



Weatherford

ARRAY INDUCTION
SHALLOW FOCUSED
ELECTRIC LOG

COMPANY	CMX, INC.		
WELL	KOZISEK #1-8		
FIELD	STOLTENBERG		
PROVINCE/COUNTY	ELLSWORTH		
COUNTRY/STATE	U.S.A. / KANSAS		
LOCATION	990' FSL & 1980' FEL		
SEC 8	TWP 16S	RGE 10W	Other Services
Latitude	MDN/MPD		
Longitude	MML		
API Number	15-053-21344		
Permanent Datum GL, Elevation	1838 feet		
Log Measured From	KB		
Drilling Measured From	KB @ 8 FEET		
Date	11-JAN-2016	Elevations: KB 1846.00 DF 1844.00 GL 1838.00	
Run Number	ONE		
Service Order	4558-139737246		
Depth Driller	3400.00	feet	
Depth Logger	3396.00	feet	
First Reading	3393.00	feet	
Last Reading	348.00	feet	
Casing Driller	347.00	feet	
Casing Logger	348.00	feet	
Bit Size	7.875	inches	
Hole Fluid Type	CHEMICAL		
Density / Viscosity	9.00 lb/USg	43.00 CP	
PH / Fluid Loss	9.00	9.80 ml/30Min	
Sample Source	FLOWLINE		
Rm @ Measured Temp	0.83 @ 75.0	ohm-m	
Rmf @ Measured Temp	0.66 @ 75.0	ohm-m	
Rmc @ Measured Temp	1.0 @ 75.0	ohm-m	
Source Rmf / Rmc	CALC	CALC	
Rm @ BHT	0.69 @ 90.0	ohm-m	
Time Since Circulation	4 HOURS		
Max Recorded Temp	90.00	deg F	
Equipment / Base	13096	OKC	
Recorded By	ADAM SILL		
Witnessed By	KEN LeBLANC		

BOREHOLE RECORD				Last Edited: 11-JAN-2016 22:43
Bit Size inches	Depth From feet		Depth To feet	
7.875	347.00		3400.00	
CASING RECORD				
Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft
SURFACE	8.625	0.00	347.00	24.00

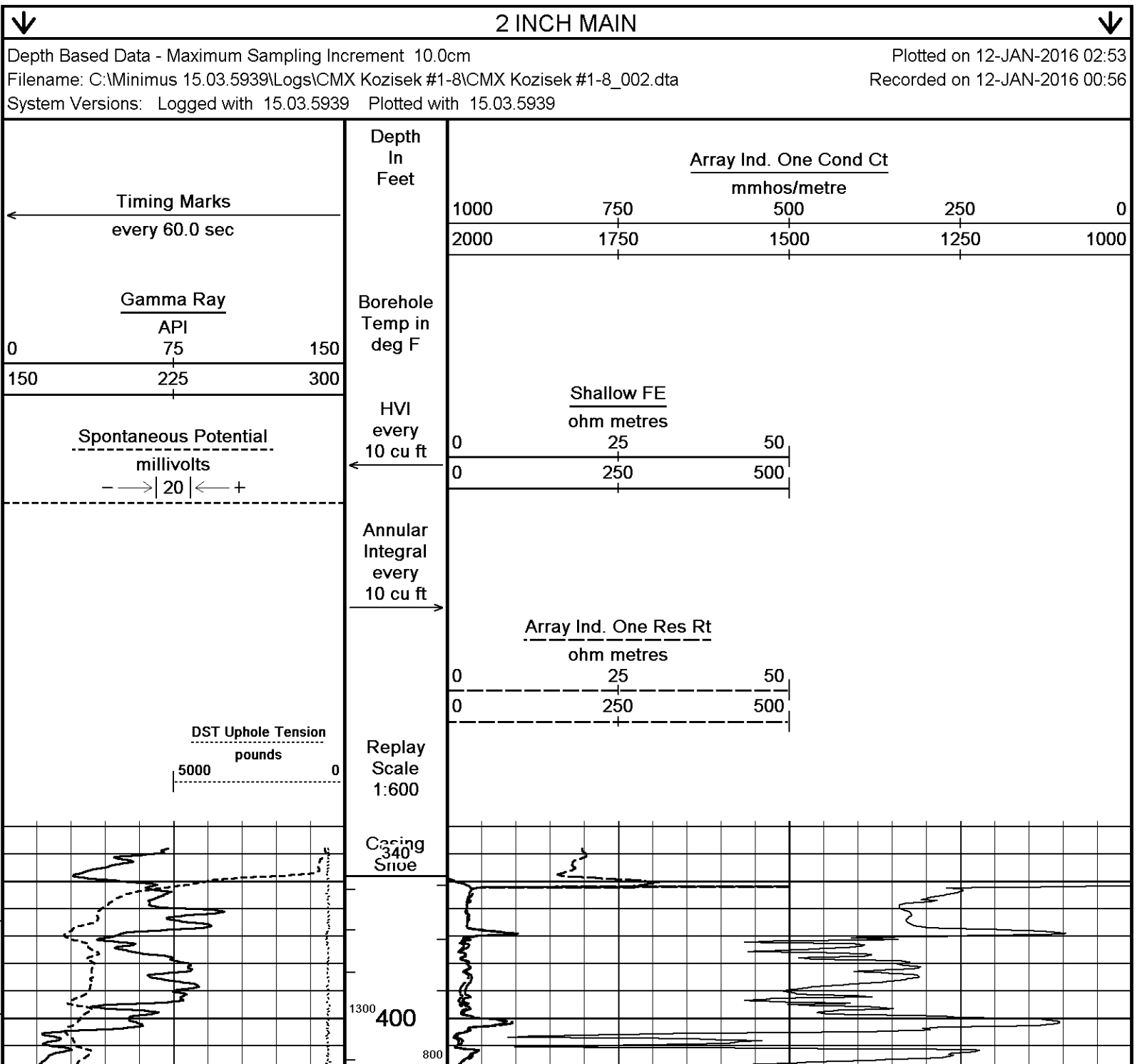
REMARKS
- SOFTWARE ISSUE: WLS 15.03.5939.
- RUN ONE: MCG, MML, MDN, MPD, MFE, MAI RUN IN COMBINATION. - HARDWARE: DUAL BOWSPRING USED ON MDN. 0.5 INCH STANDOFF USED ON MFE. 0.5 INCH STANDOFF USED ON MAI.
- 2.71 G/CC LIMESTONE DENSITY MATRIX USED TO CALCULATE POROSITY.
- BOREHOLE RUGOSITY, TIGHT PULLS, AND WASHOUTS WILL AFFECT DATA QUALITY.
- ALL INTERVALS LOGGED AND SCALED PER CUSTOMER'S REQUEST.
- TOTAL HOLE VOLUME FROM TD TO SURFACE CASING: 1332 CU.FT.
- ANNULAR HOLE VOLUME WITH 5.5 INCH PRODUCTION CASING FROM TD TO 2300 FEET: 207 CU.FT.
- RIG: DUKE #2

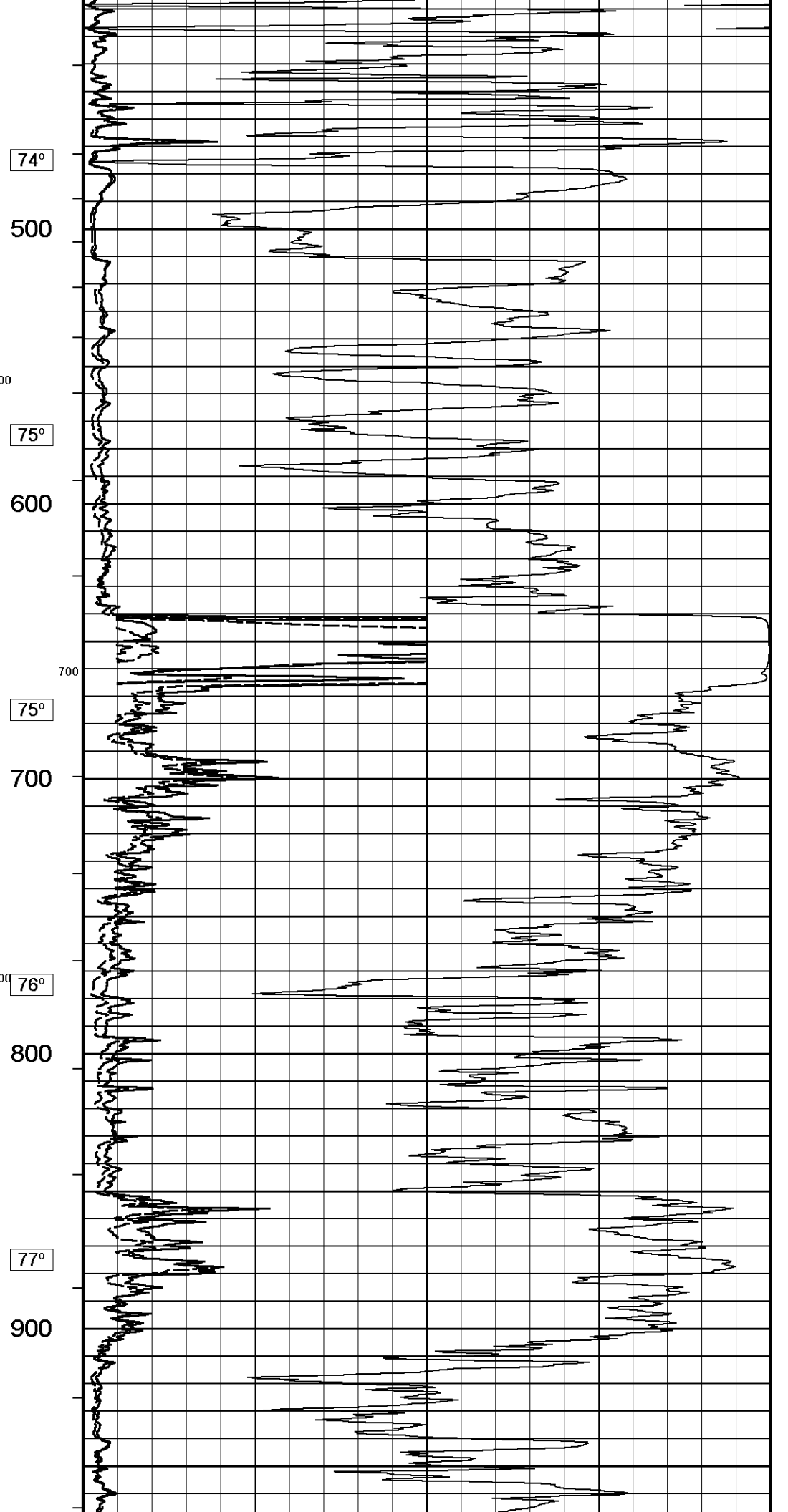
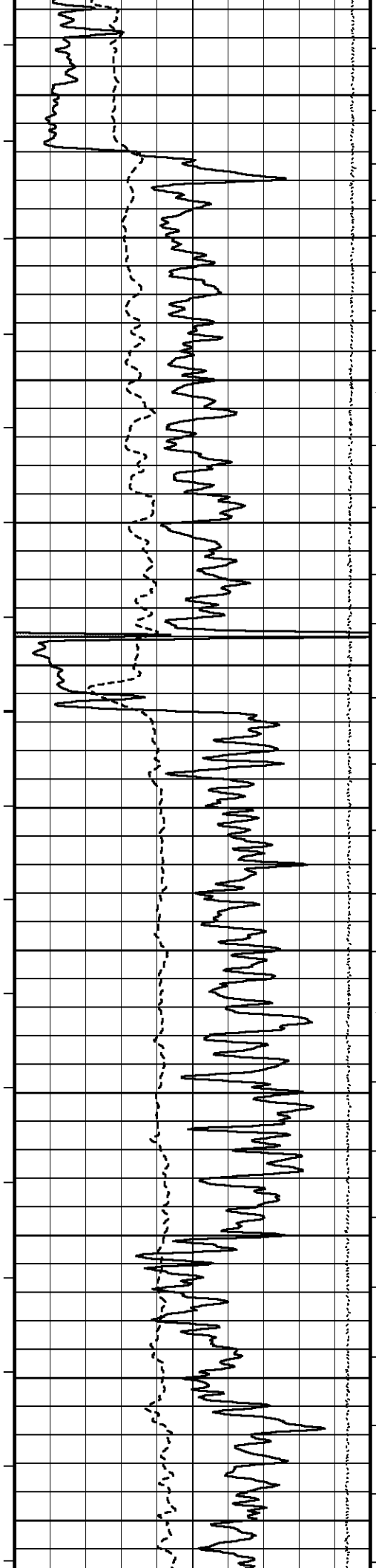
TRIS: DORE #2.

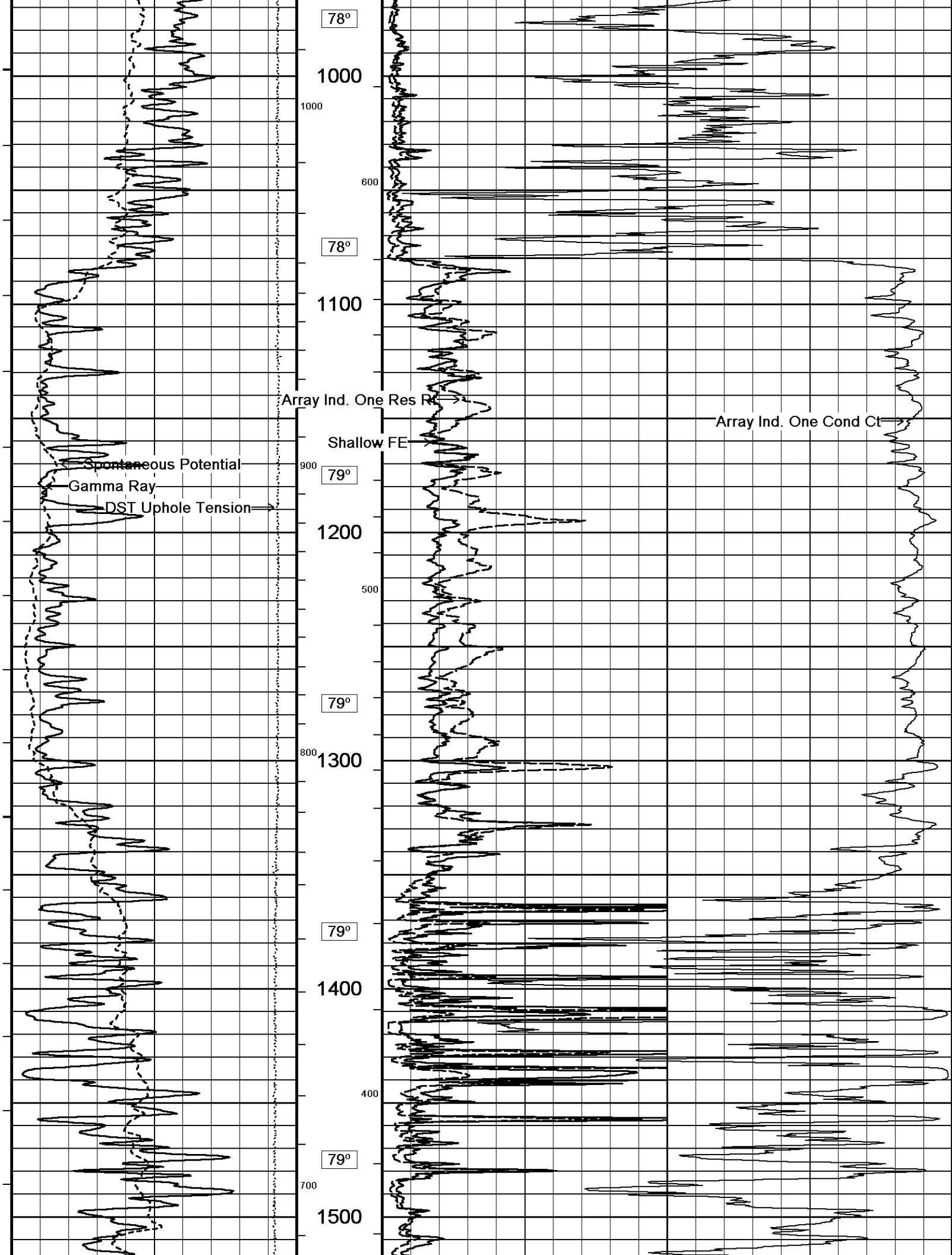
- ENGINEER: A. SILL.

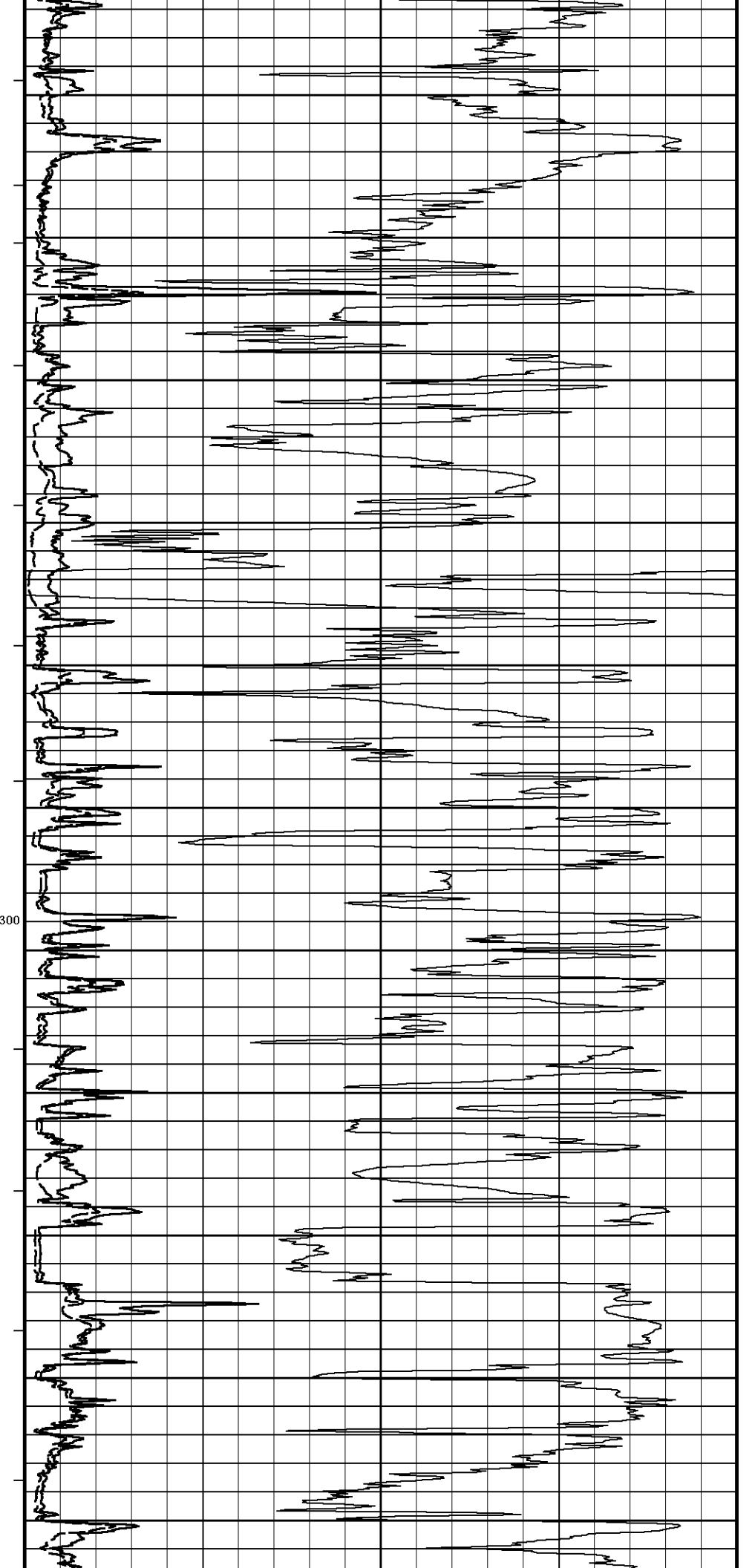
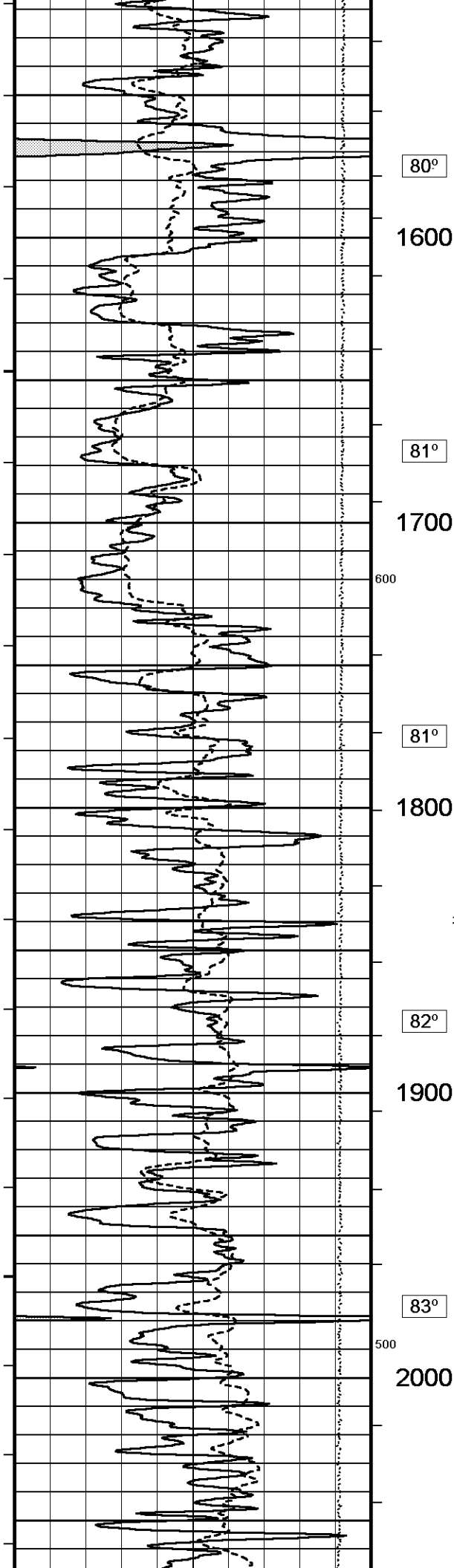
- OPERATOR: J. LaPOINT.

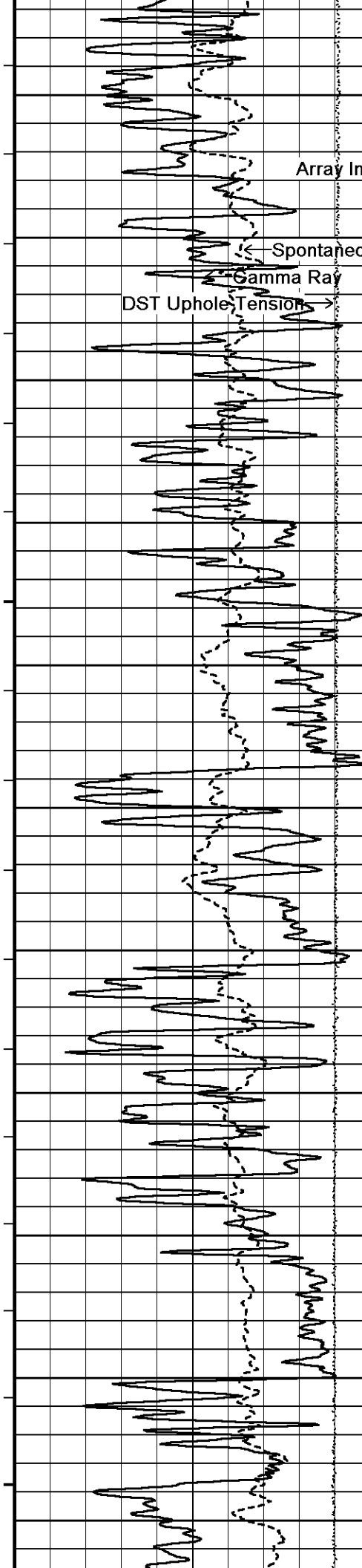
In interpreting, communicating or providing information and/or making recommendations, either written or oral, as to logs or test or other data, type or amount of material, or Work or other service to be furnished, or manner of performance, or in predicting results to be obtained, the Contractor will give the Company the benefit of the Contractor's best judgment based on its experience and will perform all such Work in a good and workmanlike manner. Any interpretation of test or other data, and any recommendation or reservoir description based upon such interpretations, are opinions based upon inferences from measurements and empirical relationships and assumptions, which inferences and assumptions are not infallible, and with respect to which professional engineers and analysts may differ. ACCORDINGLY ANY INTERPRETATION OR RECOMMENDATION RESULTING FROM THE SERVICES WILL BE AT THE SOLE RISK OF THE COMPANY, AND THE CONTRACTOR CANNOT AND DOES NOT WARRANT THE ACCURACY, CORRECTNESS OR COMPLETENESS OF ANY SUCH INTERPRETATION OR RECOMMENDATION, WHICH INTERPRETATIONS AND RECOMMENDATIONS SHOULD NOT, THEREFORE, UNDER ANY CIRCUMSTANCES BE RELIED UPON AS THE SOLE OR MAIN BASIS FOR ANY DRILLING, COMPLETION, WELL TREATMENT, PRODUCTION OR FINANCIAL DECISION, OR ANY PROCEDURE INVOLVING ANY RISK TO THE SAFETY OF ANY DRILLING ACTIVITY, DRILLING RIG OR ITS CREW OR ANY OTHER INDIVIDUAL. THE COMPANY HAS FULL RESPONSIBILITY FOR ALL DECISIONS CONCERNING THE SERVICES.



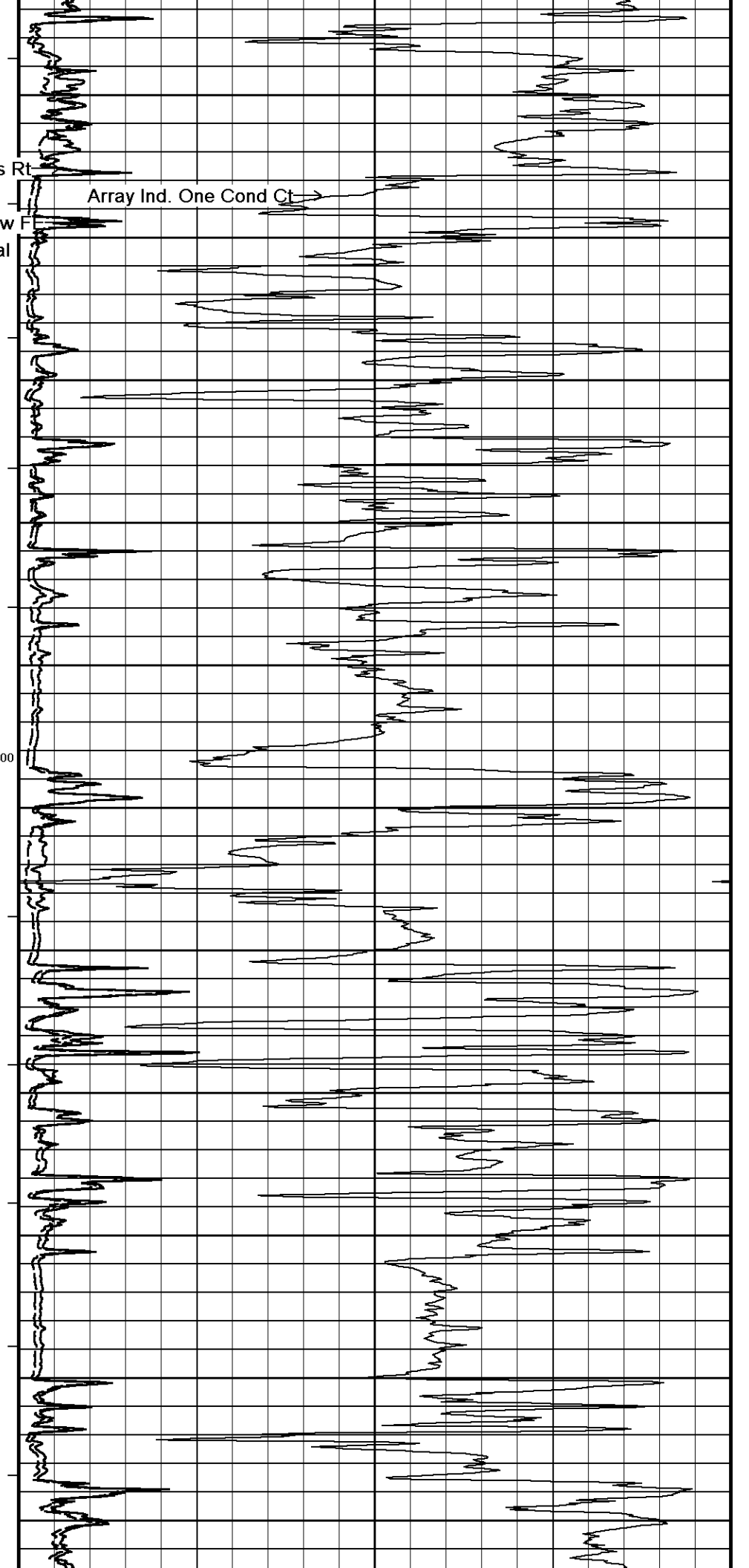


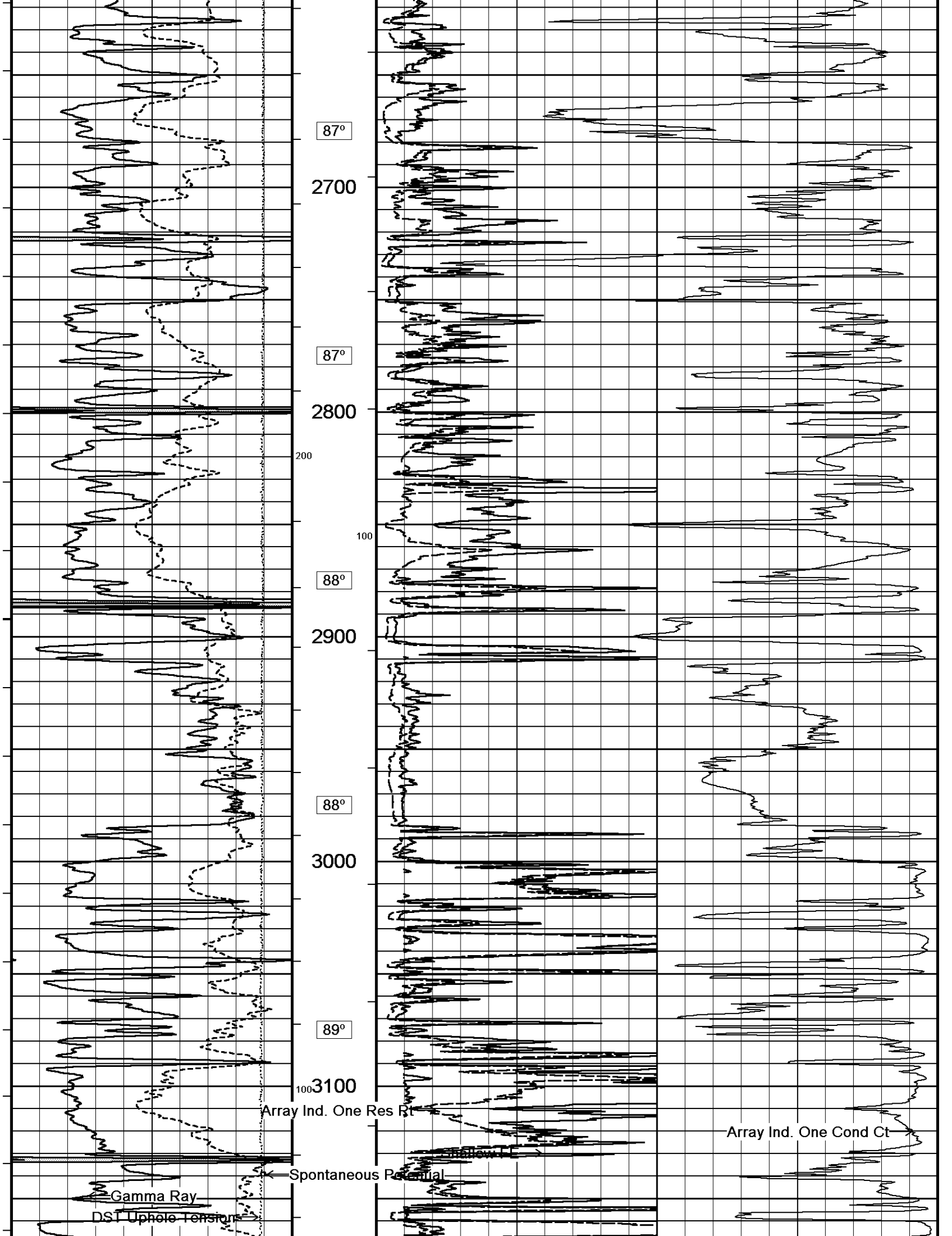


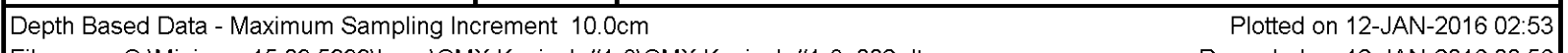




83°
2100
Array Ind. One Res Rt
Shallow F
84°
2200
400
84°
2300
200
85°
2400
85°
2500
300
86°
2600







↑

2 INCH MAIN

↑

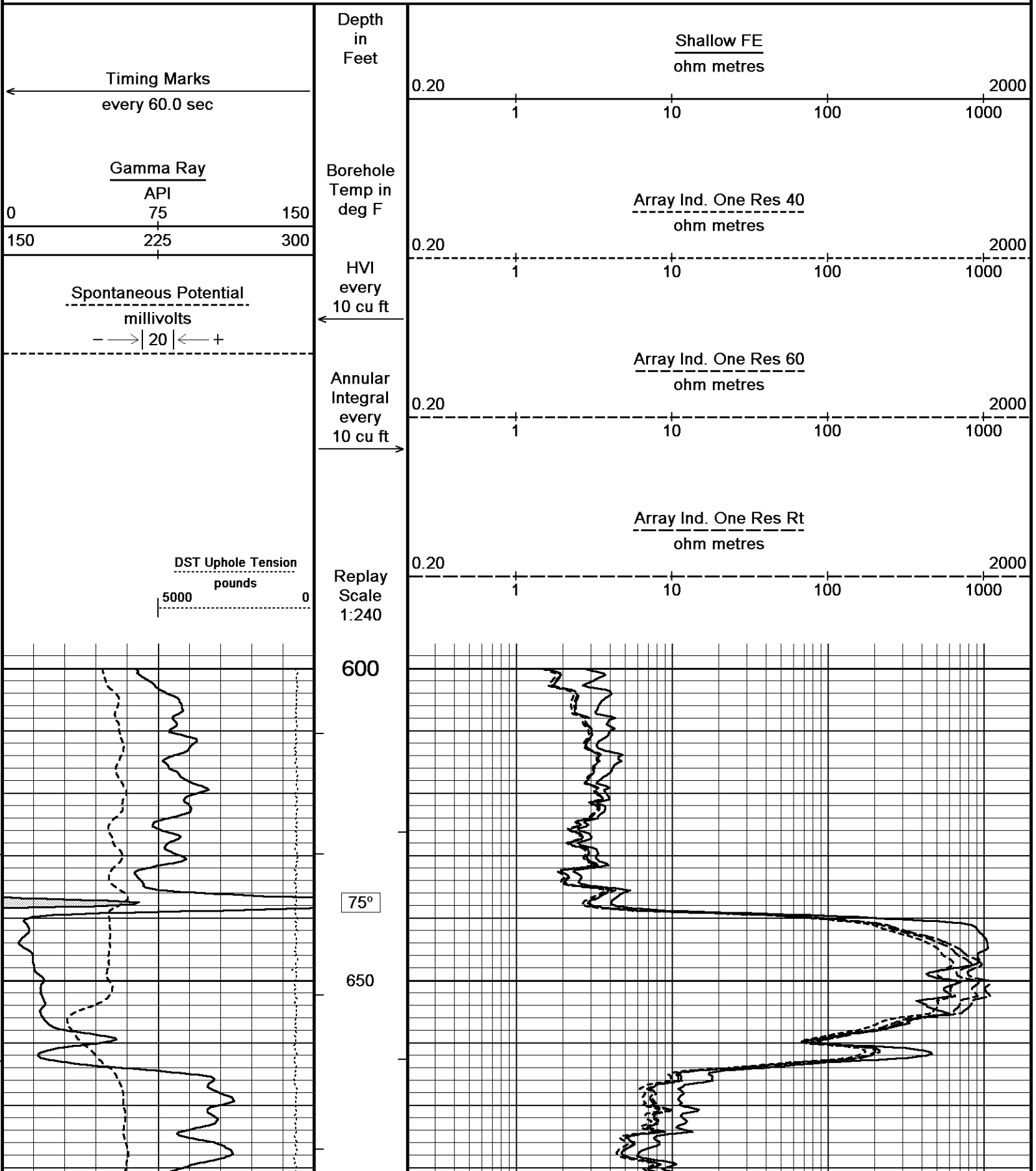
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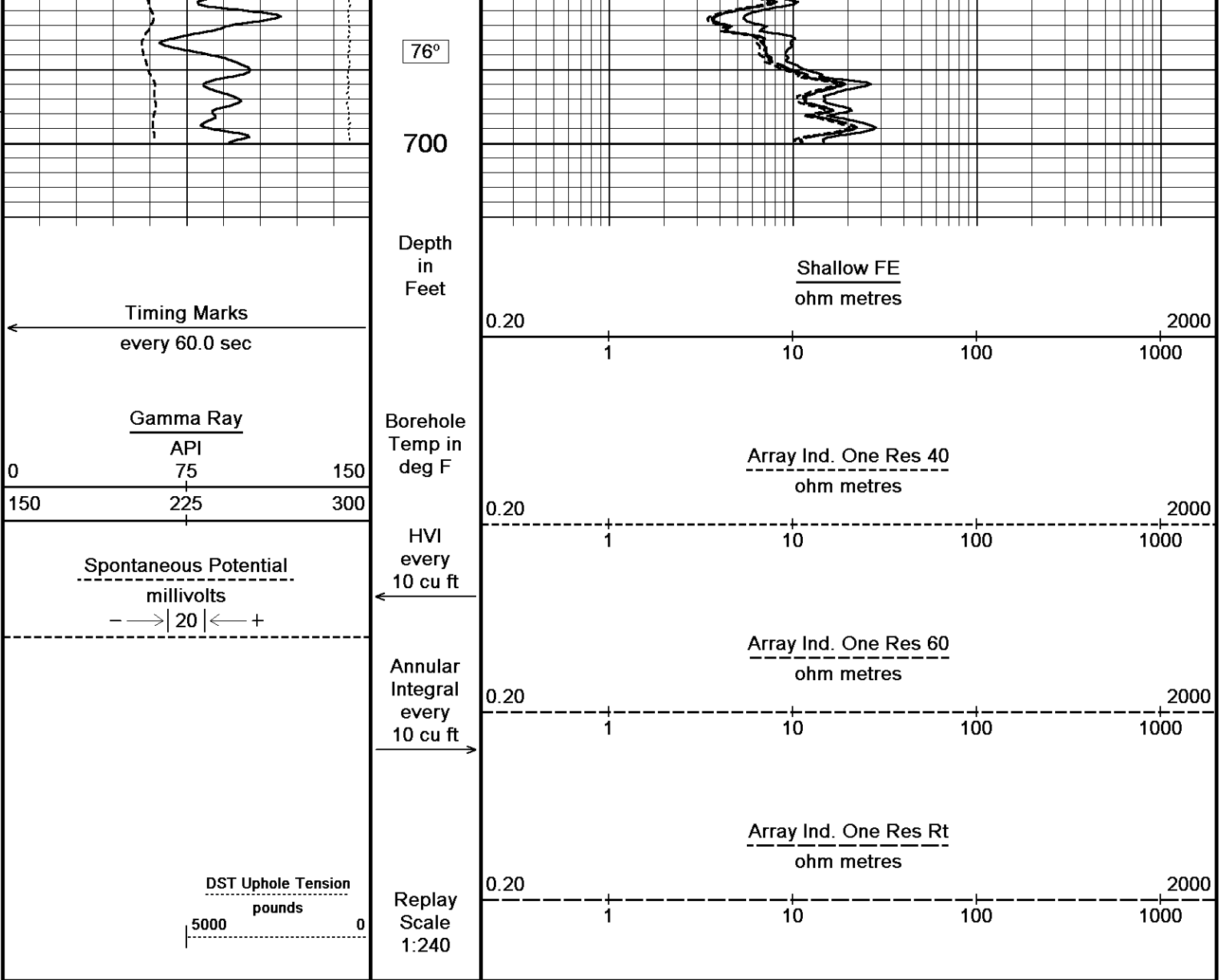
5 INCH MAIN - ANHYDRITE

↓

Depth Based Data - Maximum Sampling Increment 10.0cm
Filename: C:\Minimus 15.03.5939\Logs\CMX Kozisek #1-8\CMX Kozisek #1-8_002.dta
System Versions: Logged with 15.03.5939 Plotted with 15.03.5939

Plotted on 12-JAN-2016 02:53
Recorded on 12-JAN-2016 00:56





Depth Based Data - Maximum Sampling Increment 10.0cm

Plotted on 12-JAN-2016 02:53

Filename: C:\Minimus 15.03.5939\Logs\CMX Kozisek #1-8\CMX Kozisek #1-8_002.dta

Recorded on 12-JAN-2016 00:56

System Versions: Logged with 15.03.5939 Plotted with 15.03.5939

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5 INCH MAIN - ANHYDRITE

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↓

5 INCH MAIN

↓

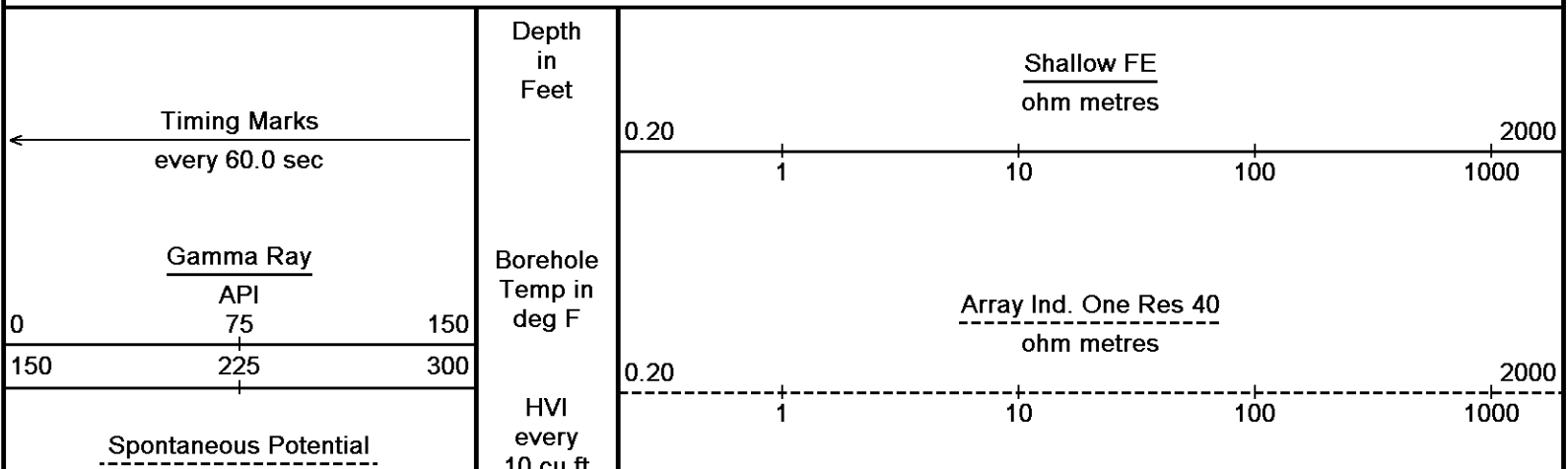
Depth Based Data - Maximum Sampling Increment 10.0cm

Plotted on 12-JAN-2016 02:53

Filename: C:\Minimus 15.03.5939\Logs\CMX Kozisek #1-8\CMX Kozisek #1-8_002.dta

Recorded on 12-JAN-2016 00:56

System Versions: Logged with 15.03.5939 Plotted with 15.03.5939



millivolts

—→| 20 |←—+

10 cu ft

Annular
Integral
every
10 cu ft

Array Ind. One Res 60
ohm metres

0.20

1

10

100

1000

2000

Array Ind. One Res Rt
ohm metres

0.20

1

10

100

1000

2000

DST Uphole Tension
pounds

5000

0

Replay
Scale
1:240

2300

200

85°

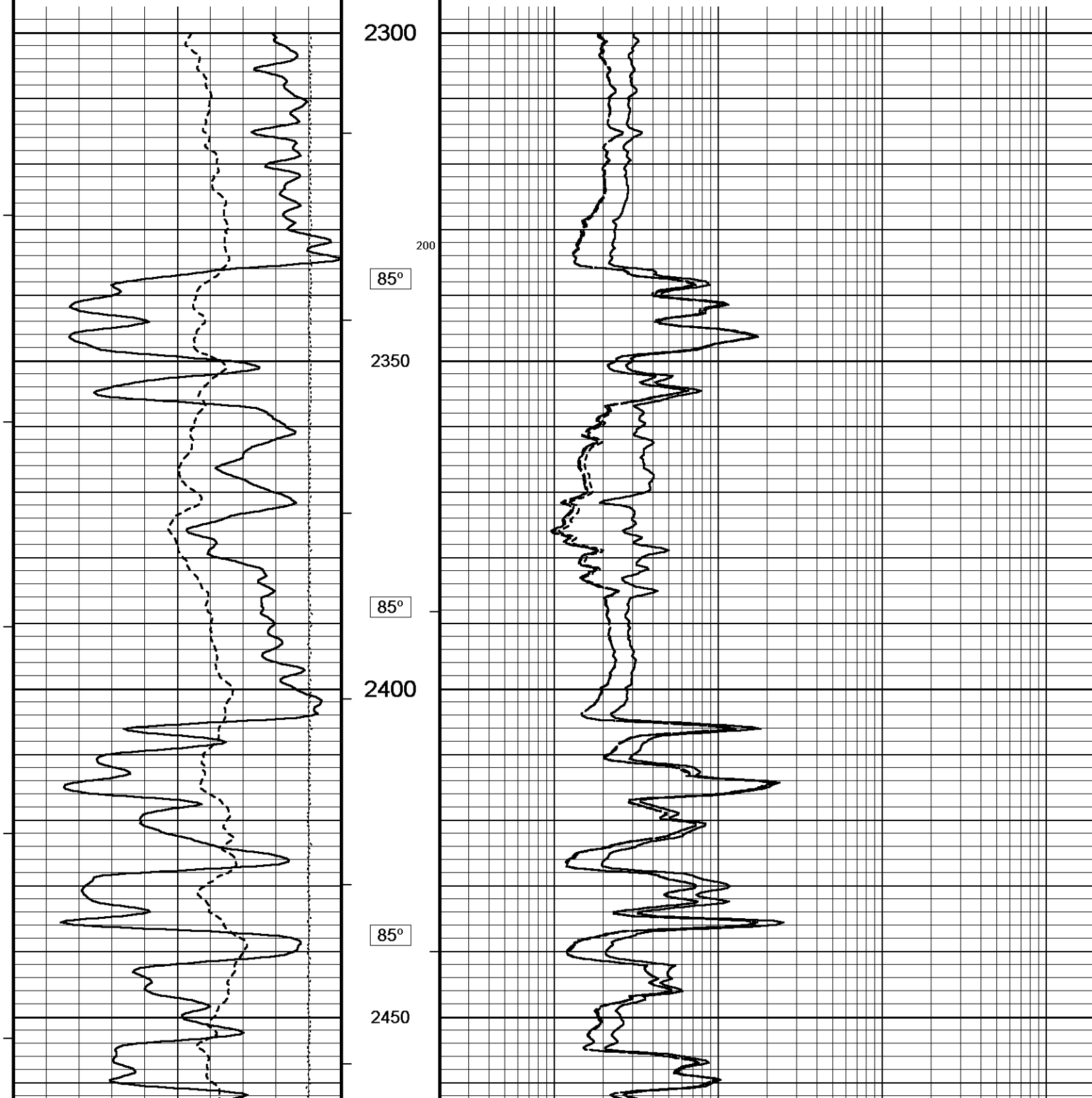
2350

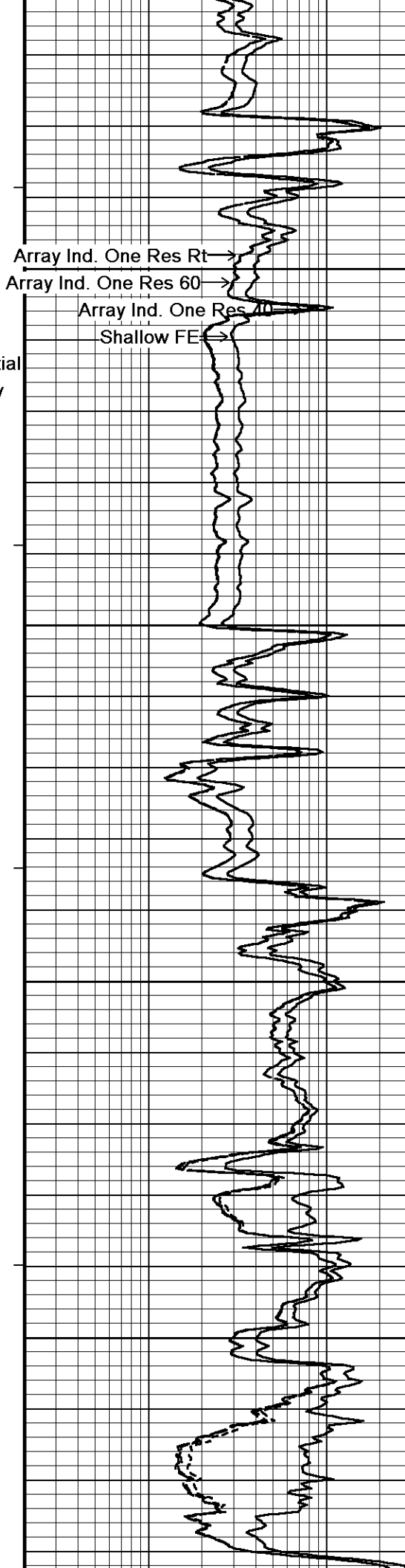
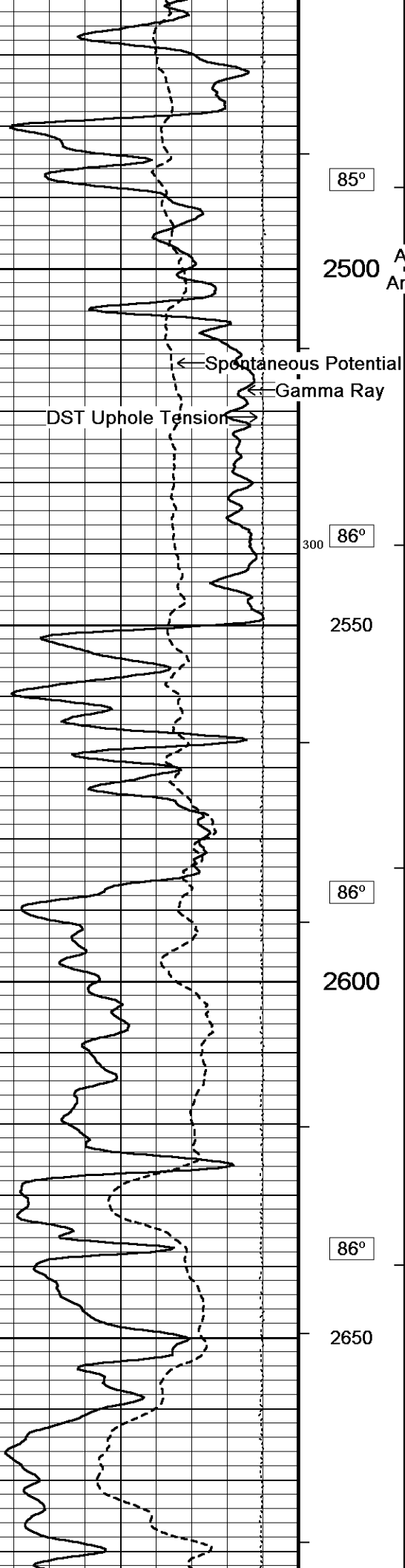
85°

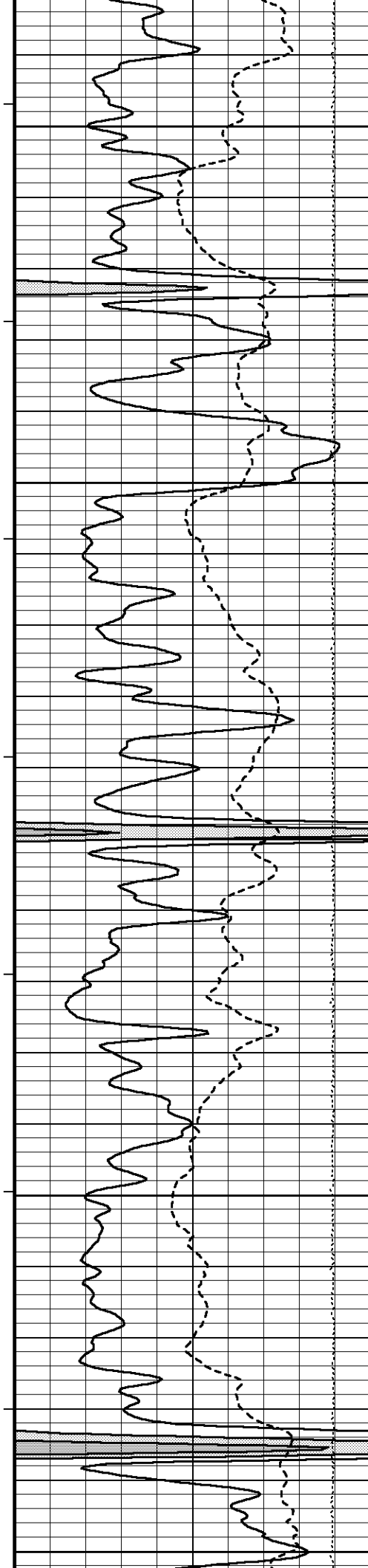
2400

85°

2450







87°

2700

87°

2750

87°

2800

200

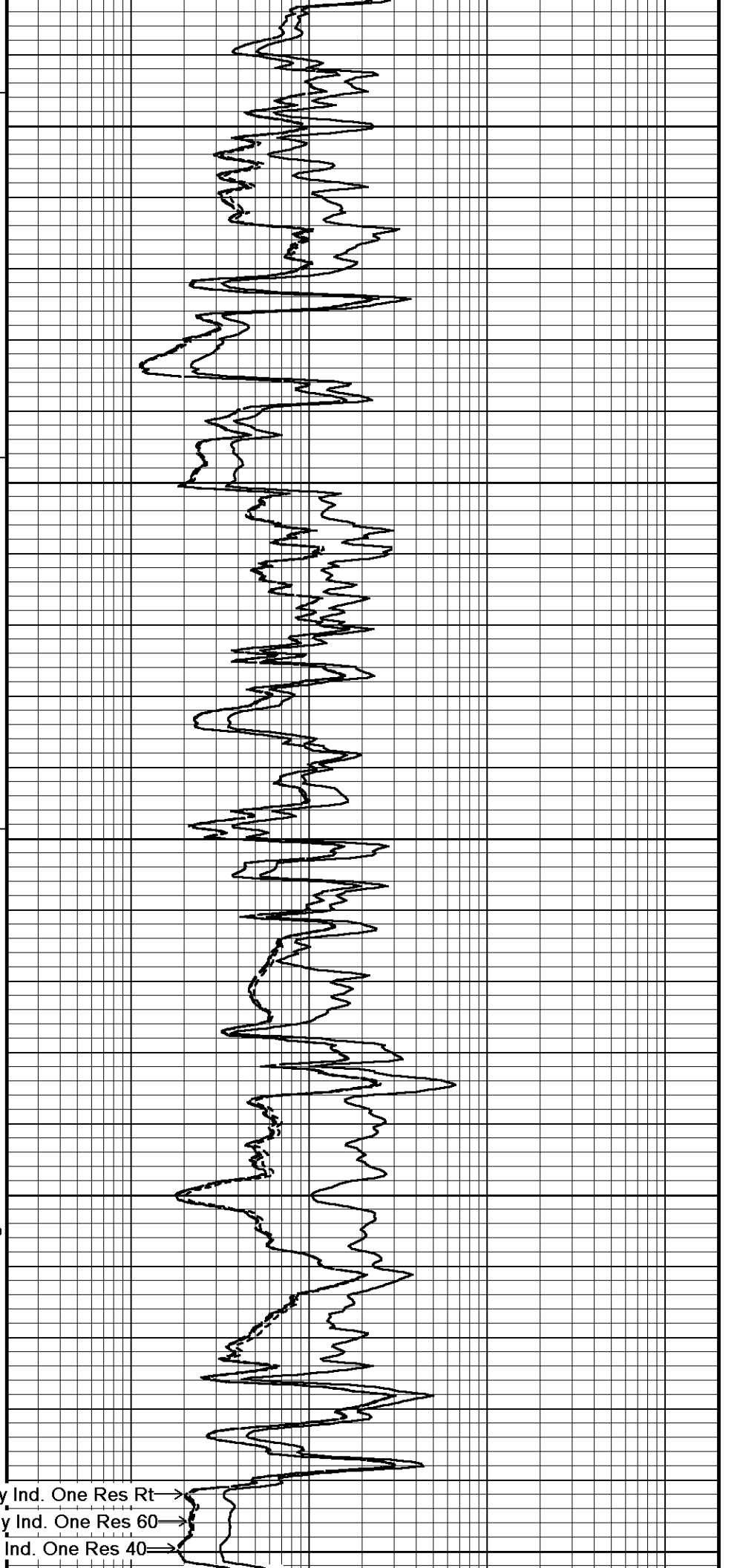
88°

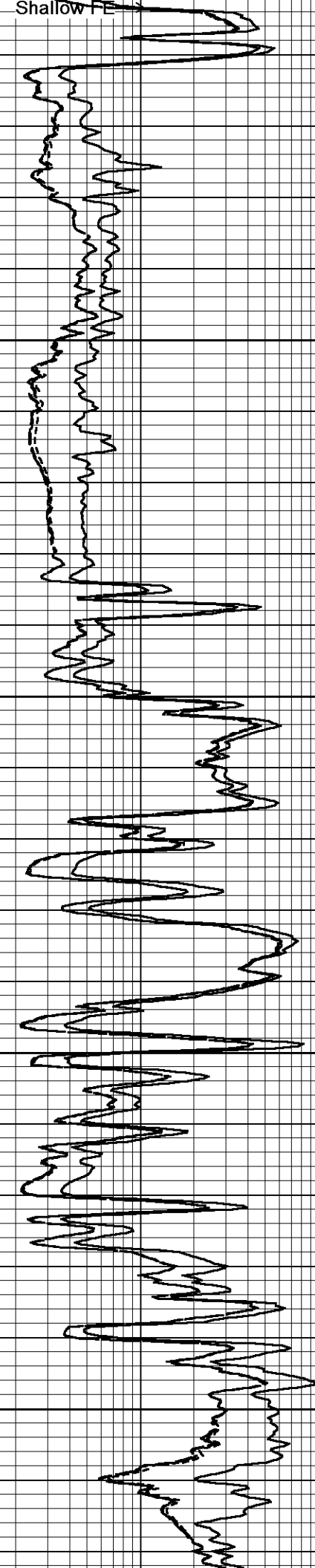
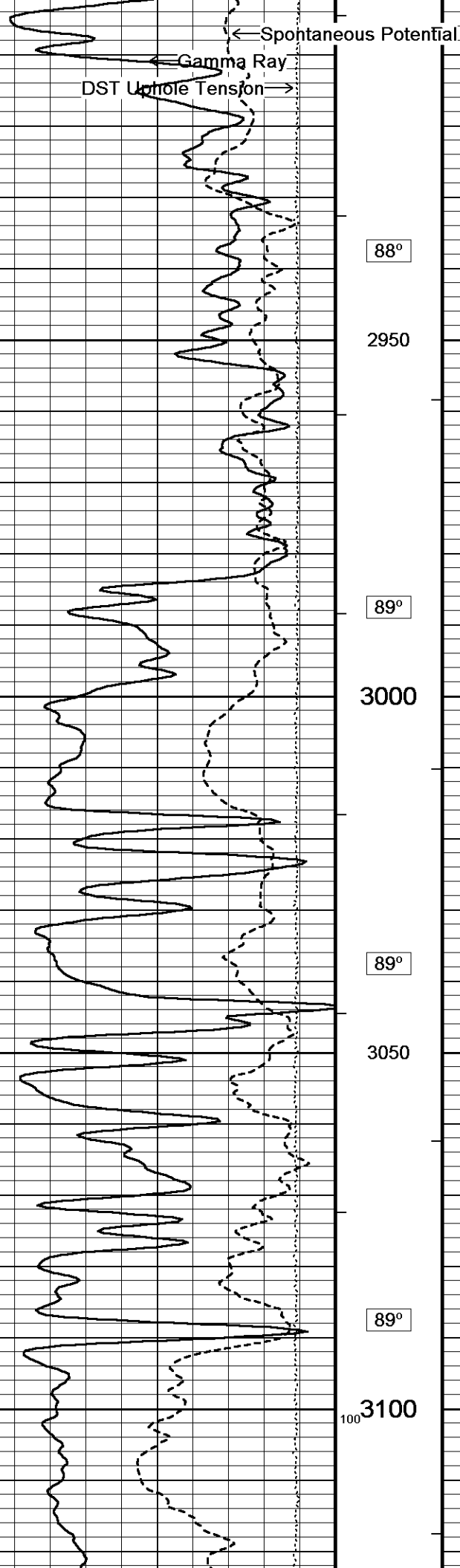
2850

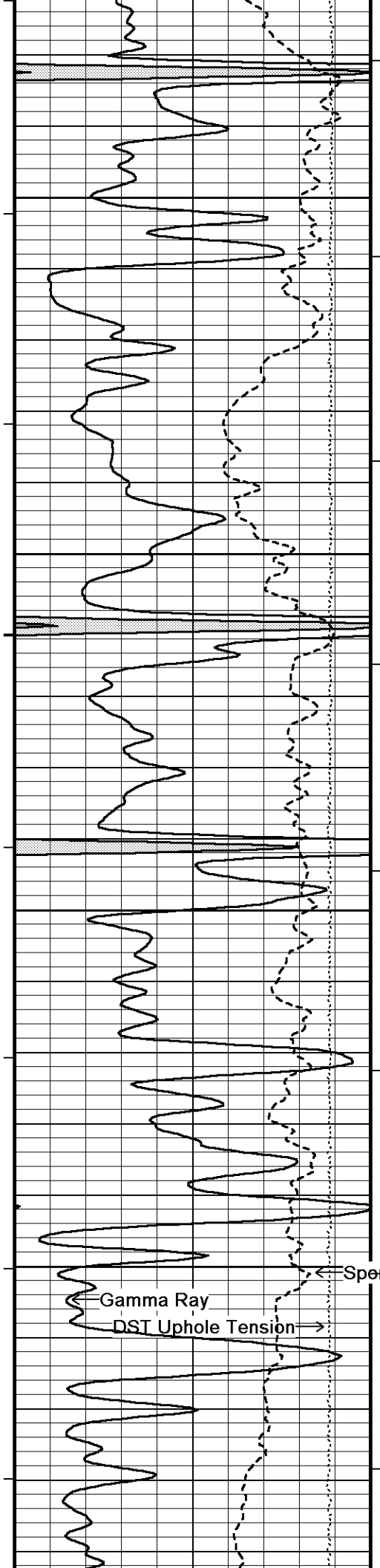
100

88°

Array Ind. One Res Rt →
Array Ind. One Res 60 →
2900ay Ind. One Res 40 →







89°

3150

89°

3200

90°

3250

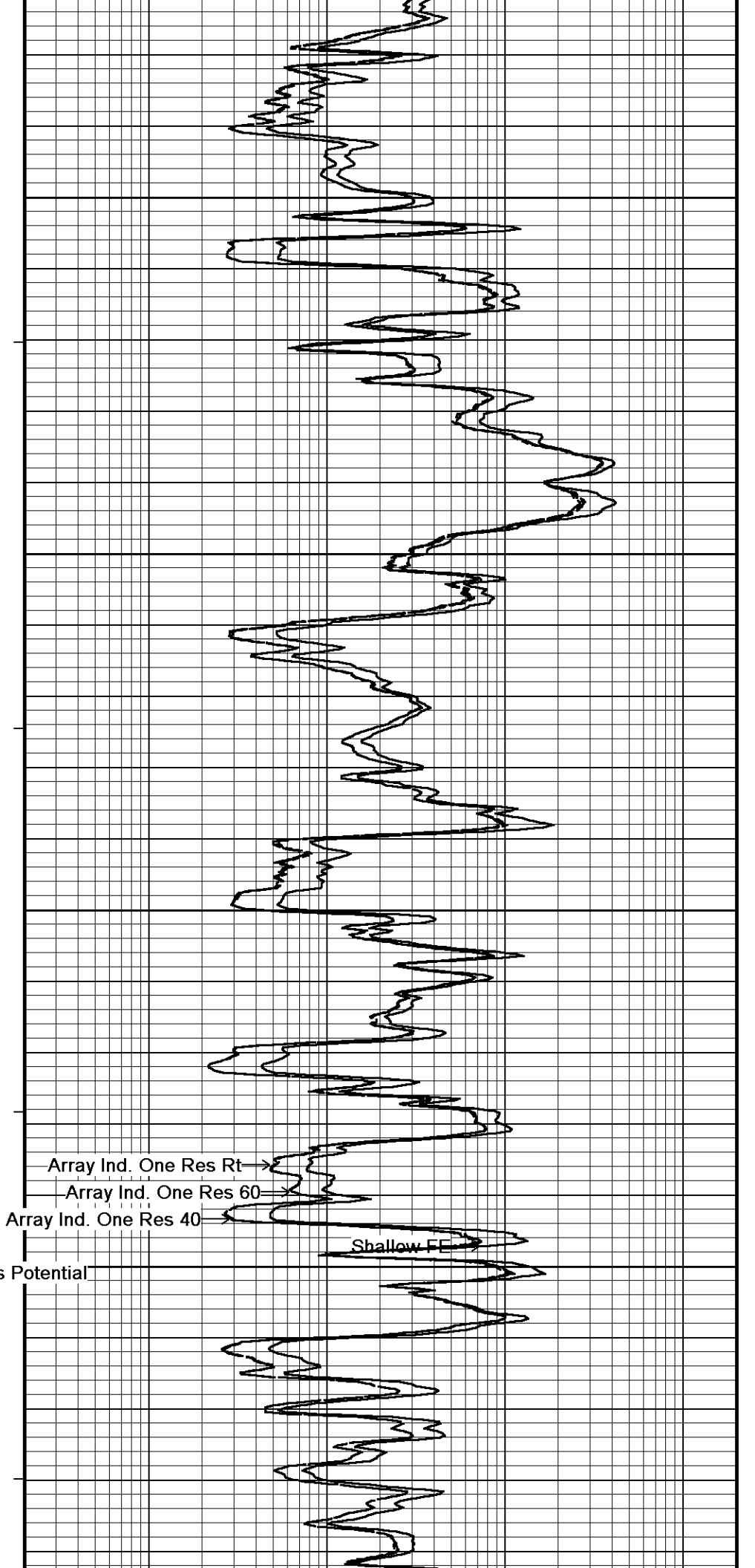
90°

Spent 3300s Potential

Gamma Ray

DST Uphole Tension

89°

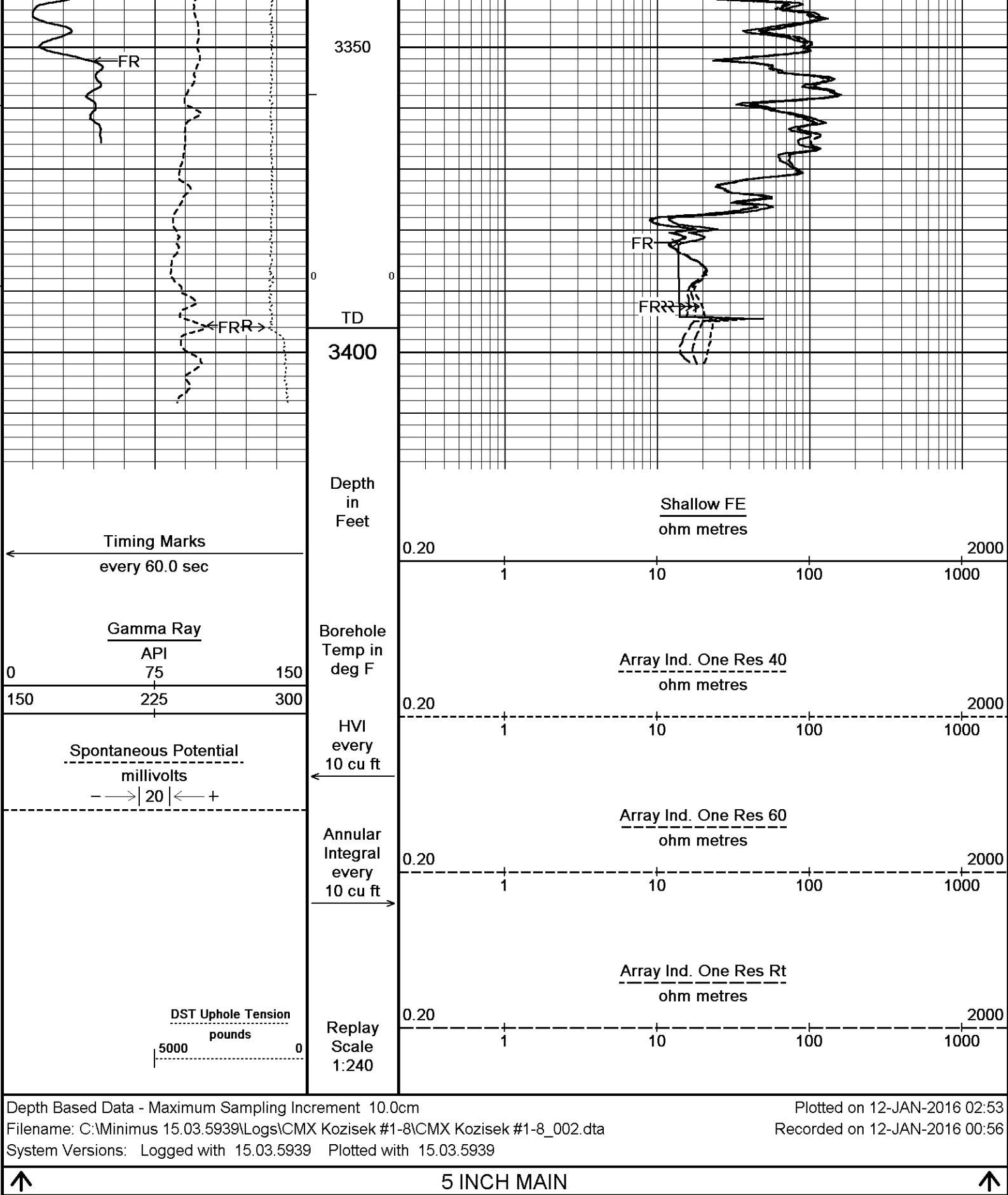


Array Ind. One Res Rt

Array Ind. One Res 60

Array Ind. One Res 40

Shallow FE



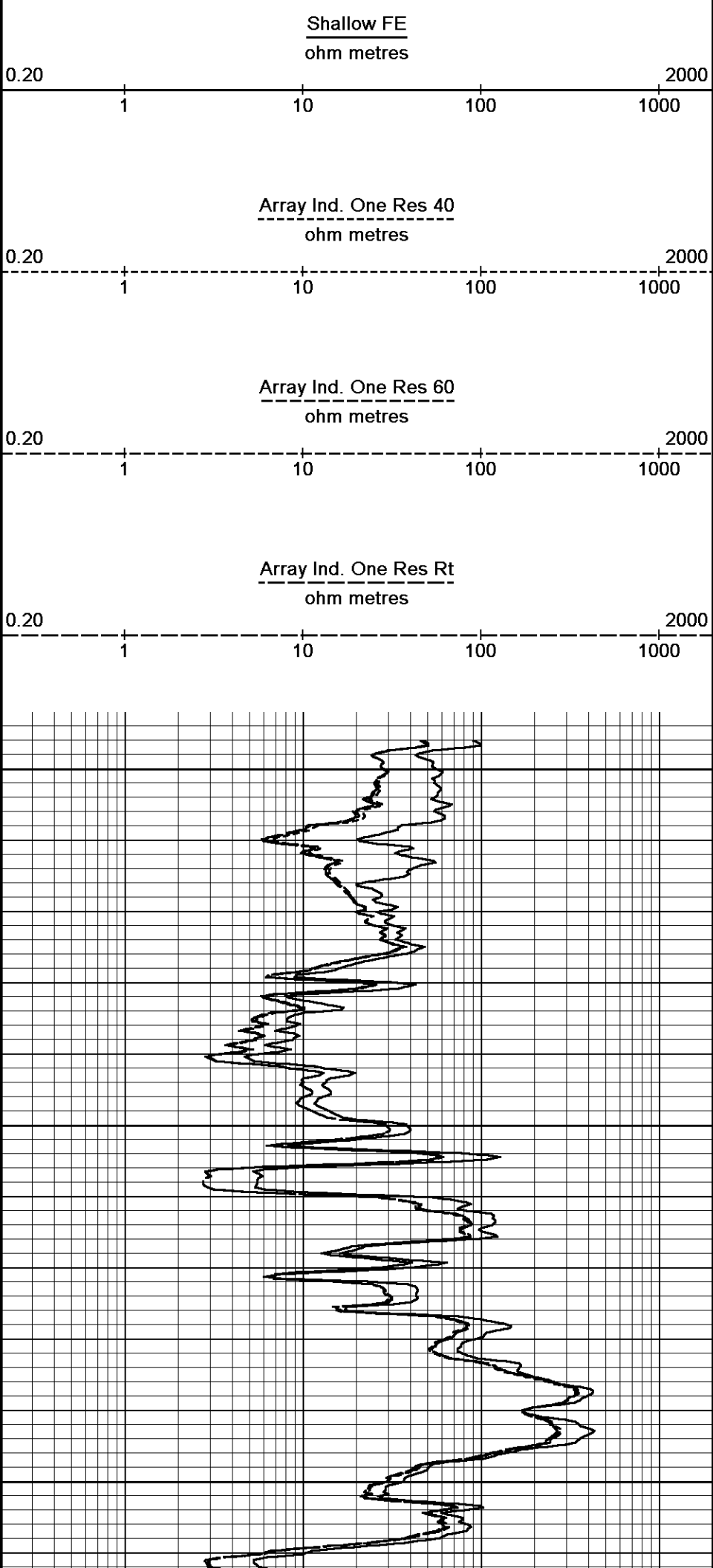
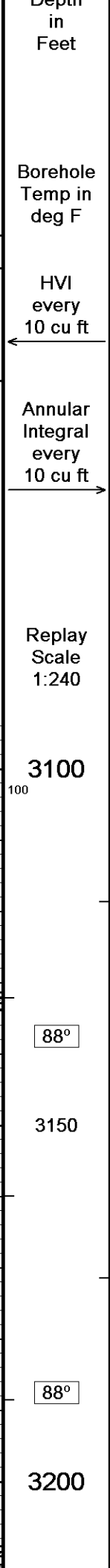
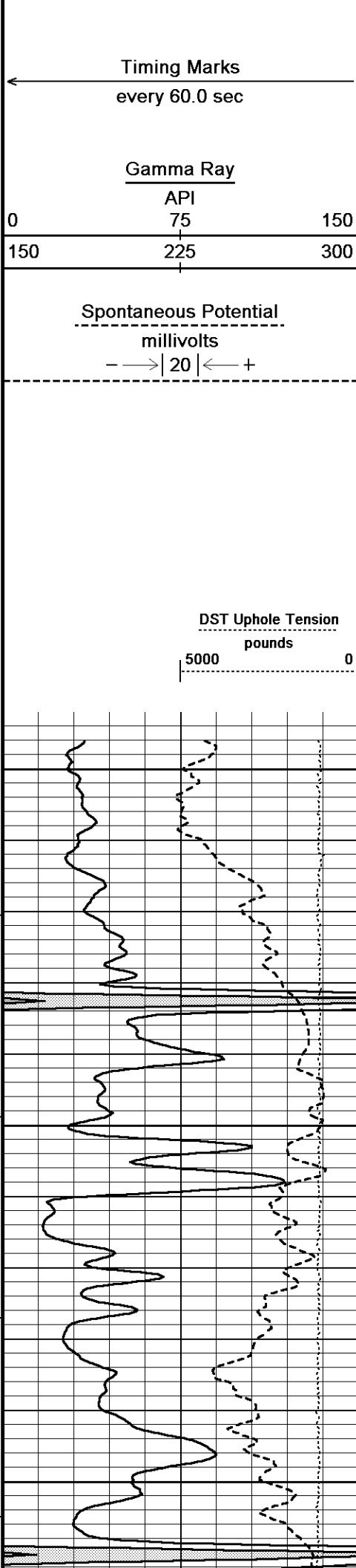
Depth Based Data - Maximum Sampling Increment 10.0cm
Filename: C:\Minimus 15.03.5939\Logs\CMX Kozisek #1-8\CMX Kozisek #1-8_002.dta
System Versions: Logged with 15.03.5939 Plotted with 15.03.5939

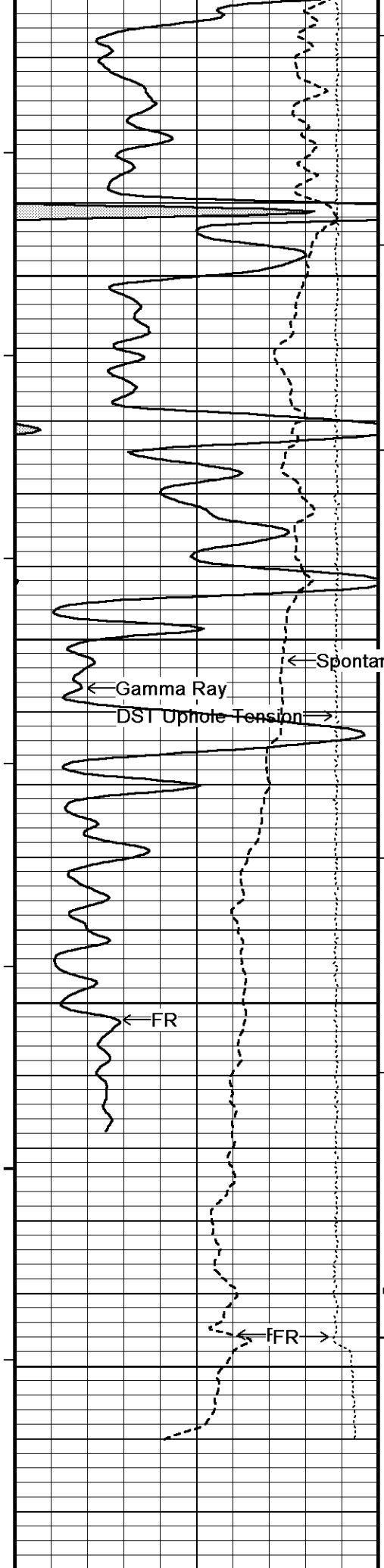
Plotted on 12-JAN-2016 02:53
Recorded on 12-JAN-2016 00:56

REPEAT SECTION

Depth Based Data - Maximum Sampling Increment 10.0cm
Filename: C:\Minimus 15.03.5939\Logs\CMX Kozisek #1-8\CMX Kozisek #1-8_001.dta
System Versions: Logged with 15.03.5939 Plotted with 15.03.5939

Plotted on 12-JAN-2016 02:53
Recorded on 12-JAN-2016 00:24





88°

3250

88°

3300

88°

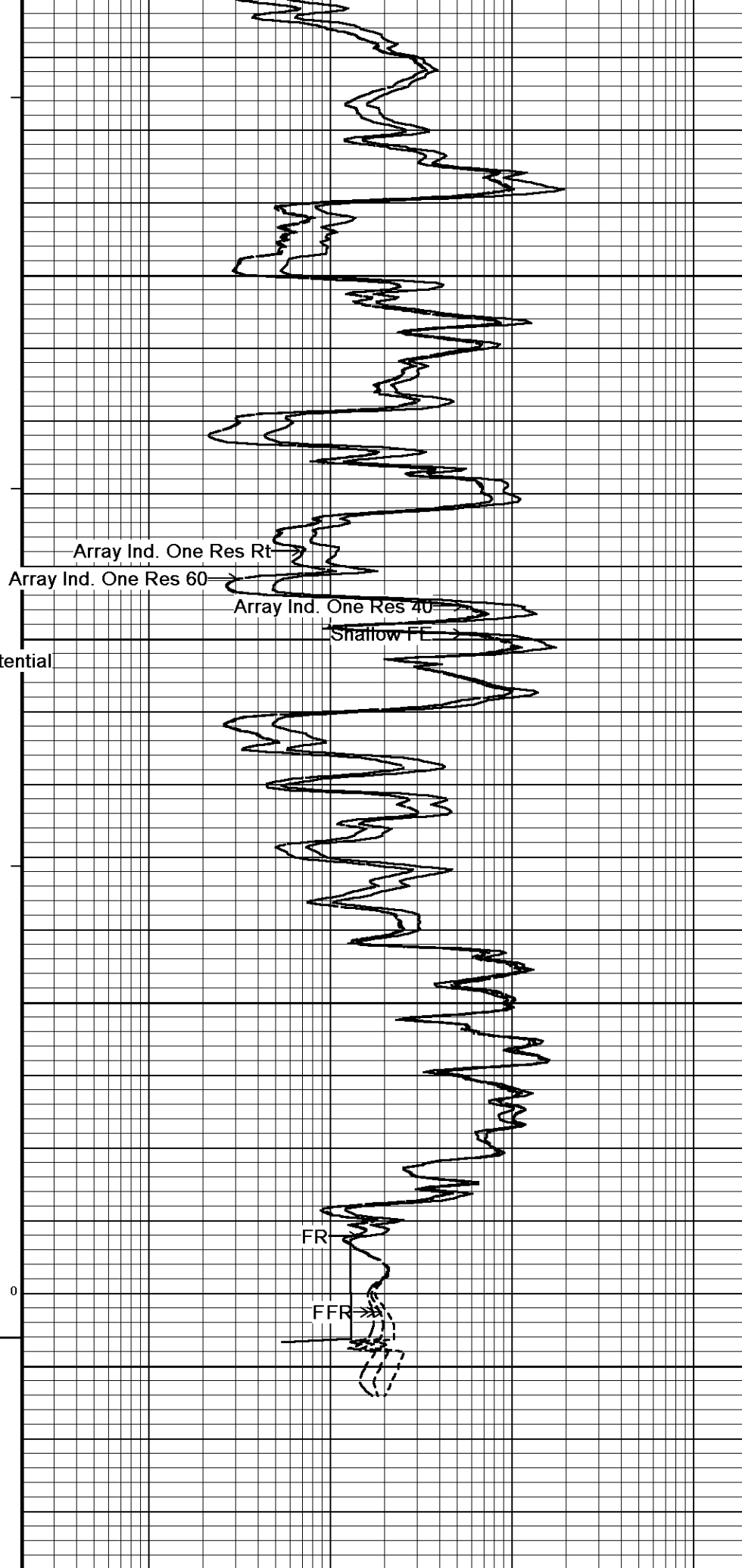
3350

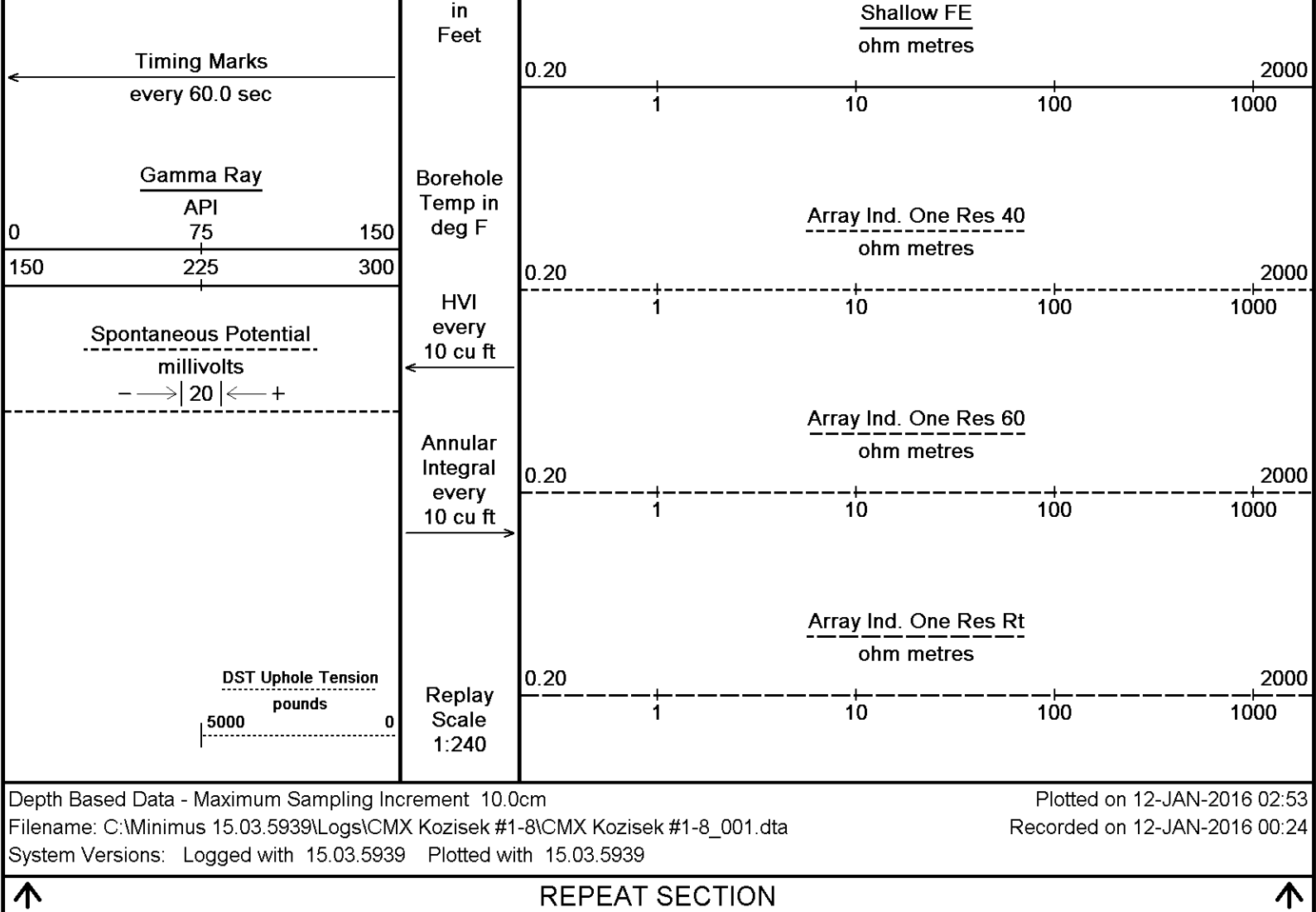
0

TD

3400

Depth





BEFORE SURVEY CALIBRATION		
C:\Minimus 15.03.5939\Logs\CMX Kozisek #1-8\CMX Kozisek #1-8_001.dta		
General Constants All 000		Last Edited on 12-JAN-2016,00:01
General Parameters		
Mud Resistivity	0.830	ohm-metres
Mud Resistivity Temperature	75.000	degrees F
Water Level	0.000	feet
Borehole Fluid 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	5.500	inches
Caliper for Differential Caliper	None	
Rwa Parameters		
Porosity used	Crossplot Porosity	
Resistivity used	Deep Induction	
RWA Constant A	0.610	
RWA Constant M	2.150	
SW/APOR Tool Source	0.000	
Gamma Calibration MCG-C 123		Field Calibration on 10-JAN-2016 07:56
	Measured	Calibrated (API)
Background	74	51
Calibrator (Gross)	728	507
Calibrator (Net)	654	456

Gamma Calibration Tolerances MCG-C 123

Ratio 1.434  Counts/API

Gamma Constants MCG-C 123

Last Edited on 11-JAN-2016,22:45

Gamma Calibrator Number MCGGRCC141
 GRC-M Calibrator Jig in Use? NO
 Inactive Background Jig in Use? NO
 Mud Density 1.08 gm/cc
 Caliper Source for Processing Density Caliper
 Tool Position Eccentred
 Potassium Equivalence Chloride
 K Mud Concentration 0.00 %

High Resolution Temperature Calibration MCG-C 123

Field Calibration on 31-OCT-2015,17:05

	Measured	Calibrated(Deg F)
Lower	50.00	50.00
Upper	100.00	100.00

High Resolution Temperature Constants MCG-C 123

Last Edited on 22-SEP-2015,11:43

Pre-filter Length 11

FE Calibration MFE-A.A 135

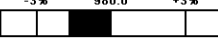
Base Calibration on 08-DEC-2015 14:21

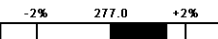
Field Check on 10-JAN-2016 07:29

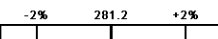
Base Calibration

	Measured	Calibrated (ohm-m)
Reference 1	0.0	0.0
Reference 2	963.1	126.8
Base Check		281.2
Field Check		281.4

FE Calibration Tolerances MFE-A.A 135

Reference 2 963.1  ohm

Base Check 281.2  ohm-m

Field Check 281.4  ohm-m

FE Constants MFE-A.A 135

Last Edited on 11-JAN-2016,22:44

Running Mode No Sleeve
 MFE K Factor 0.1268

Borehole Correction Constants
 Sonde Position 0.5 inches
 Hole Size Source Density Caliper
 Hole Size Constant Value N/A inches
 Rm Source Global Value: Temperature Corrected
 Temp. for Rm Corr. MCG External Temperature

Induction Calibration MAI-A.A 111

Base Calibration on 05-AUG-2014,09:34

Field Check on 10-JAN-2016 07:27

Base Calibration

Test Loop Calibration Channel	Measured		Calibrated (mmho/m)	
	Low	High	Low	High
1	17.6	473.6	9.3	966.2
2	6.4	385.9	7.6	821.4
3	3.2	264.0	5.2	566.0
4	2.1	135.5	2.6	279.2

Array Temperature 23.0 Deg F

Test Loop Calibration Verified 09-DEC-2015 11:03

Channel	Base Check (mmho/m)		Field Check (mmho/m)	
	Low	High	Low	High

1	12.1	3873.0	9.4	3870.7
2	29.8	3528.1	27.6	3525.3
3	29.1	3021.3	27.2	3018.7
4	19.1	2058.5	17.9	2056.5
Deep	17.7	1962.1	16.4	1960.1
Medium	43.1	3976.4	40.6	3973.1
Shallow	44.4	5232.7	41.2	5229.0
Array Temperature	65.8		60.4	Deg F

Induction Calibration Tolerances MAI-A.A 111

Low Conductivity 1	17.6		mmho/m	High Conductivity 1	473.6		mmho/m
Low Conductivity 2	6.4		mmho/m	High Conductivity 2	385.9		mmho/m
Low Conductivity 3	3.2		mmho/m	High Conductivity 3	264.0		mmho/m
Low Conductivity 4	2.1		mmho/m	High Conductivity 4	135.5		mmho/m
Background Vx 1	0.0		mmho/m	Phase Check Loop 1	0.0		%
Background Vx 2	0.0		mmho/m	Phase Check Loop 2	0.0		%
Background Vx 3	0.0		mmho/m	Phase Check Loop 3	0.0		%
Background Vx 4	0.0		mmho/m	Phase Check Loop 4	0.0		%

Induction Constants MAI-A.A 111

Last Edited on 11-JAN-2016,22:44

Induction Model	RtAP-WBM		
Borehole Correction Constants			
Tool Centred	No		
Hole Size Source	Density Caliper		
Hole Size Constant Value	N/A	inches	
Stand-off Type	Fins		
Stand-off	0.50	inches	
Number of Fins on Stand-off	8.0000		
Stand-off Fin Angle	45.00	degrees	
Stand-off Fin Width	0.5000	inches	
Rm Source	Global Value: Temperature Corrected		
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	
Symmetrised Receiver Gains			
Receiver 1	1.00		
Receiver 2	1.00		
Receiver 3	1.00		
Receiver 4	1.00		
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.A 216

Base Calibration on 08-DEC-2015 13:20
Field Calibration on 10-JAN-2016 07:32

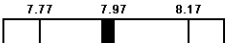
Base Calibration

Reading No	Measured	Calibrator Size (in)
1	20896	3.99
2	31104	5.98
3	41152	7.97
4	51010	9.86
5	61632	11.92
6	N/A	N/A

Field Calibration

Measured Caliper (in)	Actual Caliper (in)
7.93	7.97

Caliper Calibration Tolerances MPD-C.A 216

Short Arm Field Cal. 7.93  in

DOWNHOLE EQUIPMENT

C:\Minimus 15.03.5939\Logs\CMX Kozisek #1-8\CMX Kozisek #1-8_001.dta

Cablehead, 11 pin
CBH-CA 155 LG: 2.40 ft WT: 24.3 lb OD: 2.244 in

Compact Comms Gamma
MCG-C 123 LG: 8.70 ft WT: 63.9 lb OD: 2.244 in

Compact Micro-Resistivity
MMR-C.A 247 LG: 8.59 ft WT: 81.6 lb OD: 4.882 in

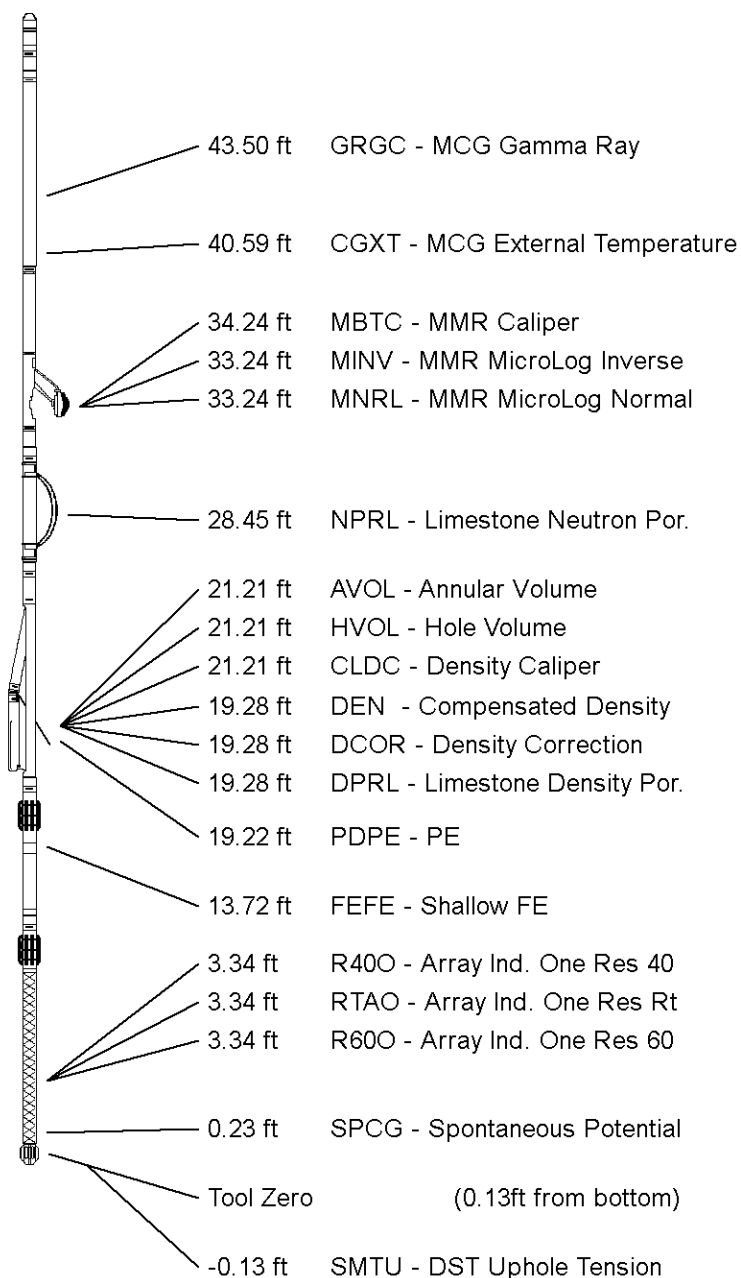
Compact Neutron
MDN-A.B 114 LG: 5.04 ft WT: 50.7 lb OD: 2.244 in

Compact Density/Caliper
MPD-C.A 216 LG: 9.59 ft WT: 90.4 lb OD: 2.449 in

Compact Focussed Electric
MFE-A.A 135 LG: 6.05 ft WT: 48.5 lb OD: 2.244 in

Compact Induction
MAI-A.A 111 LG: 10.81 ft WT: 48.5 lb OD: 2.244 in

Total Length: 51.18 ft Weight: 407.9 lb



COMPANY CMX, INC.
WELL KOZISEK #1-8
FIELD STOLTENBERG
PROVINCE/COUNTY ELLSWORTH
COUNTRY/STATE U.S.A. / KANSAS

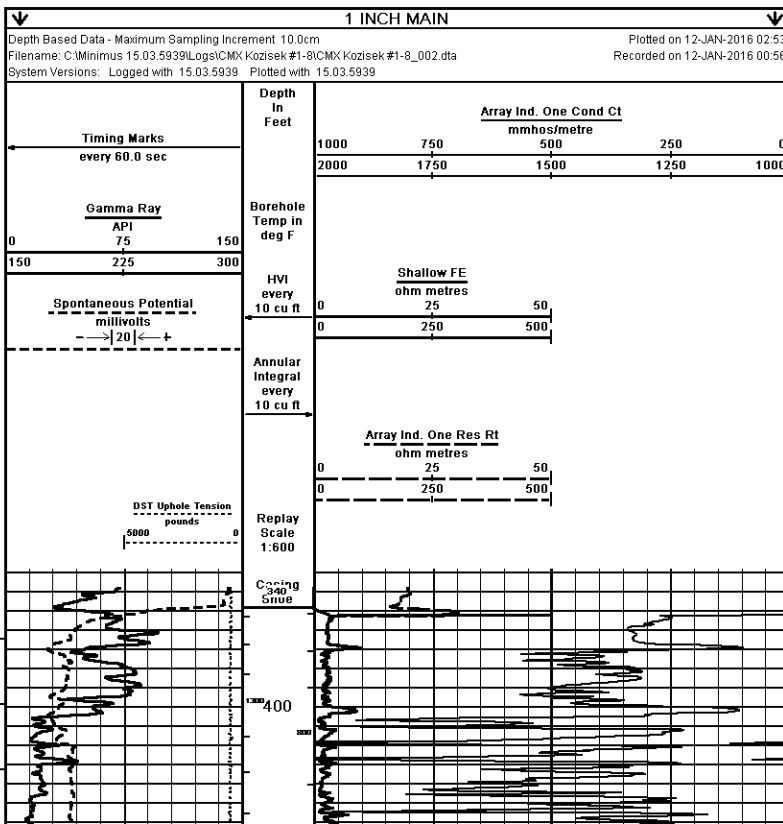
Elevation Kelly Bushing	1846.00	feet	First Reading	3393.00	feet
Elevation Drill Floor	1844.00	feet	Depth Driller	3400.00	feet
Elevation Ground Level	1838.00	feet	Depth Logger	3396.00	feet

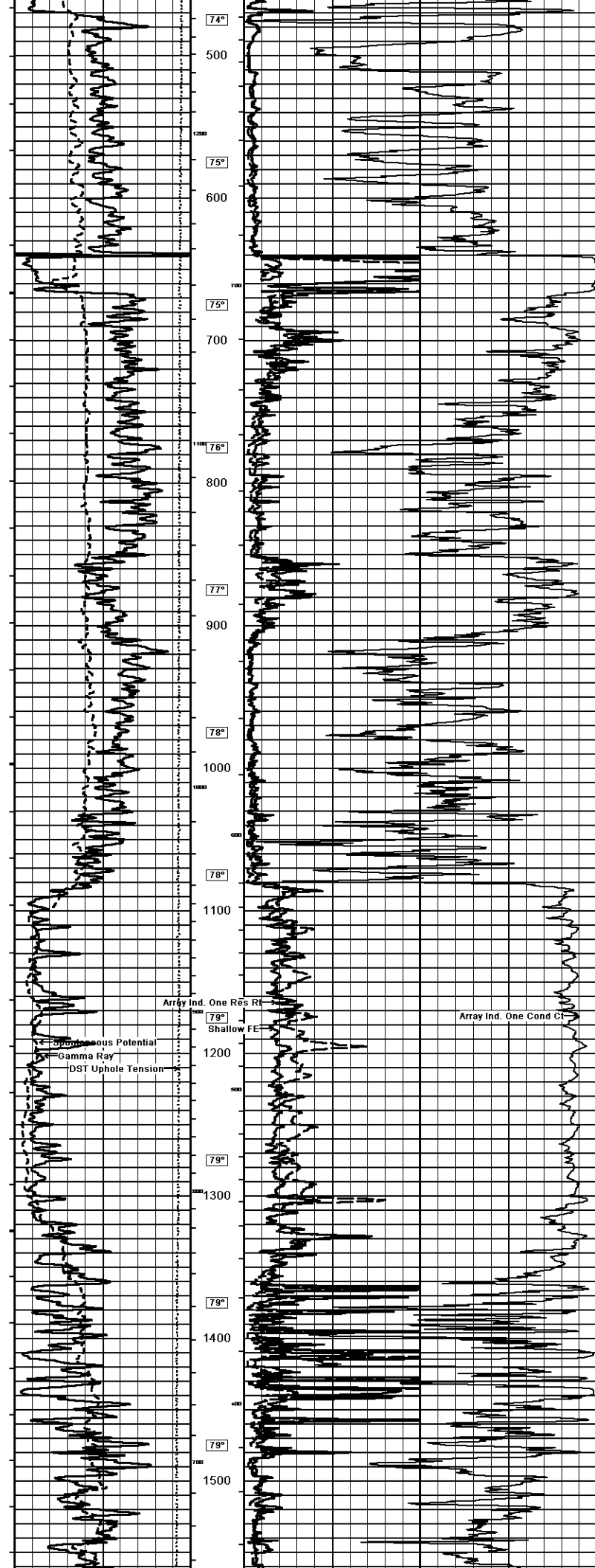


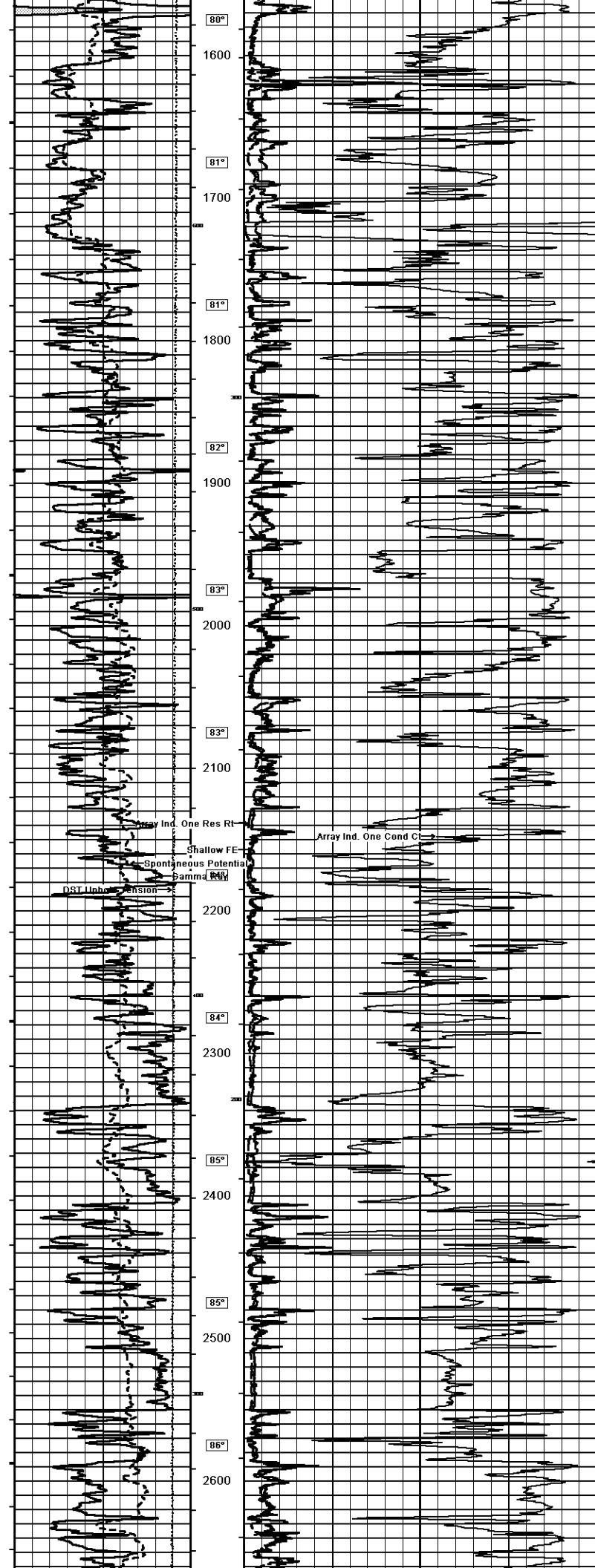
ARRAY INDUCTION SHALLOW FOCUSED ELECTRIC LOG

Weatherford®

Weatherford		ARRAY INDUCTION SHALLOW FOCUSED ELECTRIC LOG	
COMPANY	CMX, INC.		
WELL	KOZISEK #1-8		
FIELD	STOLTENBERG		
PROVINCE/COUNTY	ELLSWORTH		
COUNTRY/STATE	U.S.A. / KANSAS		
LOCATION	990' FSL & 1980' FEL		
SEC 8	TWP 18S R3E T0W	One Section	
Latitude	35.552344	MDNMRD	MML
Longitude	-97.052344		
Permanent Datum GL Elevation	1838 feet		
Log Measured From KB			KB 1846.00 DF 1844.00 GL 1838.00
Drilling Measured From KB @ 8 FEET			
Date	11-JAN-2016		
Run Number	ONE		
Service Order	4558-139737246		
Depth Driller	3400.00	feet	
Depth Logger	3396.00	feet	
First Reading	3393.00	feet	
Last Reading	348.00	feet	
Casing Driller	347.00	feet	
Casing Logger	348.00	feet	
Bit Size	7 8/5	inches	
Hole Fluid Type	CHEMICAL		
Density / Viscosity	9.00 lb/sq	43.00 CP	
PH / Fluid Loss	9.00	9.80 ml/30min	
Sample Source	FLOWLINE		
Rm @ Measured Temp	0.83 @ 75.0	ohm-m	
Rm @ Measured Temp	0.86 @ 75.0	ohm-m	
Rm @ Measured Temp	1.10 @ 75.0	ohm-m	
Source Rm / Rm	CALC	CALC	
Rm @ BHT	0.89 @ 90.0	ohm-m	
Time Since Circulation	4 HOURS		
Max Recorded Temp	90.00	deg F	
Equipment / Base	11306	DKC	
Recorded By	ADAM SILL		
Witnessed By	KENT LABLANC		









Filename: C:\minimus 15.03.5939\Logs\CMX Kozisek #1-8\CMX Kozisek #1-8_002.dta
System Versions: Logged with 15.03.5939 Plotted with 15.03.5939

Recorded on 12-JAN-2016 00:56

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1 INCH MAIN

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COMPANY		CMX, INC.			
WELL		KOZISEK #1-8			
FIELD		STOLTENBERG			
PROVINCE/COUNTY		ELLSWORTH			
COUNTRY/STATE		U.S.A. / KANSAS			
Elevation Kelly Bushing	1846.00	feet	First Reading	3393.00	feet
Elevation Drill Floor	1844.00	feet	Depth Driller	3400.00	feet
Elevation Ground Level	1838.00	feet	Depth Logger	3396.00	feet



ARRAY INDUCTION
SHALLOW FOCUSED
ELECTRIC LOG