



**Weatherford**

**COMPACT TRIPLE COMBO  
QUICKLOOK  
LOGS**

COMPANY EAST CHEYENNE GAS STORAGE LLC

WELL ECGS NO 6-14 WPD008-1

FIELD PEETZ WEST

PROVINCE/COUNTY LOGAN

COUNTRY/STATE USA/COLORADO

LOCATION NWNE 257' FNL & 1642' FEL

SEC	TWP	RGE	Other Services
6	11N	52W	

API Number WPD008-1

Permit Number 05-075-09403

Permanent Datum GL, Elevation 4544 feet

Log Measured From KB

Drilling Measured From KB

Date 30-SEP-2012

Run Number ONE

Depth Driller 5265.00 feet

Depth Logger 5267.00 feet

First Reading 5264.00 feet

Last Reading 4200.00 feet

Casing Driller 1217.00 feet

Casing Logger 1212.00 feet

Bit Size 8.750 inches

Hole Fluid Type WBM

Density / Viscosity 10.00 g/cc 38.00 CP

PH / Fluid Loss 10.00 6.40 ml/10min

Sample Source FLOWLINE

Rm @ Measured Temp 2.37 @ 93.5 ohm-m

Rmf @ Measured Temp 1.896 @ 93.5 ohm-m

Rmc @ Measured Temp 2.844 @ 93.5 ohm-m

Source Rmf / Rmc CALC CALC

Rm @ BHT 1.458 @154.0 ohm-m

Time Since Circulation 4 HOURS

Max Recorded Temp 154.00 deg F

Equipment Name COMPACT

Equipment / Base 13144 RK SPR

Recorded By B. ROSSER

Witnessed By J. ASHBY

Elevations:  
KB 4558.00  
DF 4557.00  
GL 4544.00

**BOREHOLE RECORD**

Last Edited: 30-SEP-2012 07:16

Bit Size  
inches

Depth From  
feet

Depth To  
feet

8.750

1212.00

5267.00

**CASING RECORD**

Type

Size  
inches

Depth From  
feet

Shoe Depth  
feet

Weight  
pounds/ft

SURFACE

9.625

0.00

1212.00

36.00

**REMARKS**

SOFTWARE VERSION 13.03.7779

TOOLS RUN: SHA, MCG, MDN, MPD, MIS-D, SKJ, MIS-E, SKJ, SHA, MIM, MIE, SKJ, MFE, MAI RUN IN COMBINATION.

HARDWARE: MPD: 8" PROFILE PLATE USED.  
MAI: TWO 1 INCH STANDOFFS USED.  
MFE: ONE 1 INCH STANDOFF USED.  
MDN: DUAL BOWSPRING USED.  
MIM: ONE NONMETALIC CENTRALIZING BASKET USED.  
MIE: ONE 1 INCH STANDOFF USED

2.65 G/CC DENSITY MATRIX USED TO CALCULATE POROSITY FROM TD TO BOTTOM OF NIOBRARA FORMATION (5267 FT TO 4655 FT).

2.71 G/CC DENSITY MATRIX USED TO CALCULATE POROSITY IN NIOBRARA FORMATION (4655 FT TO 4200 FT).

TIGHT PULLS, BOREHOLE SIZE AND RUGOSITY WILL AFFECT REPEATABILITY AND DATA QUALITY.

ALL INTERVALS LOGGED AND SCALED PER CUSTOMER'S REQUEST

ALL INTERVALS LOGGED AND CORRECTED FOR CUSTOMER REQUEST.

LAT, LONG: 40.96288 N, 103.21683 W

TOTAL HOLE VOLUME FROM TD TO SURFACE CASING =1770 CUBIC FEET

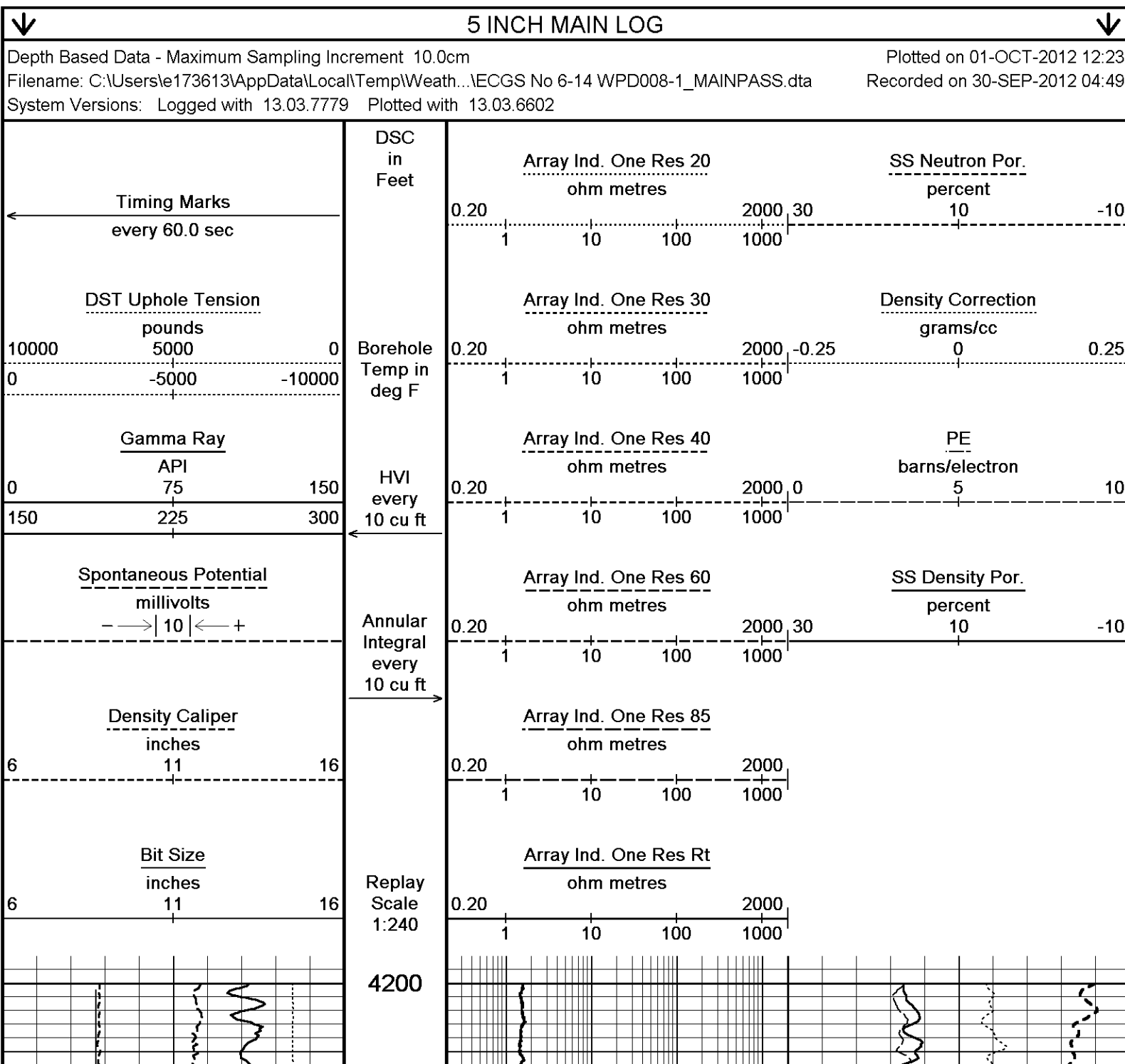
ANNULAR VOLUME WITH 7 INCH PRODUCTION CASING FROM TD TO SURFACE CASING = 700 CUBIC FEET

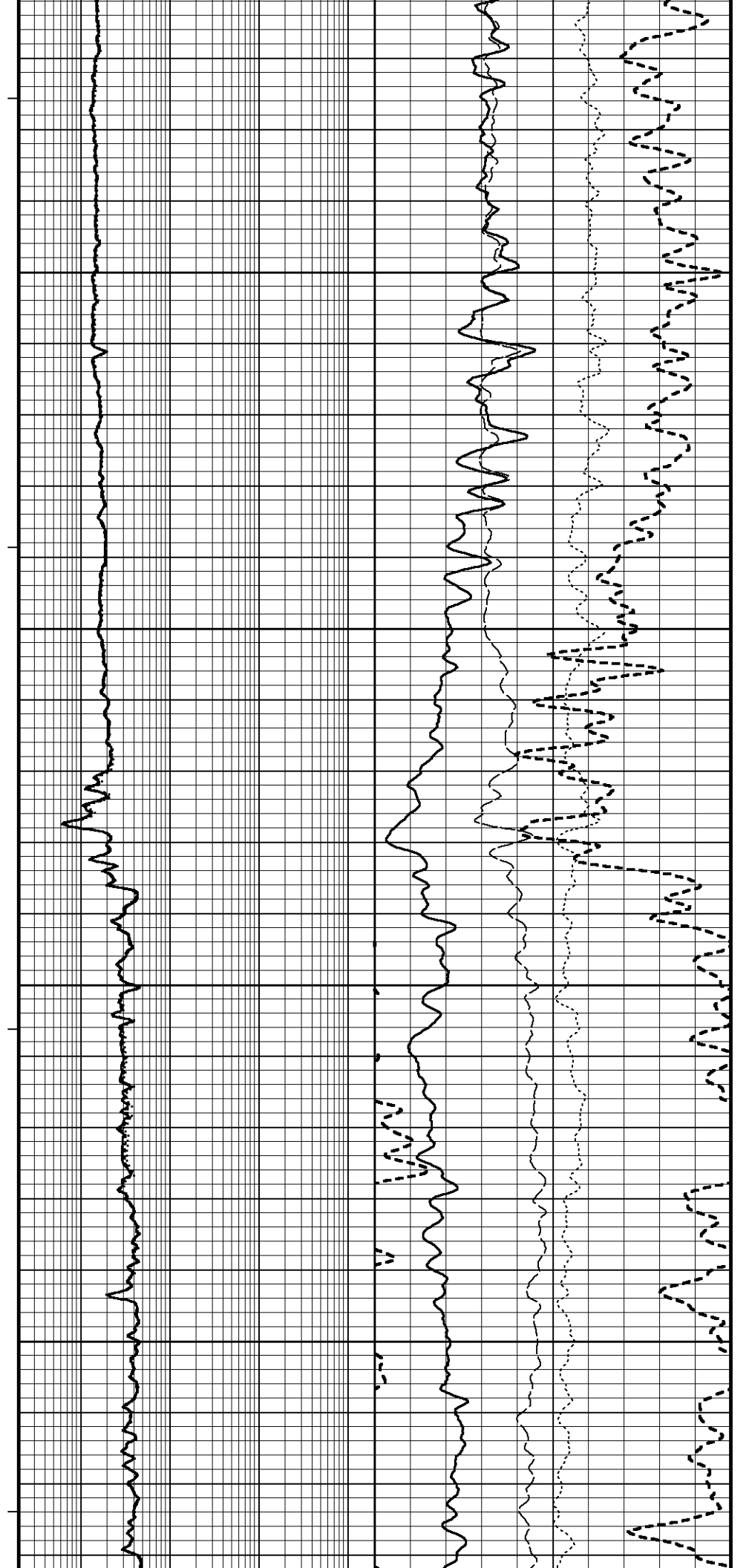
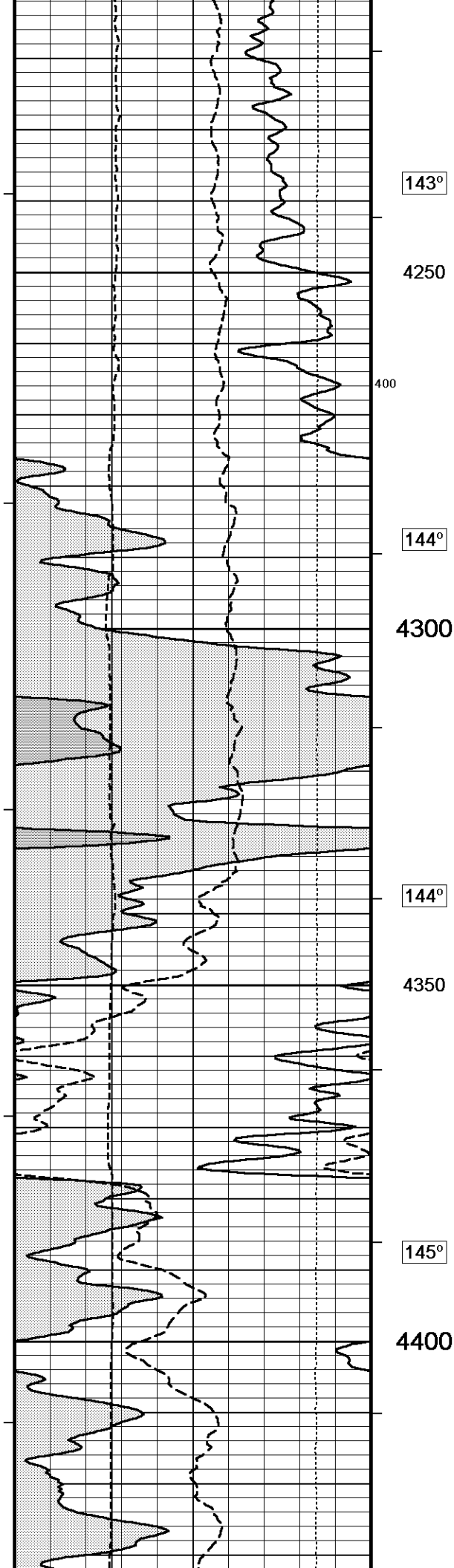
SERVICE ORDER: #3531928

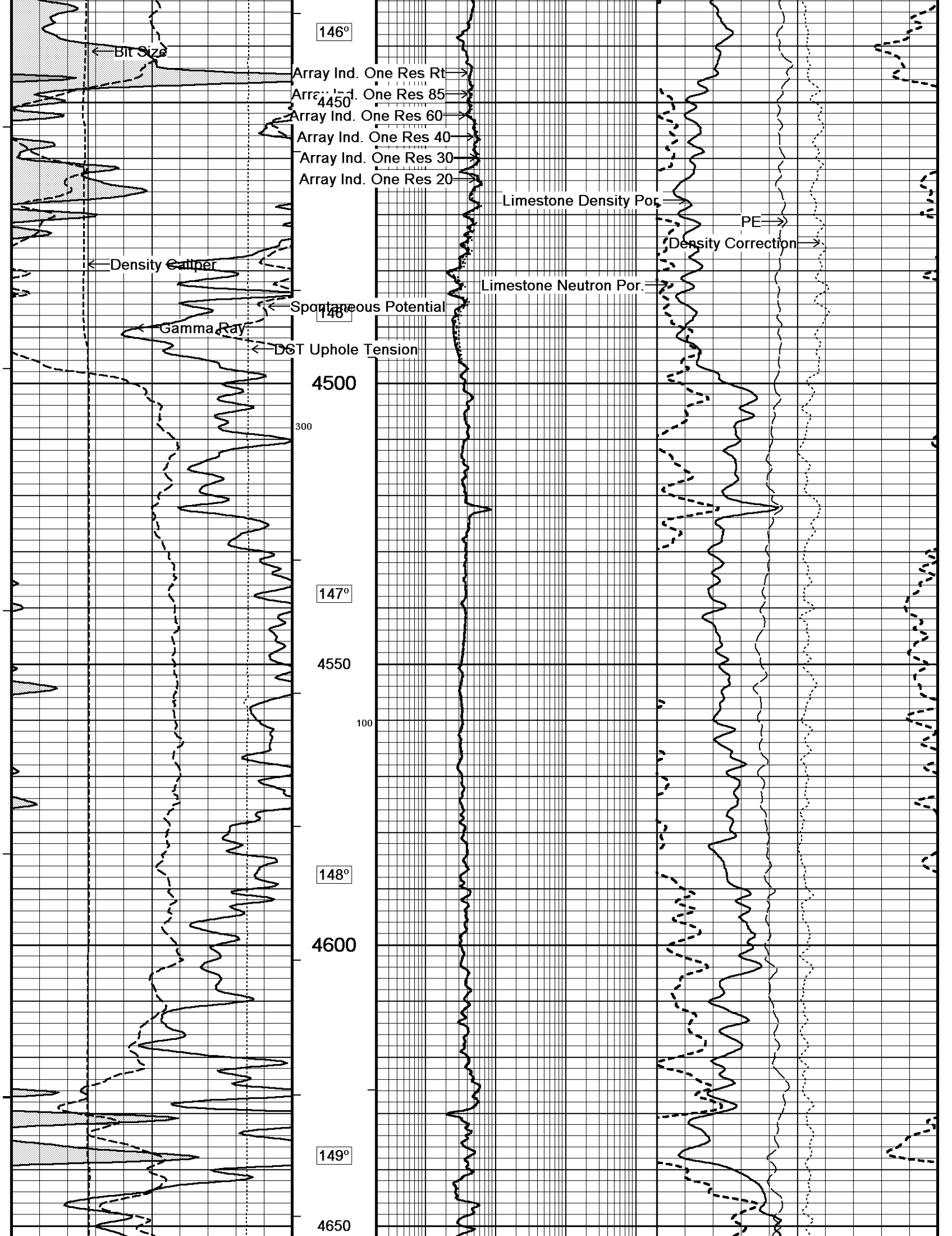
OPERATOR: D. SMITH  
S.ELMORE

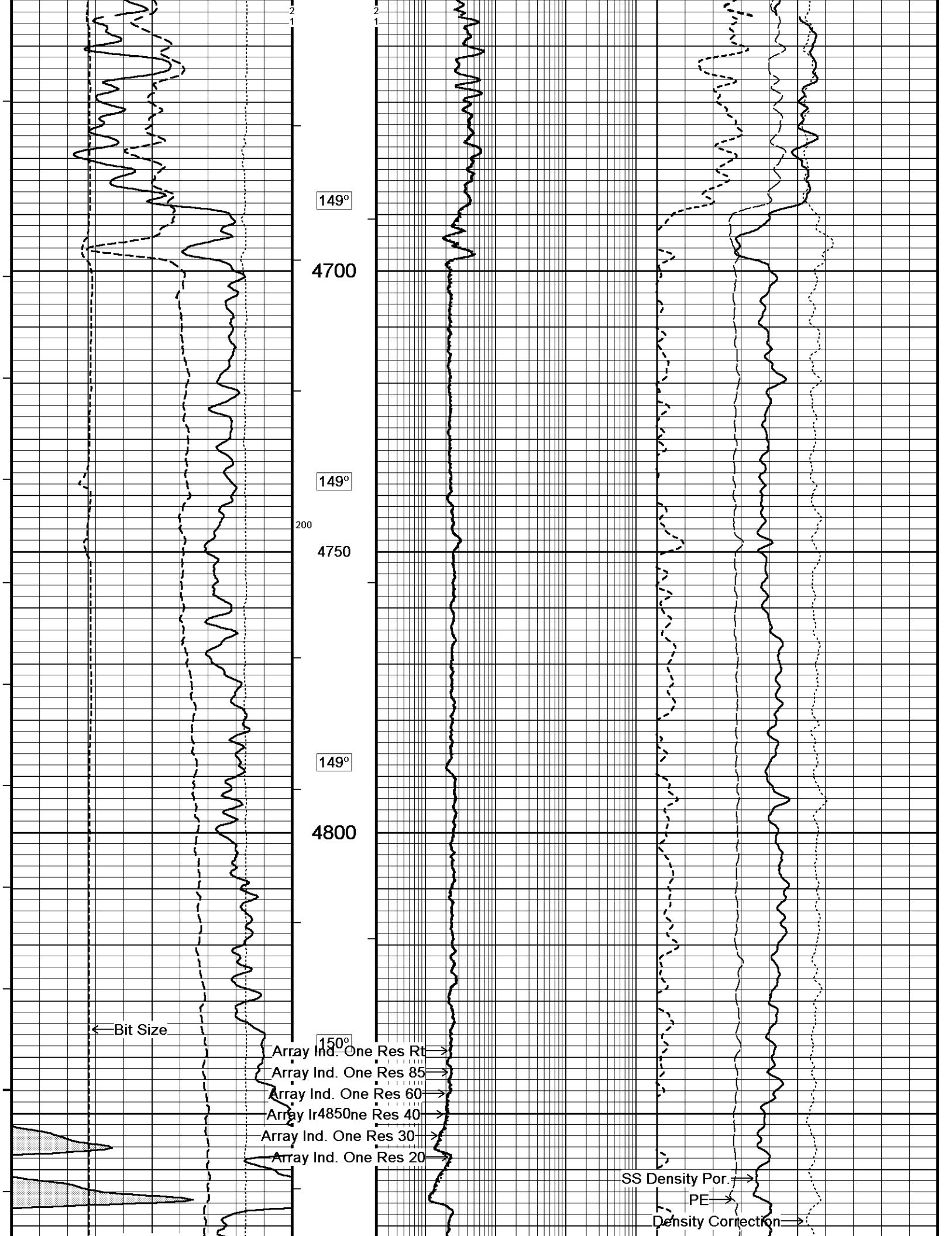
RIG: CADE 22

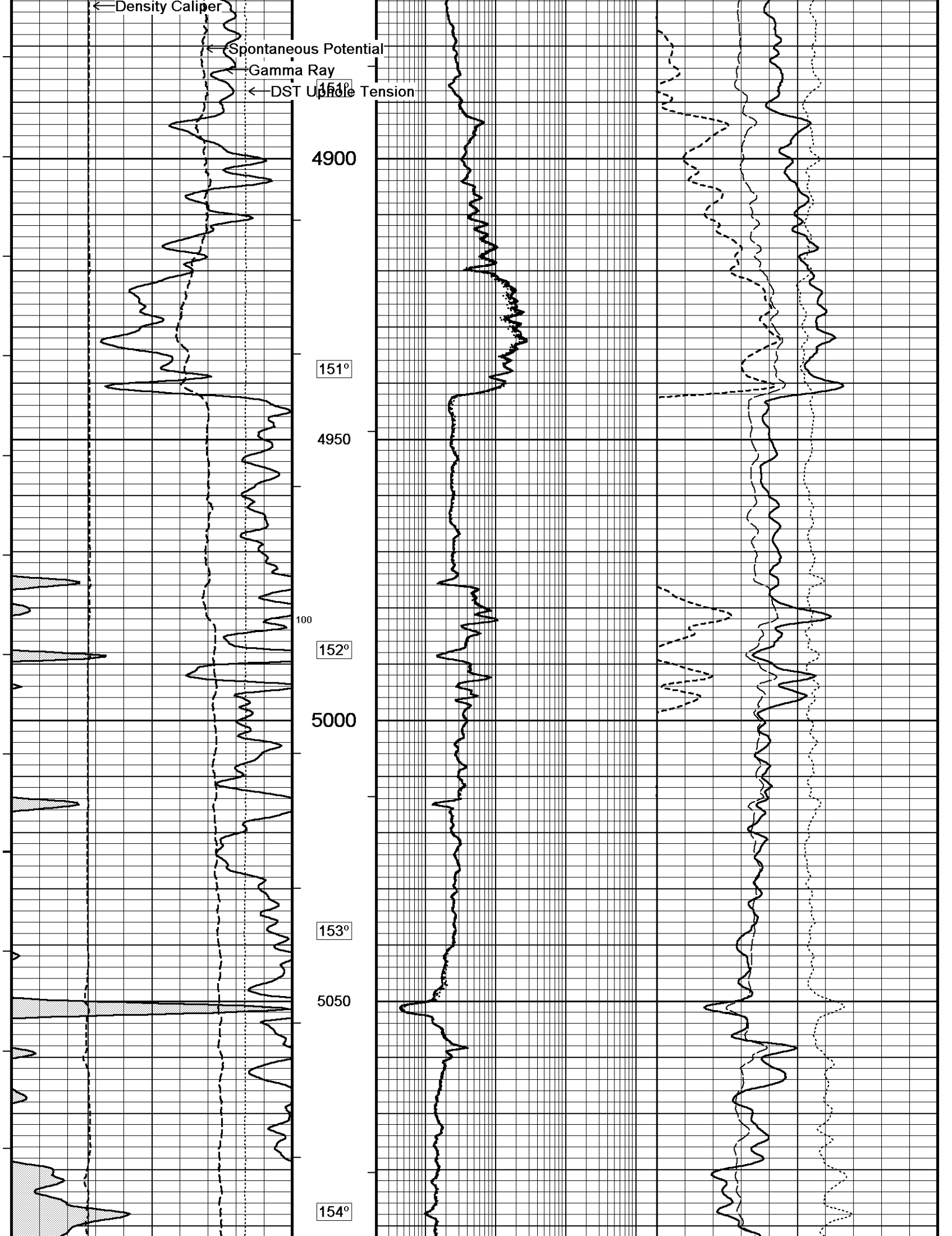
All interpretations are opinions based on inferences from electrical or other measurements and we cannot, and do not, guarantee the accuracy or correctness of any interpretations, and we shall not, except in the case of gross or wilful negligence on our part, be liable or responsible for any loss, costs, damages or expenses incurred or sustained by anyone resulting from any interpretation made by any of our officers, agents or employees. These interpretations are also subject to our general terms and conditions in our price schedule.

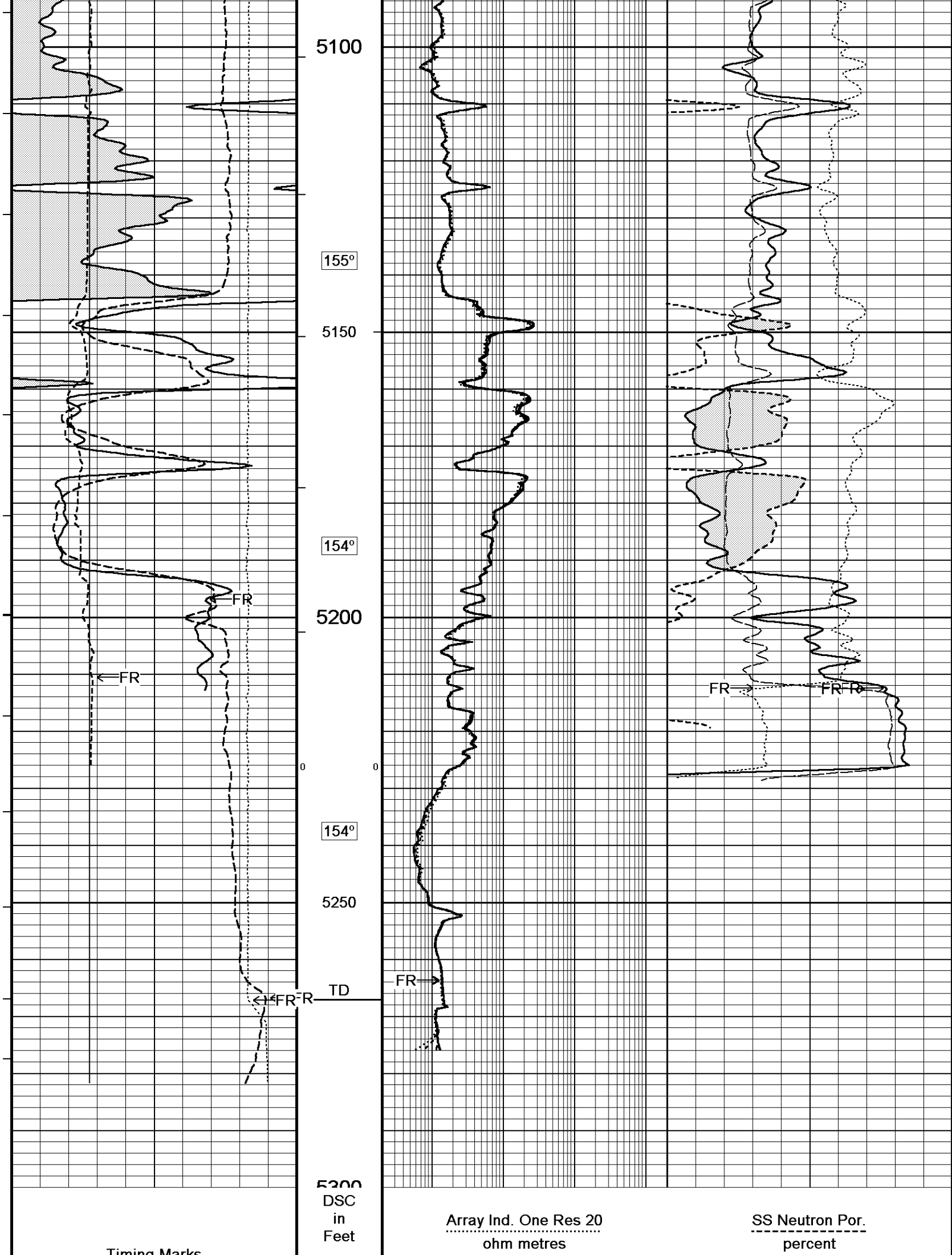


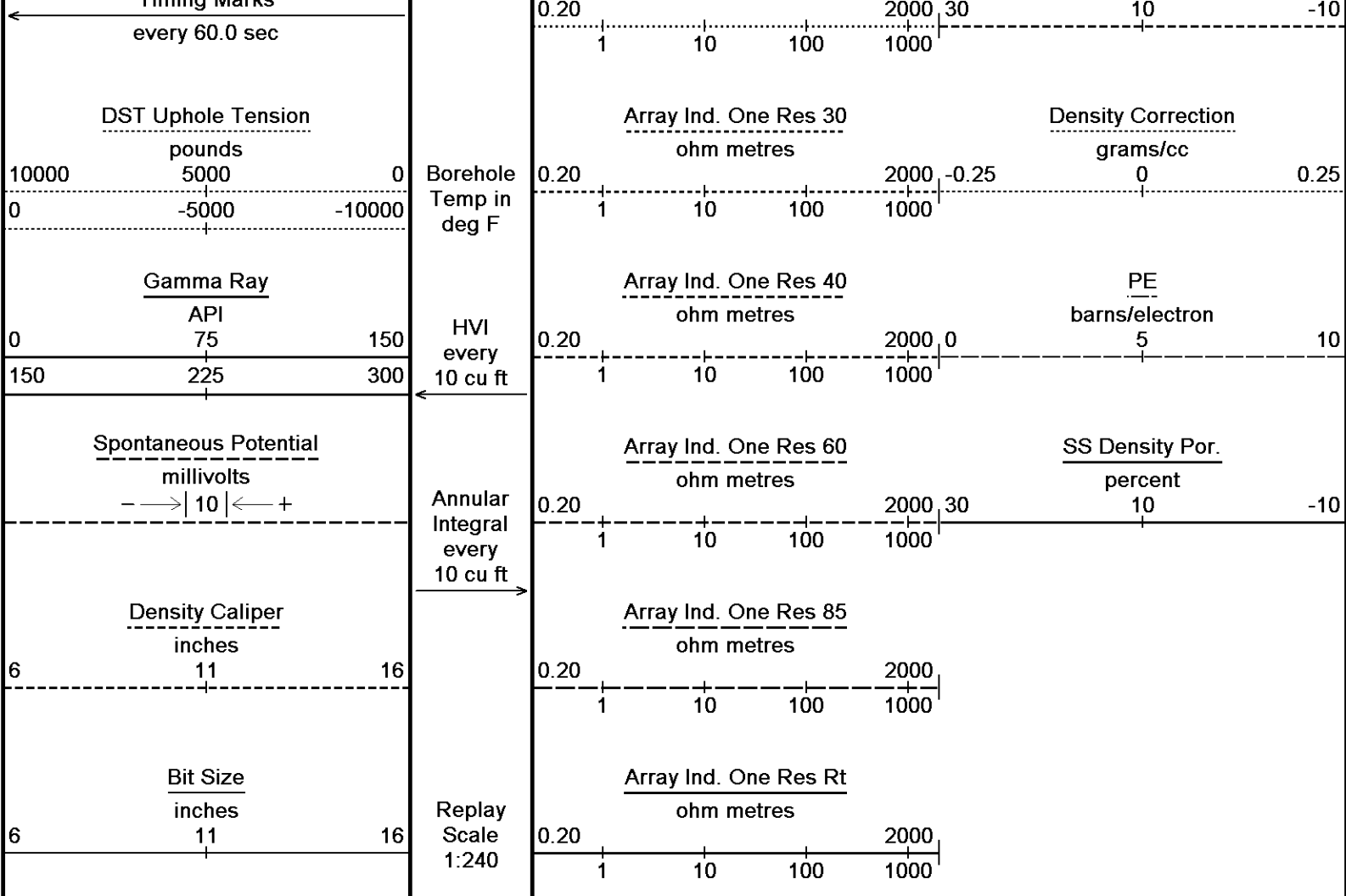












Depth Based Data - Maximum Sampling Increment 10.0cm  
Filename: C:\Users\le173613\AppData\Local\Temp\Weath...\IECGS No 6-14 WPD008-1\_MAINPASS.dta  
System Versions: Logged with 13.03.7779 Plotted with 13.03.6602

5 INCH MAIN LOG

BEFORE SURVEY CALIBRATION  
C:\Users\le173613\AppData\Local\Temp\Weatherford PreView\0\IECGS No 6-14 WPD008-1\_MAINPASS.dta

Down-hole Tension Calibration All 000

Reading No	Measured	0	Field Calibration on 24-OCT-2010 03:34
1	15659.85	0.00	
2	15734.68	370.00	

General Constants All 000

General Parameters		
Mud Resistivity	2.370	ohm-metres
Mud Resistivity Temperature	93.500	degrees F
Water Level	0.000	feet
Density/Neutron Processing	Wet Hole	
Hole/Annular Volume and Differential Caliper Parameters		
HVOL Method	Single Caliper	
HVOL Caliper 1	Density Caliper	
HVOL Caliper 2	N/A	
Annular Volume Diameter	7.000	inches
Caliper for Differential Caliper	Density Caliper	
Rwa Parameters		
Porosity used	Base Density Porosity	
Resistivity used	Array Ind. One Res Rt	
RWA Constant A	0.610	



## Down-hole Tension Calibration SMS 0

Field Calibration on 30-SEP-2012 03:26

Reading No	Measured	Calibrated (lbs)
1	15589.90	0.00
2	16735.70	480.00

## Gamma Calibration MCG-D.K 483

Field Calibration on 29-SEP-2012 18:20

	Measured	Calibrated (API)
Background	74	50
Calibrator (Gross)	842	569
Calibrator (Net)	768	519

## Gamma Constants MCG-D.K 483

Last Edited on 30-SEP-2012,01:50

Gamma Calibrator Number	GRCC119	
Mud Density	1.00	gm/cc
Caliper Source for Processing	Density Caliper	
Tool Position	Eccentred	
Concentration of KCl	0.00	kppm

## SP Calibration MCG-D.K 483

Field Calibration on 23-SEP-2012,10:15

	Measured	Calibrated (mV)
Reference 1	100.0	100.0
Reference 2	-100.0	-100.0

## High Resolution Temperature Calibration MCG-D.K 483

Field Calibration on 30-SEP-2012,04:09

	Measured	Calibrated(Deg F)
Lower	50.00	50.00
Upper	75.00	75.00

## High Resolution Temperature Constants MCG-D.K 483

Last Edited on 30-SEP-2012,04:08

Pre-filter Length	11
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## Neutron Calibration MDN-B.J 372

Base Calibration on 11-SEP-2012 10:37

Field Check on 29-SEP-2012 18:42

Base Calibration					
		Measured		Calibrated (cps)	
		Near	Far	Near	Far
		2935	90	3714	110
Ratio		32.738		33.764	
Field Calibrator at Base					
				Calibrated (cps)	
				2265	3365
Ratio				0.673	
Field Check					
				Calibrated (cps)	
				2313	3388
Ratio				0.683	

## Neutron Constants MDN-B.J 372

Last Edited on 30-SEP-2012,01:50

Neutron Source Id	P31115B	
Neutron Jig Number	NJ5299	
Epithermal Neutron	No	
Caliper Source for Processing	Density Caliper	
Stand-off	0.00	inches
Mud Density	1.00	gm/cc
Limestone Sigma	7.10	cu
Sandstone Sigma	7.00	cu
Dolomite Sigma	4.70	cu
Formation Pressure Source	None	
Formation Pressure	N/A	kpsi
Temperature Source	MCG External Temperature	
Temperature	N/A	degrees F
Mud Salinity	0.00	kppm
Salinity Correction	Not Applied	
Formation Fluid Salinity Source	None	
Formation Fluid Salinity	N/A	kppm

Barite Mud Correction		Not Applied			
Navigation Constants MIE-A.J 241				Last Edited on 30-SEP-2012,01:56	
Magnetic Declination		0.00	degrees	East	
Magnetometer Parameters MIE-A.J 241					
Date Of Last Magnetometer Calibration		14-FEB-2012,20:54			
Slope	X Magnetometer	-1.000000	Y Magnetometer	Z Magnetometer	
Offset		0.001649	-0.018156	-0.999264	
Magnetometer Constants MIE-A.J 241					
Magnetometer Calibrator Number		0			
Accelerometer Parameters MIE-A.J 241					
Date Of Last Accelerometer Calibration		14-FEB-2012,19:26			
Slope	X Accelerometer	-1.107927	Y Accelerometer	Z Accelerometer	
Offset		-0.004165	0.008747	-1.089726	
Accelerometer Constants MIE-A.J 241					
Accelerometer Calibrator Number		000			
Accelerometer Temperature Characterisation					
X Accelerometer					
Serial Number	922				
Calibration Date	14-Nov-2010				
	B0	B1	B2	B3	
Bias(g)	0.00000e+000	1.98626e-005	-2.34772e-009	1.61466e-010	
	SF0	SF1	SF2	SF3	
Scale Factor(mA/g)	3.00000e+000	2.59314e-004	4.64734e-007	5.67183e-010	
Y Accelerometer					
Serial Number	970				
Calibration Date	19-Jan-2011				
	B0	B1	B2	B3	
Bias(g)	0.00000e+000	-4.23329e-006	-2.08894e-008	1.84400e-010	
	SF0	SF1	SF2	SF3	
Scale Factor(mA/g)	3.00000e+000	2.61643e-004	3.45088e-007	8.15526e-010	
Z Accelerometer					
Serial Number	1076				
Calibration Date	05-May-2011				
	B0	B1	B2	B3	
Bias(g)	0.00000e+000	-5.18602e-006	1.72429e-008	7.30746e-011	
	SF0	SF1	SF2	SF3	
Scale Factor(mA/g)	3.00000e+000	2.93462e-004	2.41183e-007	1.26400e-009	
Caliper Calibration MIE-A.J 241				Base Calibration on 28-SEP-2012 11:04	
				Field Calibration on 28-SEP-2012 11:06	
Base Calibration					
Reading No	Pads 1-5 Meas.	Pads 3-7 Meas.	Calibrator Size (in)		
1	25529	28507	5.97		
2	35884	38819	7.96		
3	45829	48887	9.87		
4	57640	60711	11.92		
5	0	0	0.00		
Reading No	Pad 2 Meas.	Pad 4 Meas.	Pad 6 Meas.	Pad 8 Meas.	Calibrator Size (in)
1	24865	25887	25754	25884	5.97
2	34293	34905	33925	34009	7.96
3	42506	43163	42193	42341	9.87
4	52787	53107	51835	52240	11.92
5	0	0	0	0	0.00
Field Calibration					
	Measured	Measured	Actual		
	Pads 1-5 Caliper(in)	Pads 3-7 Caliper(in)	Caliper(in)		

7.94		7.72		7.96	
Measured Pad 2 Caliper(in) 3.89	Measured Pad 4 Caliper(in) 3.89	Measured Pad 6 Caliper(in) 4.06	Measured Pad 8 Caliper(in) 4.06	Actual Caliper(in) 7.96	
Caliper Constants MIE-A.J 241				Last Edited on 09-JUN-2012,12:33	
Caliper Difference for BRKT		0.120	inches		
Imager Pad Check MIE-A.J 241				Field Check on	
Pad 1	Pad Not Tested	Pad 5	Pad Not Tested		
Pad 2	Pad Not Tested	Pad 6	Pad Not Tested		
Pad 3	Pad Not Tested	Pad 7	Pad Not Tested		
Pad 4	Pad Not Tested	Pad 8	Pad Not Tested		
Compact Micro Imager Constants MIE-A.J 241				Last Edited on 30-SEP-2012,01:56	
Sonde Configuration		Imager Mode	degrees		
Arm-Pad Kit		Normal Pads (12.25 in)			
Centre Pad 1 Rotational Offset		0.00			
Image/Borehole Ovality Reference		Azimuth of Pad 1	degrees		
Non Active Buttons		Omit	feet		
Search Angle		0.00	feet		
Correlation Interval		3.28	mAmp		
Correlation Step		1.64	mAmp		
Current Offset		0.0000			
Squasher Start		0.0500			
Image Processing		Enabled			
FE Calibration MFE-A.A 76				Base Calibration on 10-SEP-2012 11:36 Field Check on 29-SEP-2012 18:21	
Base Calibration		Measured	Calibrated (ohm-m)		
Reference 1		0.0	0.0		
Reference 2		964.4	126.8		
Base Check		279.9			
Field Check		280.1			
FE Constants MFE-A.A 76				Last Edited on 30-SEP-2012,01:57	
Running Mode		No Sleeve			
MFE K Factor		0.1268			
Caliper Source for FE correction		Density Caliper			
Caliper Value for FE correction		N/A inches			
Rm Source for FE correction		Temperature Corr			
Temp. for Rm Corr.		MCG External Temperature			
Stand-off		1.0 inches			
High Resolution Temperature Calibration MAI-B.A 219				Field Calibration on 10-AUG-2011,00:10	
		Measured	Calibrated(Deg F)		
Lower		50.00	50.00		
Upper		75.00	75.00		
High Resolution Temperature Constants MAI-B.A 219				Last Edited on 30-SEP-2012,04:08	
Pre-filter Length		11			
Induction Calibration MAI-B.A 219				Base Calibration on 08-MAY-2012,15:56 Field Check on 29-SEP-2012 18:14	
Base Calibration					
Test Loop Calibration		Measured		Calibrated (mmho/m)	
Channel	Low	High	Low	High	
1	17.4	478.1	9.3	966.2	
2	5.8	380.3	7.6	821.4	
3	3.5	258.5	5.2	566.0	
4	1.9	136.0	2.6	279.2	
Array Temperature		77.2	Deg F		

Channel	Base Check (mmho/m)		Field Check (mmho/m)	
	Low	High	Low	High
1	0.0	0.0	12.4	3792.3
2	0.0	0.0	31.0	3535.9
3	0.0	0.0	28.7	3054.7
4	0.0	0.0	19.3	2027.5
Deep	0.0	0.0	16.5	1947.7
Medium	0.0	0.0	42.8	4086.8
Shallow	0.0	0.0	47.7	5281.8
Array Temperature		0.0	67.3	Deg F

## Induction Constants MAI-B.A 219

Last Edited on 30-SEP-2012,02:04

Induction Model		RtAP-WBM	
Caliper for Borehole Corr.		Density Caliper	
Hole Size for Borehole Correction		N/A	inches
Tool Centred		No	
Stand-off Type		Fins	
Stand-off		1.00	inches
Number of Fins on Stand-off		6.0000	
Stand-off Fin Angle		60.00	degrees
Stand-off Fin Width		0.5000	inches
Borehole Corr. Rm Source		Temperature Corr	
Temp. for Rm Corr.	MCG	External Temperature	
Squasher Start		0.0020	mhos/metre
Squasher Offset		N/A	mhos/metre
Borehole Normalisation			
DRM1	0.0000	DRC1	0.0000
DRM2	0.0000	DRC2	0.0000
MRM1	0.0000	MRC1	0.0000
MRM2	0.0000	MRC2	0.0000
SRM1	0.0000	SRC1	0.0000
SRM2	0.0000	SRC2	0.0000

## Calibration Site Corrections

Channel 1	0.00	mmhos/metre
Channel 2	0.00	mmhos/metre
Channel 3	0.00	mmhos/metre
Channel 4	0.00	mmhos/metre

## Apparent Porosity and Water Saturation Constants

Archie Constant (A)	1.00	
Cementation Exponent (M)	2.00	
Saturation Exponent (N)	2.00	
Saturation of Water for Apor	100.00	percent
Resistivity of Water for Apor and Sw	0.05	ohm-m
Resistivity of Mud Filtrate for Sw	0.00	ohm-m
Source for Rt	0.00	
Source for Rxo	0.00	

## Caliper Calibration MPD-C.J 378

Base Calibration on 29-SEP-2012 18:35

Field Calibration on 29-SEP-2012 18:36

Base Calibration		
Reading No	Measured	Calibrator Size (in)
1	14193	3.99
2	22768	5.97
3	31248	7.96
4	39297	9.87
5	48452	11.92
6	N/A	N/A

## Field Calibration

Measured Caliper (in)	Actual Caliper (in)
7.91	7.96

## Photo Density Calibration MPD-C.J 378

Base Calibration on 27-SEP-2012 12:49

Field Check on 29-SEP-2012 18:28

Density Calibration		
Base Calibration	Measured	Calibrated (sdu)
	Near	Far
	Near	Far

	Near	Far	Near	Far
Reference 1	39385	12332	52994	19128
Reference 2	18690	2207	25185	2558

Field Check at Base

1201.6 1277.5

Field Check

1202.3 1288.1

PE Calibration

Base Calibration

Measured

Calibrated

WS

WH

Ratio

Ratio

Background

219

1074

Reference 1

13507

39225

0.348

0.309

Reference 2

5341

18558

0.293

0.274

Field Check at Base

219.0

1074.2

Field Check

219.4

1076.2

Density Constants MPD-C.J 378

Last Edited on 30-SEP-2012,01:52

Density Source Id

P15771B

Nylon Calibrator Number

DNC-D-527

Aluminium Calibrator Number

DAC-D-527

Density Shoe Profile

8 inch

Caliper Source for Processing

Density Caliper

PE Correction to Density

Not Applied

Mud Density

1.20

gm/cc

Mud Density Z/A Multiplier

1.11

Mud Filtrate Density

1.00

gm/cc

Dry Hole Mud Filtrate Density

1.00

gm/cc

DNCT

0.00

gm/cc

CRCT

0.00

gm/cc

Density Z/A Correction

Hybrid

Matrix Density (gm/cc)

Depth (ft)

2.68

0.00

0.00

0.00

0.00

0.00

0.00

0.00

0.00

0.00

0.00

0.00

0.00

0.00

0.00

0.00

## DOWNHOLE EQUIPMENT

C:\Users\le173613\AppData\Local\Temp\Weatherford PreView\0\ECGS No 6-14 WPD008-1\_MAINPASS.dta

3/8" Triple Cone Cable Head (MCB C A)

MCB-C.A 5 LG: 1.58 ft WT: 15.4 lb OD: 2.24 in

SHA-H Compact Swivel Head Adaptor

SHA-H 142 LG: 2.30 ft WT: 22.0 lb OD: 2.24 in

Compact Comms Gamma

MCG-D.K 483 LG: 8.70 ft WT: 63.9 lb OD: 2.24 in

Compact Neutron

MDN-B.J 372 LG: 5.04 ft WT: 50.7 lb OD: 2.24 in

Compact Density/Caliper

MPD-C.J 378 LG: 9.59 ft WT: 90.4 lb OD: 2.45 in



70.14 ft

GRGC - Gamma Ray

63.68 ft

NPRS - Sandstone Neutron Por.

63.68 ft

NPRL - Limestone Neutron Por.

56.44 ft

CLDC - Density Caliper

54.51 ft

DPRS - Sandstone Density Por.

54.51 ft

DPRL - Limestone Density Por.

MIS-A.A Compact Inline Bowspring sub  
MIS-A.A 70 LG: 5.70 ft WT: 33.1 lb OD: 2.24 in

SKJ-D.A Compact Knuckle Joint  
SKJ-D.A 112 LG: 2.17 ft WT: 24.3 lb OD: 2.24 in

MIS-E.A Compact Inline Standoff sub  
MIS-E.A 334 LG: 2.14 ft WT: 15.4 lb OD: 2.24 in

SKJ-E.A Compact Knuckle Joint  
SKJ-E.A 143 LG: 2.17 ft WT: 24.3 lb OD: 2.24 in

SHA-J.B Compact Swivel Head Adaptor  
SHA-J.B 574 LG: 2.30 ft WT: 22.0 lb OD: 2.24 in

Compact MMI Memory Section  
MIM-A.J 241 LG: 4.65 ft WT: 26.5 lb OD: 2.24 in

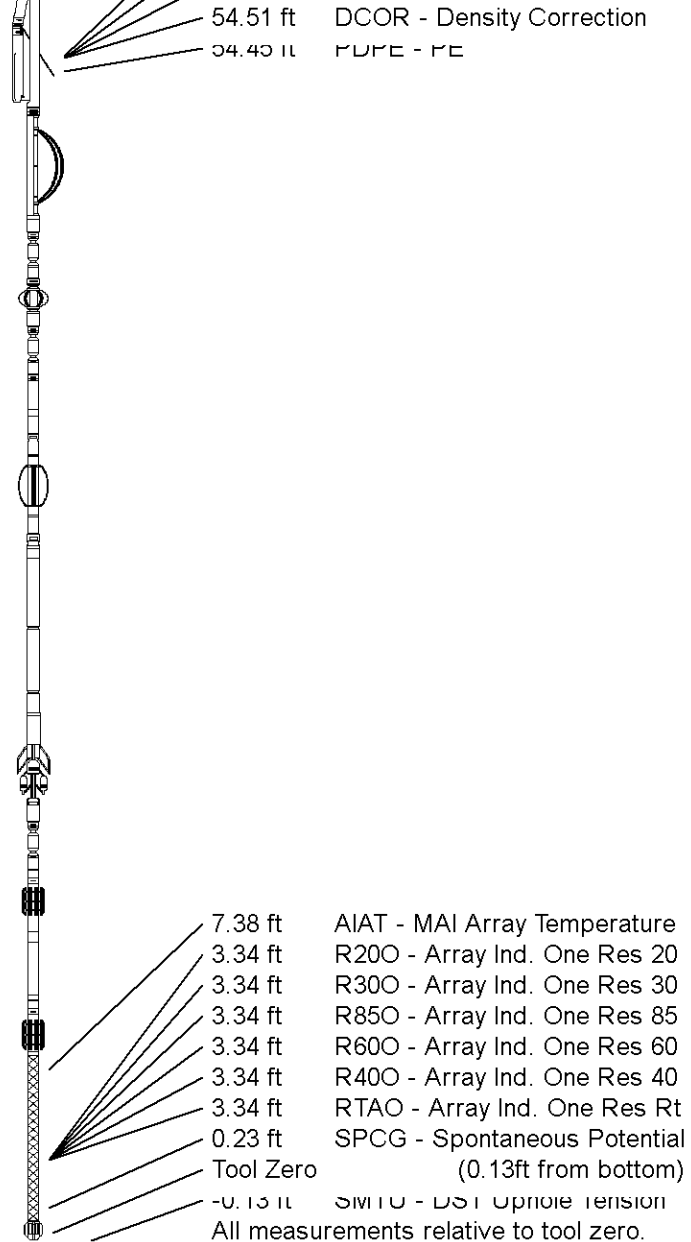
Compact MMI Electrode Section  
MIE-A.J 241 LG: 13.96 ft WT: 99.2 lb OD: 4.09 in

SKJ-E.B Compact Knuckle Joint  
SKJ-E.B 583 LG: 2.17 ft WT: 24.3 lb OD: 2.24 in

Compact Focussed Electric  
MFE-A.A 76 LG: 6.05 ft WT: 48.5 lb OD: 2.24 in

Compact Induction  
MAI-B.A 219 LG: 10.81 ft WT: 48.5 lb OD: 2.24 in

Total Length: 79.30 ft Weight: 608.5 lb



COMPANY	EAST CHEYENNE GAS STORAGE LLC		
WELL	ECGS NO 6-14 WPD008-1		
FIELD	PEETZ WEST		
PROVINCE/COUNTY	LOGAN		
COUNTRY/STATE	USA/COLORADO		

Elevation Kelly Bushing	4558.00	feet	First Reading	5264.00	feet
Elevation Drill Floor	4557.00	feet	Depth Driller	5265.00	feet
Elevation Ground Level	4544.00	feet	Depth Logger	5267.00	feet



**Weatherford®**

COMPACT TRIPLE COMBO  
QUICKLOOK  
LOGS

