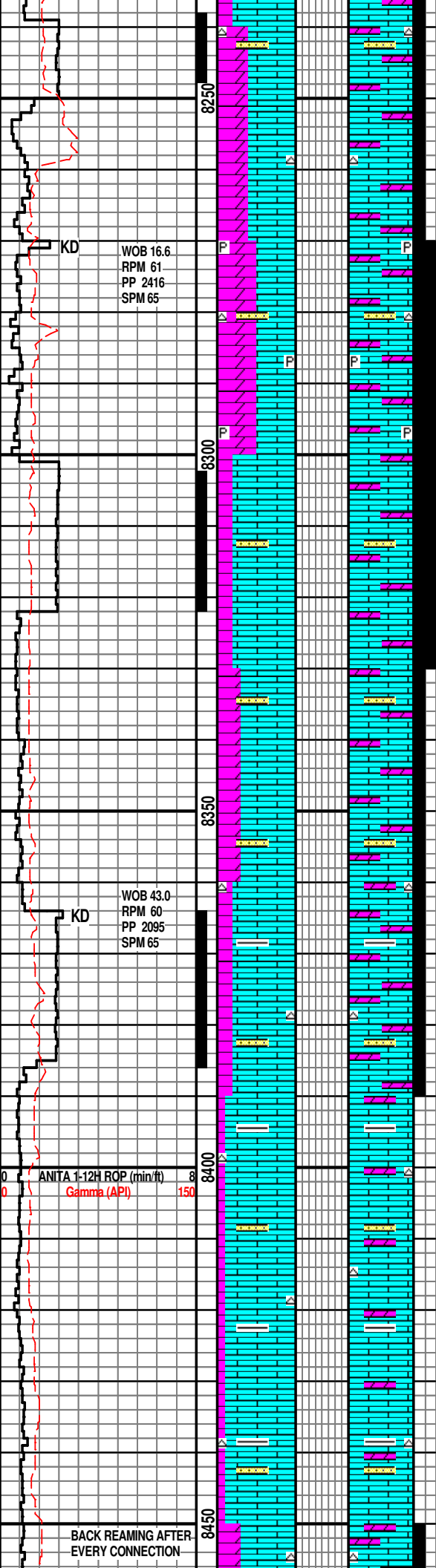
LS: OFF WHT-WHT, OOL, MICRO/XLN,  
BLKY-S/BLKY, FRM, TRS CHRT: OFF  
WHT, CLR, HD, DOL: OFF WHT TO-WHT,  
SME LT-MED BRN, SME MICRO-XLN,  
MICRO/SUC, SL/SNDY, S/BLKY, MOD  
FRM-HD, V/SL TRS SS: MED/LT BRN, SME  
TAN, CONSOL, MED-CRSE GRN, WL-SRT,  
POORLY CMT, HD GRNS, SME EMBD  
SHALE, WK CUT, THIN BLU-GREEN RING

LS: OFF WHT TO WHT, SME STN,  
MICRO-XLN, MOD-V/HD TO BRTL, BLKY,  
DOL: OFF WHT TO-WHT, SME LT-MED  
BRN, SME STN, MICRO-XLN, S/BLKY,  
SL/SNDY TXT, V/SL TRS SS: MED/LT  
BRN, SME TAN, CONSOL, MED-CRSE  
GRN, WL-SRT, POORLY CMT, HD GRNS,  
SME EMBD SHALE, TRS CHRT: OFF  
WHT, CLR, HD VF-F-XLN, NO CUT, NO  
RING

SURVEY: 8,220' MD 5,273' TVD  
INC. 87.1 / AZ. 180.9

LS: OFF WHT-WHT, OOL, MICRO/XLN,  
BLKY-S/BLKY, FRM, TRS CHRT: OFF  
WHT, CLR, HD VF-F-XLN, DOL: LT-MED





WHT, CLR, HD VF-F-XLN, DOL: LT-MED BRN, MICRO/SUC, MICRO-XLN, SNDY, S/BLKY, MOD FRM-HD, V/SL TRS SS: MED/LT BRN, SME TAN, CONSOL, MED-CRSE GRN, WL-SRT, POORLY CMT, HD GRNS, SL/TRS PYR, WK CUT, THIN BLU-GREEN RING

LS: OFF WHT TO WHT, SME STN, MICRO-XLN, OOL, MOD-V/HD TO BRTL, BLKY, V/SL TRS SS: MED/LT BRN, SME TAN, CONSOL, MED-CRSE GRN, WL-SRT, POORLY CMT, HD GRNS, DOL: OFF WHT-WHT, LT-MED TAN, MICRO-XLN, MICRO/SUC, S/BLKY, SL/SNDY TXT, SL/TRS PYR, TRS CHRT: OFF WHT, CLR, HD VF-F-XLN, FAIR CUT, THIN BLU-GREEN RING

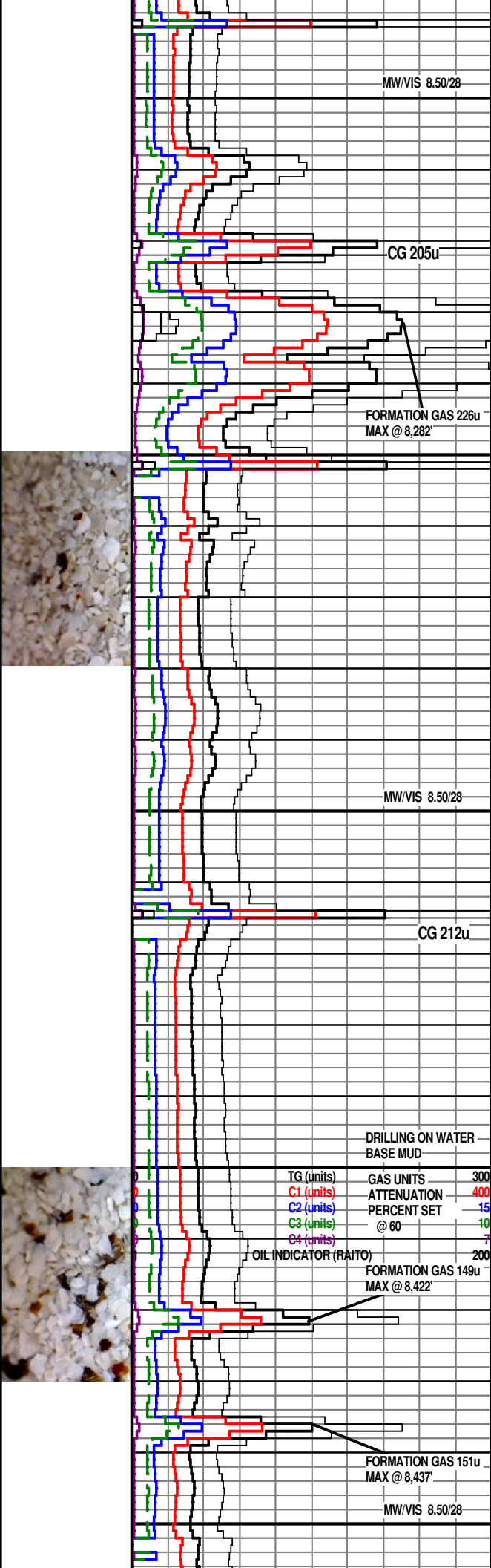
SURVEY: 8,314' MD 5,280' TVD  
INC. 84.5 / AZ. 180.7

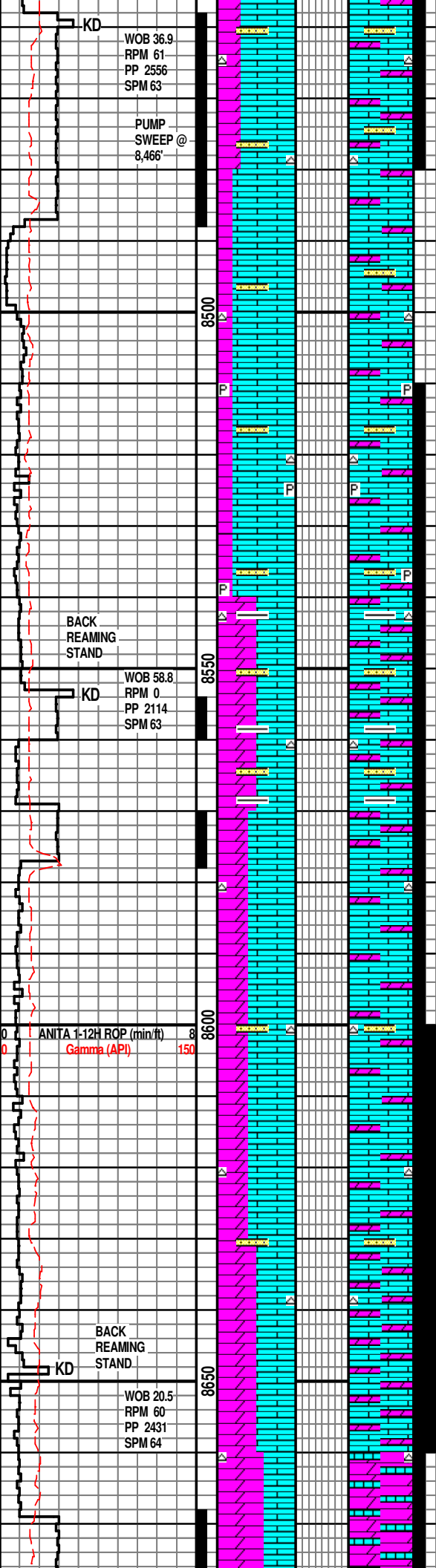
LS: OFF WHT-WHT, OOL, MICRO/XLN, BLKY-S/BLKY, FRM, TRS CHRT: OFF WHT, CLR, HD VF-F-XLN, DOL: LT-MED BRN, MICRO/SUC, MICRO-XLN, SNDY, S/BLKY, MOD FRM-HD, V/SL TRS SS: MED/LT BRN, SME TAN, CONSOL, MED-CRSE GRN, WL-SRT, POORLY CMT, HD GRNS, WK CUT, THIN BLU-GREEN RING

LS: OFF WHT-WHT, OOL, MICRO/XLN, BLKY-S/BLKY, FRM, TRS CHRT: OFF WHT, CLR, HD VF-F-XLN, DOL: LT-MED BRN, MICRO/SUC, MICRO-XLN, SNDY, S/BLKY, MOD FRM-HD, TRS SH: SL/TRS MOSTLY BLK, SME GRY, V/SL TRS SS: MED/LT BRN, SME TAN, CONSOL, MED-CRSE GRN, WL-SRT, POORLY CMT, HD GRNS, WK CUT, THIN BLU-GREEN RING

SURVEY: 8,409' MD 5,287' TVD  
INC. 86.7 / AZ. 180.2

LS: OFF WHT-WHT, OOL, MICRO/XLN, BLKY-S/BLKY, FRM, TRS CHRT: OFF WHT, CLR, HD, VF-F-XLN, DOL: OFF WHT TO WHT, SME LT-MED BRN, MICRO-XLN, MICRO/SUC, SL/SNDY, S/BLKY, MOD FRM-HD, TRS SH: SL/TRS MOSTLY BLK, SME GRY, V/SL TRS SS: MED/LT BRN, SME TAN, CONSOL, MED-CRSE GRN, WL-SRT, POORLY CMT, HD GRNS, NO CUT, NO RING





LS: OFF WHT-WHT, OOL, MICRO/XLN, BLKY-S/BLKY, FRM, TRS CHRT: OFF WHT, CLR, HD, VF-F-XLN, DOL: LT-MED BRN, MICRO/SUC, MICRO-XLN, SL/SNDY, S/BLKY, MOD FRM-HD, V/SL TRS SS: MED/LT BRN, SME TAN, CONSOL, MED-CRSE GRN, WL-SRT, POORLY CMT, HD GRNS, WK CUT, THIN BLU-GREEN RING

SURVEY: 8,503' MD 5,291' TVD  
INC. 88.8 / AZ. 179.0

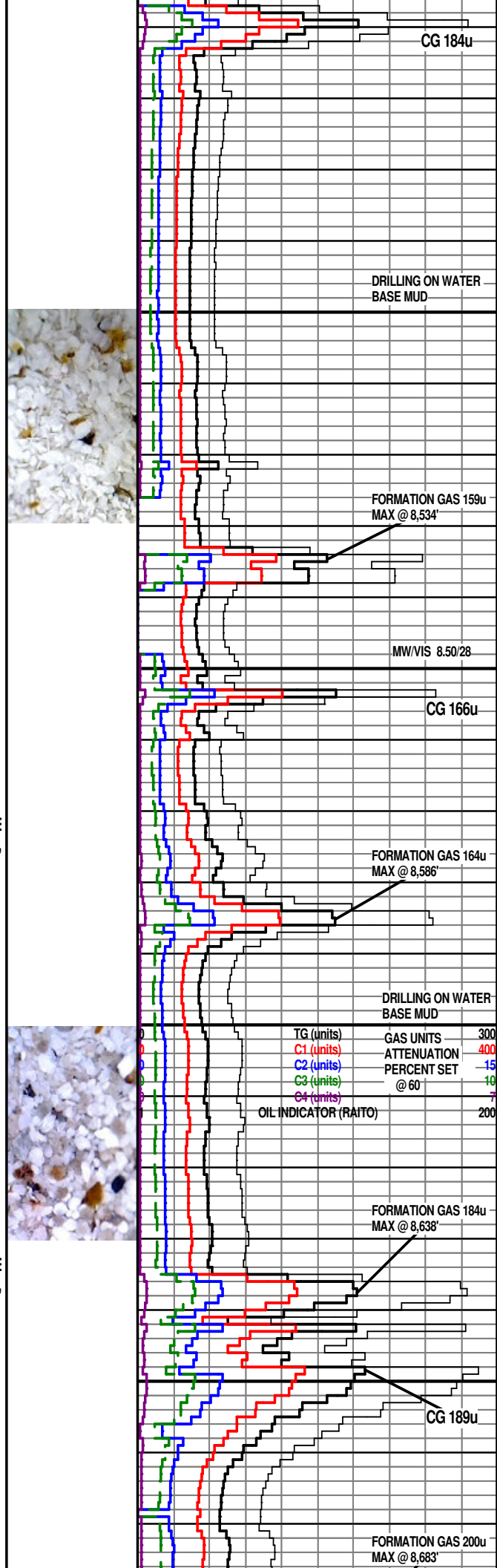
LS: OFF WHT-WHT, OOL, MICRO/XLN, BLKY-S/BLKY, FRM, TRS CHRT: OFF WHT, CLR, HD, VF-F-XLN, TRS PRY, DOL: OFF WHT TO-WHT, SME LT-MED BRN, MICRO-XLN, MICRO/SUC, SL/SNDY, S/BLKY, MOD FRM-HD, V/SL TRS SS: MED/LT BRN, SME TAN, CONSOL, MED-CRSE GRN, WL-SRT, POORLY CMT, HD GRNS, WK CUT, THIN BLU-GREEN RING

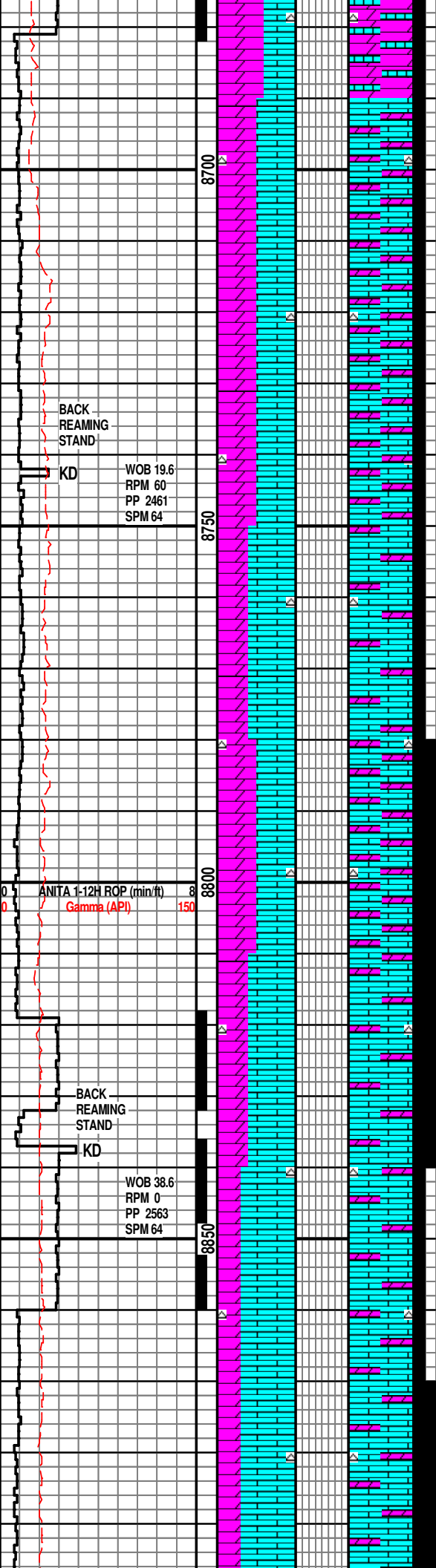
LS: OFF WHT-WHT, OOL, MICRO/XLN, BLKY-S/BLKY, FRM, TRS CHRT: OFF WHT, CLR, HD, VF-F-XLN, DOL: LT-MED BRN, OFF WHT-WHT, MICRO/SUC, MICRO-XLN, SL/SNDY, S/BLKY, MOD FRM-HD, V/SL TRS SS: MED/LT BRN, SME TAN, CONSOL, MED-CRSE GRN, WL-SRT, POORLY CMT, HD GRNS, WK CUT, THIN BLU-GREEN RING

SURVEY: 8,598' MD 5,292' TVD  
INC. 90.0 / AZ. 178.8

LS: OFF WHT-WHT, OOL, MICRO/XLN, BLKY-S/BLKY, FRM, TRS CHRT: OFF WHT, CLR, HD, VF-F-XLN, DOL: LT-MED BRN, OFF WHT-WHT, MICRO/SUC, MICRO-XLN, SL/SNDY, S/BLKY, MOD FRM-HD, V/SL TRS SS: MED/LT BRN, SME TAN, CONSOL, MED-CRSE GRN, WL-SRT, POORLY CMT, HD GRNS, FAIR CUT, THIN BLU-GREEN RING

LS: OFF WHT-WHT, OOL, FRM-HD, MICRO/XLN, BLKY-S/BLKY, TRS CHRT: OFF WHT, CLR, HD, VF-F-XLN, DOL: LT-MED BRN, OFF WHT-WHT.





MICRO/SUC, MICRO-XLN, SL/SNDY, S/BLKY, MOD FRM-HD, WEAK CUT, THIN BLU-GREEN RING

SURVEY: 8,692' MD 5,290' TVD  
INC. 92.2 / AZ. 178.4

LS: OFF WHT-WHT, OOL, FRM-HD, MICRO/XLN, BLKY-S/BLKY, TRS CHRT: OFF WHT, CLR, HD, VF-F-XLN, DOL: LT-MED BRN, OFF WHT-WHT, MICRO/SUC, MICRO-XLN, SL/SNDY, S/BLKY, MOD FRM-HD, WEAK CUT, THIN BLU-GREEN RING

SURVEY: 8,724' MD 5,289' TVD  
INC. 92.4 / AZ. 178.0

LS: OFF WHT-WHT, OOL, FRM-HD, MICRO/XLN, BLKY-S/BLKY, TRS CHRT: OFF WHT, CLR, HD, VF-F-XLN, DOL: LT-MED BRN, OFF WHT-WHT, MICRO/SUC, MICRO-XLN, SL/SNDY, S/BLKY, MOD FRM-HD, WEAK CUT, THIN BLU-GREEN RING

SURVEY: 8,755' MD 5,287' TVD  
INC. 92.7 / AZ. 178.0

LS: OFF WHT-WHT, OOL, FRM-HD, MICRO/XLN, BLKY-S/BLKY, TRS CHRT: OFF WHT, CLR, HD, VF-F-XLN, DOL: LT-MED BRN, OFF WHT-WHT, MICRO/SUC, MICRO-XLN, SL/SNDY, S/BLKY, MOD FRM-HD, WK CUT, THIN BLU-GREEN RING

SURVEY: 8,787' MD 5,286' TVD  
INC. 93.3 / AZ. 177.7

LS: OFF WHT-WHT, OOL, FRM-HD, MICRO/XLN, BLKY-S/BLKY, TRS CHRT: OFF WHT, CLR, HD, VF-F-XLN, DOL: LT-MED BRN, OFF WHT-WHT, MICRO/SUC, MICRO-XLN, SL/SNDY, S/BLKY, MOD FRM-HD, FAIR CUT, THIN BLU-GREEN RING

SURVEY: 8,818' MD 5,284' TVD  
INC. 92.6 / AZ. 177.3

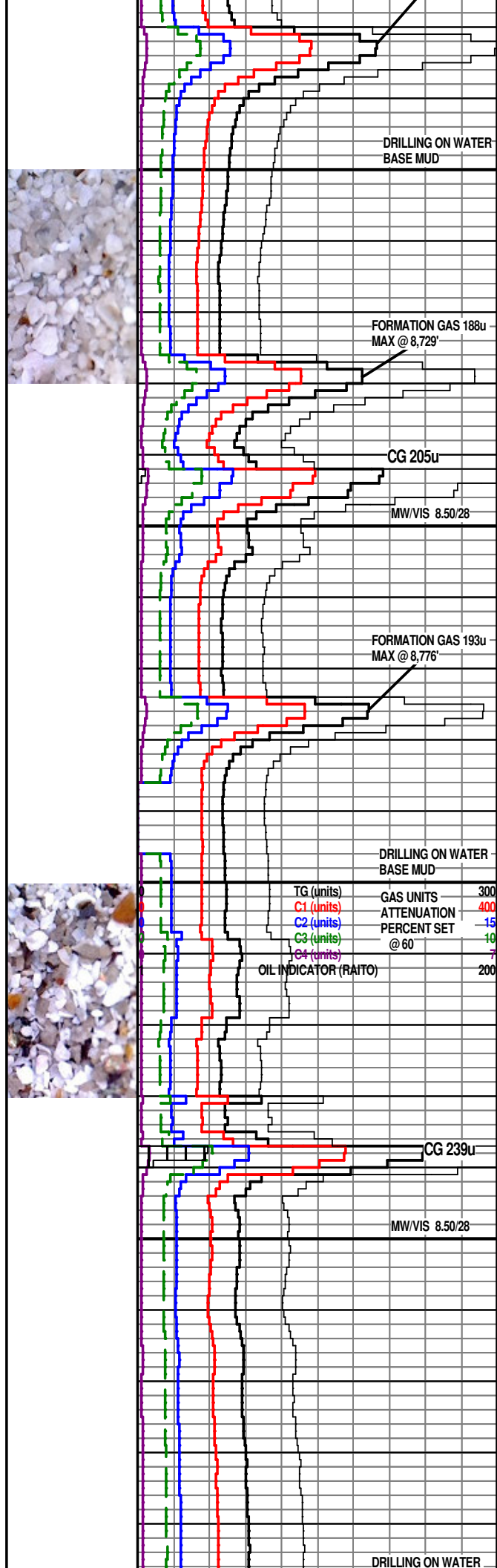
LS: OFF WHT-WHT, OOL, FRM-HD, MICRO/XLN, BLKY-S/BLKY, TRS CHRT: OFF WHT, CLR, HD, VF-F-XLN, DOL: LT-MED BRN, OFF WHT-WHT, MICRO/SUC, MICRO-XLN, SL/SNDY, S/BLKY, MOD FRM-HD, FAIR-WEAK CUT, THIN BLU-GREEN RING

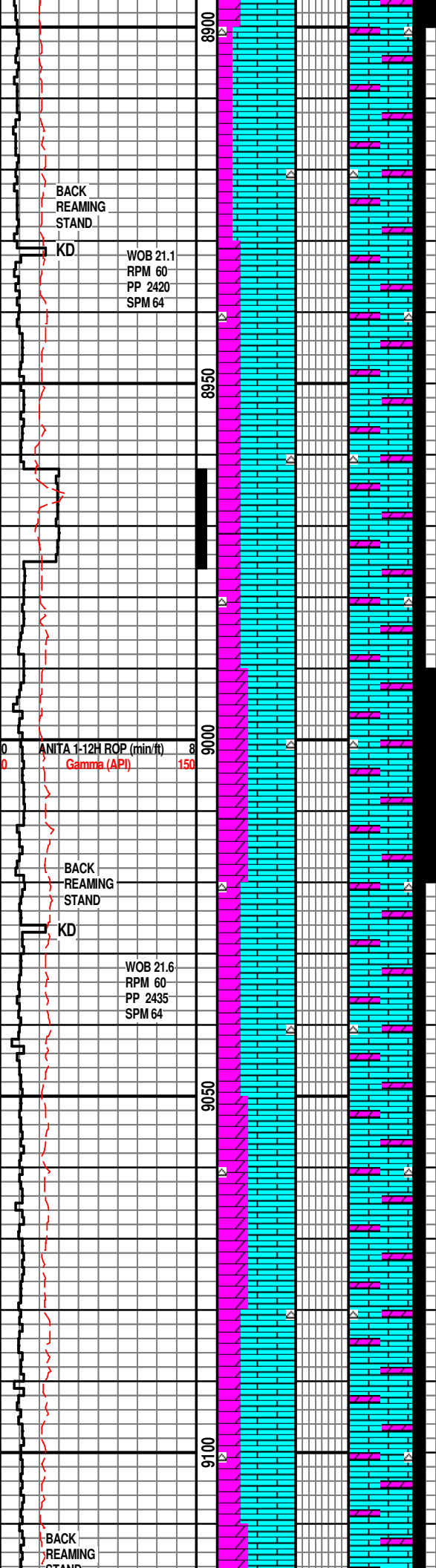
SURVEY: 8,849' MD 5,284' TVD  
INC. 89.2 / AZ. 178.6

LS: OFF WHT-WHT, OOL, FRM-HD, MICRO/XLN, BLKY-S/BLKY, TRS CHRT: OFF WHT, CLR, HD, VF-F-XLN, DOL: LT-MED BRN, OFF WHT-WHT, MICRO/SUC, MICRO-XLN, SL/SNDY, S/BLKY, MOD FRM-HD, WEAK-FAIR CUT, THIN BLU-GREEN RING

SURVEY: 8,881' MD 5,284' TVD  
INC. 87.9 / AZ. 178.8

LS: OFF WHT-WHT, OOL, FRM-HD, MICRO/XLN, BLKY-S/BLKY, TRS CHRT: OFF WHT, CLR, HD, VF-F-XLN, DOL:





LT-MED BRN, OFF WHT-WHT, MICRO/SUC, MICRO-XLN, SL/SNDY, S/BLKY, MOD FRM-HD, FAIR-WEAK CUT, THIN BLU-GREEN RING

SURVEY: 8,912' MD 5,285' TVD  
INC. 88.0 / AZ. 178.8

LS: OFF WHT-WHT, OOL, FRM-HD, MICRO/XLN, BLKY-S/BLKY, TRS CHRT: OFF WHT, CLR, HD, VF-F-XLN, DOL: LT-MED BRN, OFF WHT-WHT, MICRO/SUC, MICRO-XLN, SL/SNDY, S/BLKY, MOD FRM-HD, WEAK CUT, THIN BLU-GREEN RING

SURVEY: 8,944' MD 5,286' TVD  
INC. 88.2 / AZ. 178.9

LS: OFF WHT-WHT, OOL, FRM-HD, MICRO/XLN, BLKY-S/BLKY, TRS CHRT: OFF WHT, CLR, HD, VF-F-XLN, DOL: LT-MED BRN, OFF WHT-WHT, MICRO/SUC, MICRO-XLN, SL/SNDY, S/BLKY, MOD FRM-HD, WEAK CUT, THIN BLU-GREEN RING

SURVEY: 8,976' MD 5,287' TVD  
INC. 89.8 / AZ. 180.2

LS: OFF WHT-WHT, OOL, FRM-HD, SME SL/MICRO/XLN, CRS ANG GRN, BLKY-S/BLKY, TRS CHRT: OFF WHT, CLR, HD, VF-F-XLN, DOL: OFF WHT-WHT, MICRO-XLN, SL/SNDY, S/BLKY, MOD FRM-HD, FAIR CUT, THIN BLU-GREEN RING

SURVEY: 9,007' MD 5,287' TVD  
INC. 91.6 / AZ. 180.2

LS: OFF WHT-WHT, OOL, FRM-HD, SME SL/MICRO/XLN, CRS ANG GRN, BLKY-S/BLKY, TRS CHRT: OFF WHT, CLR, HD, VF-F-XLN, DOL: OFF WHT-WHT, MICRO-XLN, SL/SNDY, S/BLKY, MOD FRM-HD, FAIR-WEAK CUT, THIN BLU-GREEN RING

SURVEY: 9,039' MD 5,286' TVD  
INC. 91.9 / AZ. 179.7

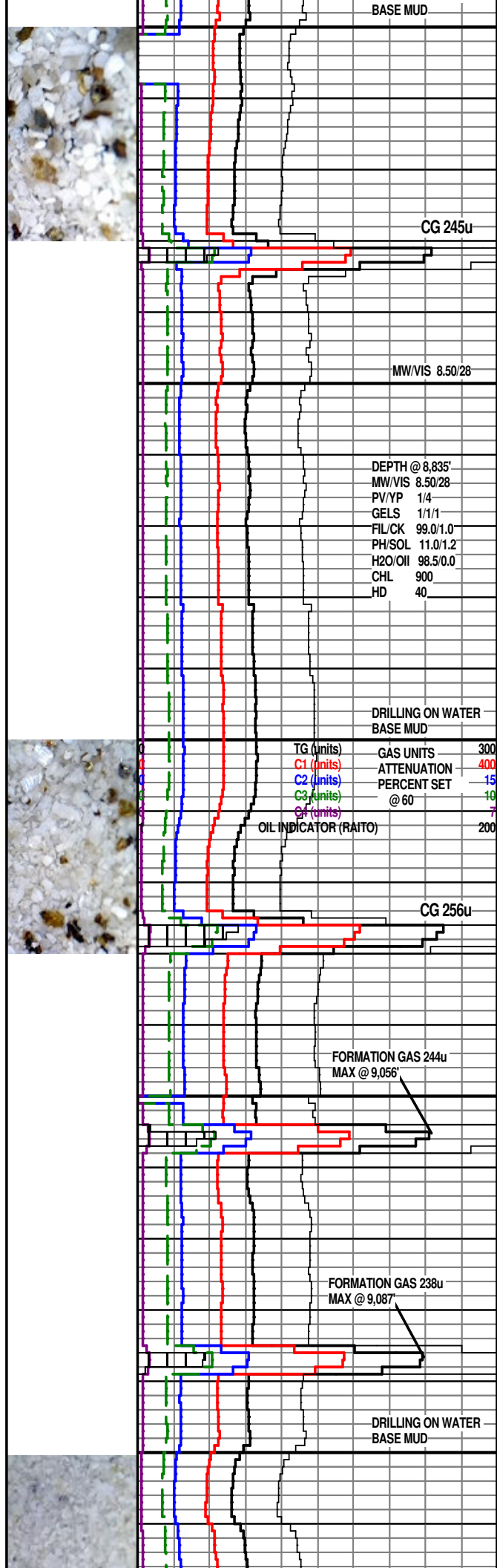
LS: OFF WHT-WHT, OOL, FRM-HD, SME SL/MICRO/XLN, CRS ANG GRN, BLKY, TRS CHRT: WHT, TRANS/CLR, HD, VF-F-XLN, DOL: OFF WHT-WHT, MICRO-XLN, SL/SNDY, S/BLKY, MOD FRM-HD, WEAK CUT, THIN BLU-GREEN RING

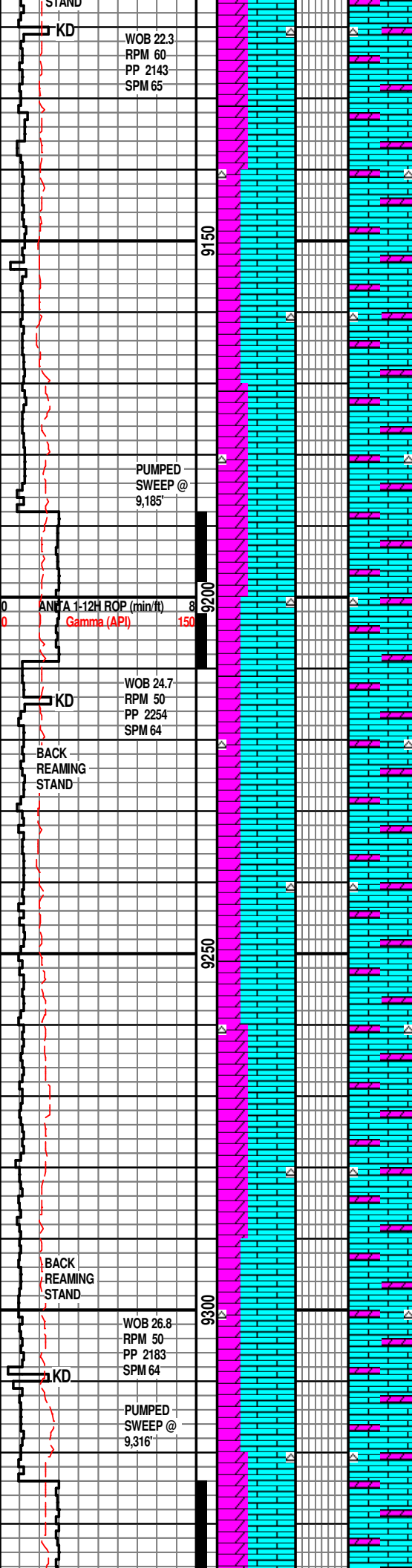
SURVEY: 9,070' MD 5,285' TVD  
INC. 91.7 / AZ. 179.6

LS: OFF WHT-WHT, OOL, FRM-HD, SME SL/MICRO/XLN, CRS ANG GRN, BLKY, TRS CHRT: WHT, TRANS/CLR, HD, VF-F-XLN, DOL: OFF WHT-WHT, MICRO-XLN, SL/SNDY, S/BLKY, MOD FRM-HD, WEAK CUT, THIN BLU-GREEN RING

SURVEY: 9,101' MD 5,284' TVD  
INC. 91.8 / AZ. 179.4

LS: OFF WHT-WHT, OOL, FRM-HD, SME SL/MICRO/XLN, CRS ANG GRN, BLKY, TRS CHRT: WHT, TRANS/CLR, HD,





VF-F-XLN, DOL: OFF WHT-WHT, MICRO-XLN, SL/SNDY, S/BLKY, MOD FRM-HD, WEAK CUT, THIN BLU-GREEN RING

SURVEY: 9,133' MD 5,283' TVD  
INC. 91.9 / AZ. 178.7

LS: OFF WHT-WHT, OOL, FRM-HD, SME SL/MICRO/XLN, CRS ANG GRN, BLKY, TRS CHRT: WHT, TRANS/CLR, HD, VF-F-XLN, DOL: OFF WHT-WHT, MICRO-XLN, SL/SNDY, S/BLKY, MOD FRM-HD, NO CUT, NO RING

SURVEY: 9,164' MD 5,282' TVD  
INC. 91.6 / AZ. 178.4

LS: OFF WHT-WHT, OOL, FRM-HD, SME SL/MICRO/XLN, CRS ANG GRN, BLKY, TRS CHRT: WHT, TRANS/CLR, HD, VF-F-XLN, DOL: OFF WHT-WHT, MICRO-XLN, SL/SNDY, S/BLKY, MOD FRM-HD, WEAK CUT, THIN BLU-GREEN RING

SURVEY: 9,196' MD 5,281' TVD  
INC. 90.0 / AZ. 178.5

LS: OFF WHT-WHT, OOL, FRM-HD, SME SL/MICRO/XLN, CRS ANG GRN, BLKY, TRS CHRT: WHT, TRANS/CLR, HD, VF-F-XLN, DOL: OFF WHT-WHT, MICRO-XLN, SL/SNDY, S/BLKY, MOD FRM-HD, NO CUT, NO RING

SURVEY: 9,227' MD 5,282' TVD  
INC. 88.3 / AZ. 178.2

LS: OFF WHT-WHT, OOL, FRM-HD, SME SL/MICRO/XLN, CRS ANG GRN, BLKY, TRS CHRT: WHT, TRANS/CLR, HD, VF-F-XLN, DOL: OFF WHT-WHT, MICRO-XLN, SL/SNDY, S/BLKY, MOD FRM-HD, NO CUT, NO RING

SURVEY: 9,259' MD 5,283' TVD  
INC. 87.3 / AZ. 178.2

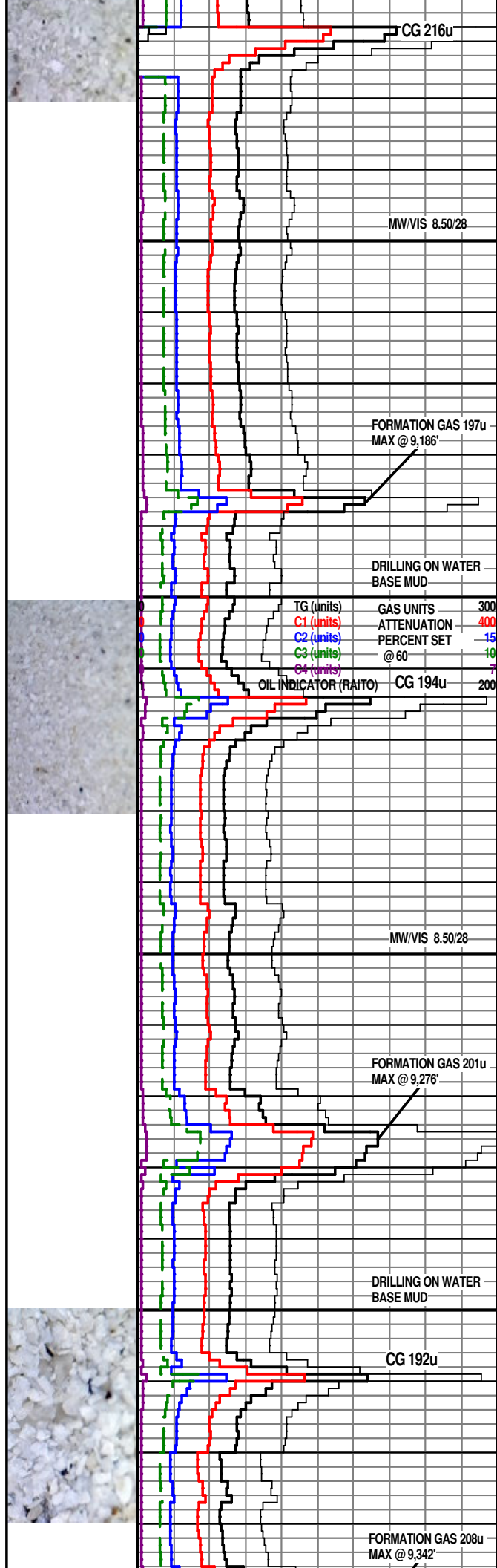
LS: OFF WHT-WHT, OOL, FRM-HD, SME SL/MICRO/XLN, CRS ANG GRN, BLKY, TRS CHRT: WHT, TRANS/CLR, HD, VF-F-XLN, DOL: OFF WHT-WHT, MICRO-XLN, SL/SNDY, S/BLKY, MOD FRM-HD, WEAK CUT, THIN BLU-GREEN RING

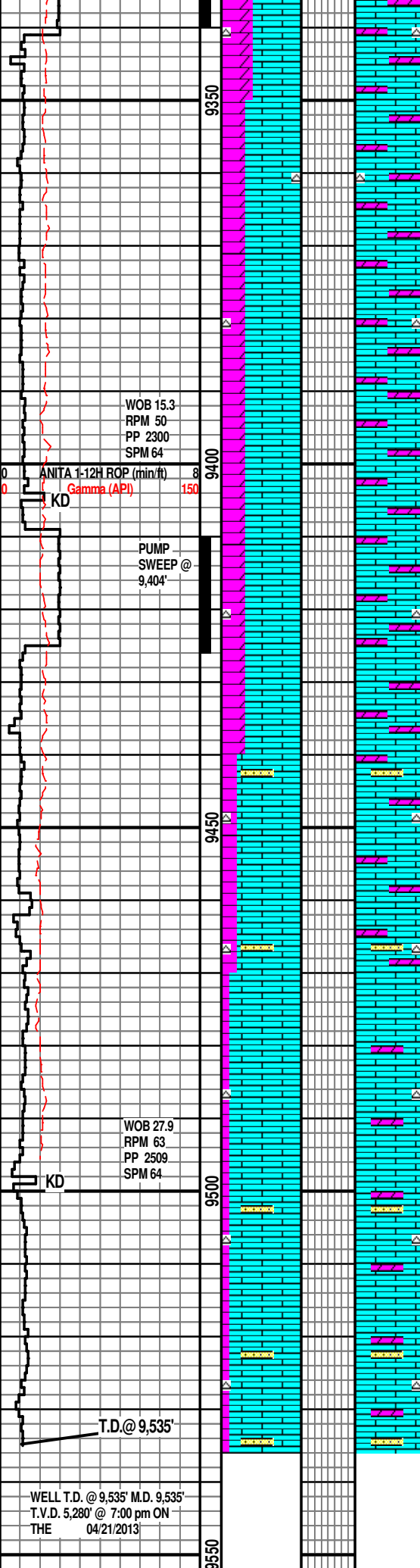
SURVEY: 9,290' MD 5,284' TVD  
INC. 87.2 / AZ. 178.4

LS: OFF WHT-WHT, OOL, FRM-HD, SME SL/MICRO/XLN, CRS ANG GRN, BLKY, TRS CHRT: WHT, TRANS/CLR, HD, VF-F-XLN, DOL: OFF WHT-WHT, MICRO-XLN, SL/SNDY, S/BLKY, MOD FRM-HD, WEAK CUT, THIN BLU-GREEN RING

SURVEY: 9,322' MD 5,286' TVD  
INC. 88.4 / AZ. 178.4

LS: OFF WHT-WHT, OOL, FRM-HD, SME SL/MICRO/XLN, CRS ANG GRN, BLKY,





TRS CHRT: WHT, TRANS/CLR, HD, VF-F-XLN, DOL: OFF WHT-WHT, MICRO-XLN, SL/SNDY, S/BLKY, MOD FRM-HD, WEAK CUT, THIN BLU-GREEN RING

SURVEY: 9,354' MD 5,287' TVD  
INC. 88.6 / AZ. 179.4

LS: OFF WHT-WHT, OOL, FRM-HD, SME SL/MICRO/XLN, CRS ANG GRN, BLKY, TRS CHRT: WHT, TRANS/CLR, HD, VF-F-XLN, DOL: OFF WHT-WHT, MICRO-XLN, SL/SNDY, S/BLKY, MOD FRM-HD, WEAK CUT, THIN BLU-GREEN RING

SURVEY: 9,385' MD 5,287' TVD  
INC. 89.9 / AZ. 179.2

LS: OFF WHT-WHT, OOL, FRM-HD, SME SL/MICRO/XLN, CRS ANG GRN, BLKY, TRS CHRT: WHT, TRANS/CLR, HD, VF-F-XLN, DOL: OFF WHT-WHT, MICRO-XLN, SL/SNDY, S/BLKY, MOD FRM-HD, WEAK CUT, THIN BLU-GREEN RING

SURVEY: 9,417' MD 5,286' TVD  
INC. 81.8 / AZ. 179.2

LS: OFF WHT-WHT, OOL, FRM-HD, SME SL/MICRO/XLN, BLKY, TRS CHRT: WHT, TRANS/CLR, HD, VF-F-XLN, DOL: OFF WHT-WHT, MICRO-XLN, SL/SNDY, S/BLKY, MOD FRM-HD, NO CUT, NO RING

SURVEY: 9,448' MD 5,285' TVD  
INC. 92.4 / AZ. 179.3

LS: OFF WHT-WHT, OOL, FRM-HD, SME SL/MICRO/XLN, BLKY, TRS CHRT: WHT, TRANS/CLR, HD, VF-F-XLN, V/SL TRS SS: MED/LT BRN, SME TAN, CONSOL, MED-CRSE GRN, WL-SRT DOL: OFF WHT-WHT, MICRO-XLN, SL/SNDY, S/BLKY, MOD FRM-HD, NO CUT, NO RING

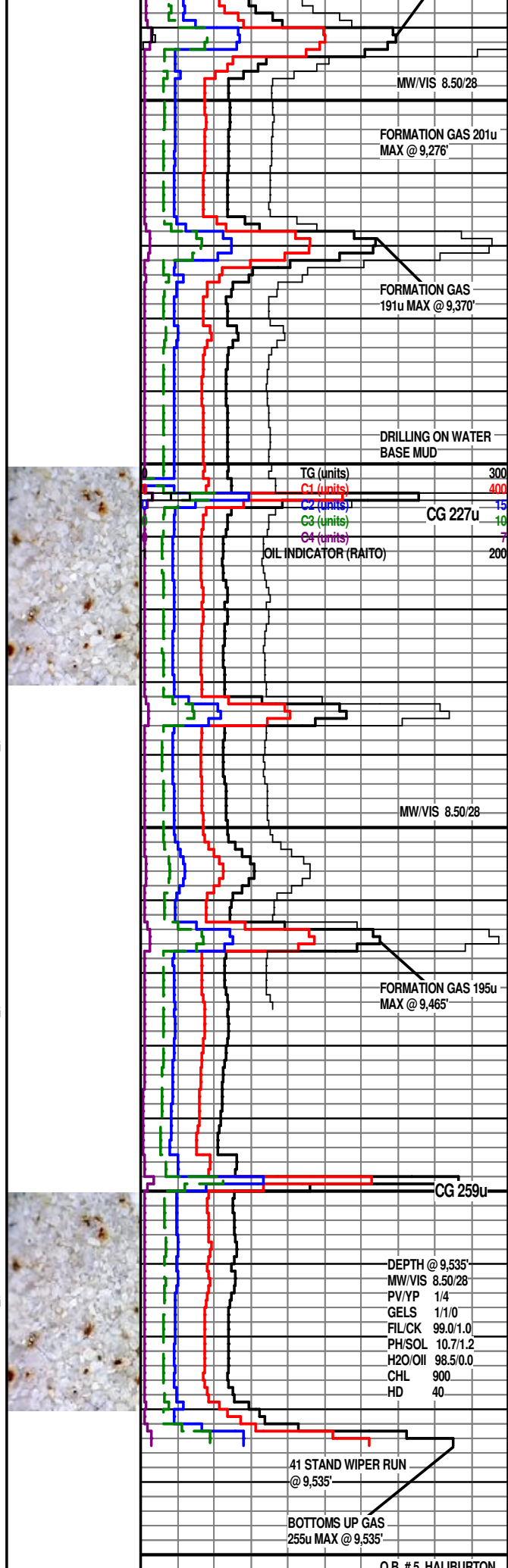
SURVEY: 9,484' MD 5,284' TVD  
INC. 93.1 / AZ. 179.0

LS: OFF WHT-WHT, OOL, FRM-HD, SME SL/MICRO/XLN, BLKY, TRS CHRT: WHT, TRANS/CLR, HD, VF-F-XLN, V/SL TRS SS: MED/LT BRN, SME TAN, CONSOL, MED-CRSE GRN, WL-SRT DOL: OFF WHT-WHT, MICRO-XLN, SL/SNDY, S/BLKY, MOD FRM-HD, NO CUT, NO RING

SURVEY: 9,535' MD 5,281' TVD  
INC. 93.1 / AZ. 179.0

WELL T.D. @ 9,535' M.D. 9,535'  
T.V.D. 5,280' @ 7:00 pm ON THE 04/21/2013

RAN OPEN HOLE LOGS



O.B. # 5, HALIBURTON  
TYPE - MM55DM PDC,  
SIZE - 6 1/2" IETS, 5 Y

ON 04/22/2013

RELEASED ON THE  
04/23/2013

00

3.22 0.123, 0.123 0.3 X  
12's, DEPTH IN @ 5,715'  
ft. Depth out @ 9,535'  
Drilled 3,820' in 78.75  
hrs. AVG. ROP = 48.51  
ft/ph.

Mud Log By  
Wayne & Betty Nix  
Geosearch-Empirica  
Logging, Inc.