

HALLIBURTON

ARRAY COMPENSATED TRUE RESISTIVITY LOG

COMPANY		OXY USA INC	
WELL		GARDEN CITY V-1	
FIELD		GARDEN CITY	
COUNTY		FINNEY	
STATE		KANSAS	
Permanent Datum		GL	
Log measured from		KB	
Drilling measured from		KB	
Date	25-Feb-12		
Run No.	ONE		
Depth - Driller	4960.00 ft		
Depth - Logger	4945.0 ft		
Bottom - Logged Interval	4935.0 ft		
Top - Logged Interval	1824.0 ft		
Casing - Driller	8.625 in @ 1830.0 ft		
Casing - Logger	1824.0 ft		
Bit Size	7.875 in		
Type Fluid in Hole	WATER BASED MUD		
Density	9.5 ppq	44.00	s/qt
PH	9.10 pH	9.6	cp/m
Source of Sample	FLOWLINE		
Rm @ Meas. Temperature	0.710 ohmm @ 75.00 degF	@	
Rmf @ Meas. Temperature	0.61 ohmm @ 75.00 degF	@	
Rmc @ Meas. Temperature	0.820 ohmm @ 75.00 degF	@	
Source Rmf	MEASURED	MEASURED	
Rm @ BHT	0.49 ohmm @ 112.0 degF	@	
Time Since Circulation	7.0 hr		
Time on Bottom	25-Feb-12 19:26		
Max. Rec. Temperature	112.0 degF @ 4945.0 ft	@	
Equipment	10782954	LIBERAL	
Recorded By	T. HYDE		
Witnessed By	A. GARNER	D. COOK	

COMPANY	OXY USA INC
WELL	GARDEN CITY V-1
FIELD	GARDEN CITY
COUNTY	FINNEY
STATE	KANSAS

API No.	15-055-22128
Location	2107 FSL 138 FWL

Other Services:
DSN/SDL
BSAT
MICRO

Sect.	27	Twp.	23S	Rge.	34W
-------	----	------	-----	------	-----

Elev. 2959.0 ft	Elev.: K.B.	2970.0 ft
11.0 ft above perm. Datum	D.F.	2969.0 ft
	G.L.	2959.0 ft

Fold here

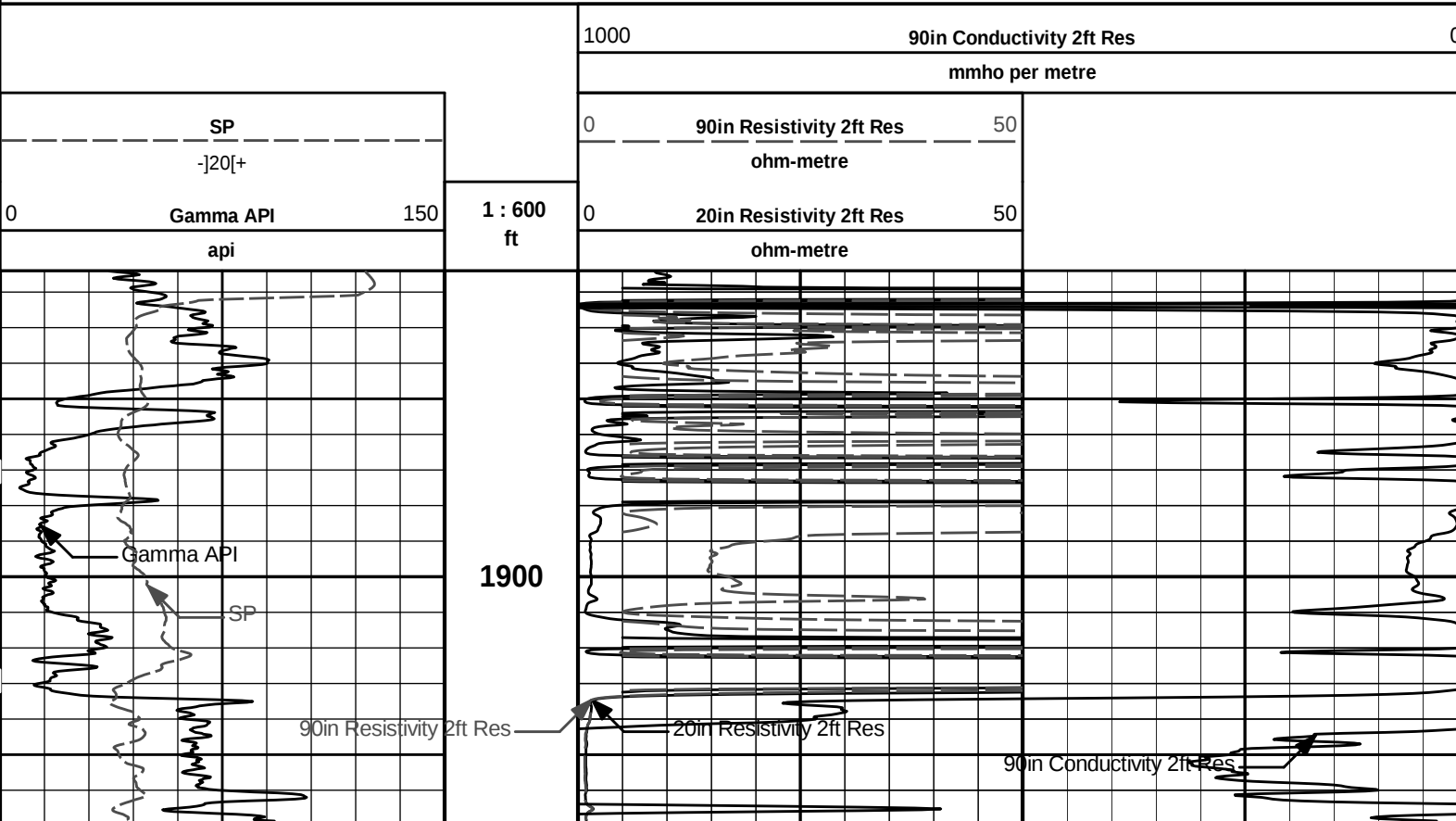
Service Ticket No.: 9309817						API Serial No.: 15-055-22128						PGM Version: WL INSITE R3.4.2 (Build 2)											
CHANGE IN MUD TYPE OR ADDITIONAL SAMPLE												RESISTIVITY SCALE CHANGES											
Date		Sample No.										Type Log		Depth		Scale Up Hole		Scale Down Hole					
Depth-Driller																							
Type Fluid in Hole																							
Density		Viscosity																					
Ph		Fluid Loss																					
Source of Sample												RESISTIVITY EQUIPMENT DATA											
Rm @ Meas. Temp				@				@				Run No.		Tool Type & No.		Pad Type		Tool Pos.		Other			
Rmf @ Meas. Temp.				@				@				ONE		ACRT		N/A		1.5" S.O.		N/A			
Rmc @ Meas. Temp.				@				@						I1256_S0784									
Source Rmf		Rmc										ONE		MICRO		RUBBER		ADJ		N/A			
Rm @ BHT				@				@						I066_M85803 _									
Rmf @ BHT				@				@						P45									
Rmc @ BHT				@				@															
EQUIPMENT DATA																							
GAMMA						ACOUSTIC						DENSITY						NEUTRON					
Run No.			ONE			Run No.			ONE			Run No.			ONE			Run No.			ONE		
Serial No.			10811258			Serial No.			10747683			Serial No.			I145_M85803_P45			Serial No.			10755066		
Model No.			GTET			Model No.			BSAT			Model No.			SDLT			Model No.			DSNT		
Diameter			3.625"			No. of Cent.			2			Diameter			4.5"			Diameter			3.625"		
Detector Model No.			T-102			Spacing			.5			Log Type			GAM-GAM			Log Type			NEU-NEU		
Type			SCINT									Source Type			Cs137			Source Type			Am241Be		
Length			8"			LSA [Y/N]			YES			Serial No.			5073GW			Serial No.			DSN-436		
Distance to Source			10'			FWDA [Y/N]			YES			Strength			1.5Ci			Strength			15Ci		

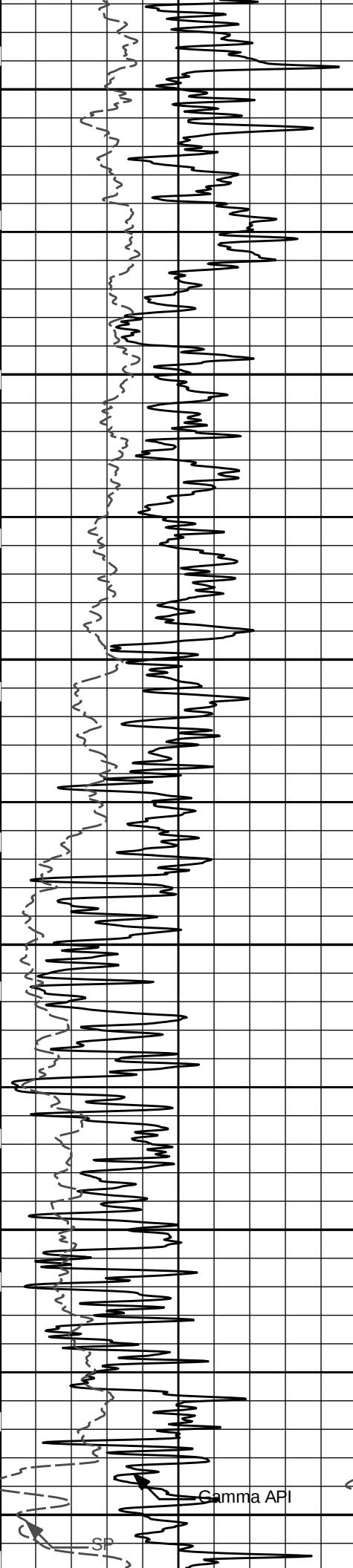
GENERAL			GAMMA		ACOUSTIC		DENSITY		NEUTRON					
Run	Depth		Speed	Scale		Scale		Matrix	Scale		Matrix	Scale		Matrix
No.	From	To	ft/min	L	R	L	R		L	R		L	R	
ONE	4945	1824	REC	0	150	30	-10	47.6	30	-10	2.71	30	-10	LIME
DIRECTIONAL INFORMATION														
Maximum Deviation @								KOP @						
Remarks:														
ACRT, BSAT, SDL, MICRO, DSN, GR RUN IN COMBINATION														
ANNULAR HOLE VOLUME CALCULATED FOR 5.5 INCH CASING														
CHLORIDES 7000 PPM														
LCM 1 LB/BBL														
TODAY'S CREW A. VAQUERO B. TERRELL														
THANK YOU FOR CHOOSING HALLIBURTON ENERGY SERVICES LIBERAL, KS 620-624-8123														
HALLIBURTON DOES NOT GUARANTEE THE ACCURACY OF ANY INTERPRETATION OF THE LOG DATA, CONVERSION OF LOG DATA TO PHYSICAL ROCK PARAMETERS OR RECOMMENDATIONS WHICH MAY BE GIVEN BY HALLIBURTON PERSONNEL OR WHICH APPEAR ON THE LOG OR IN ANY OTHER FORM. ANY USER OF SUCH DATA, INTERPRETATIONS, CONVERSIONS, OR RECOMMENDATIONS AGREES THAT HALLIBURTON IS NOT RESPONSIBLE EXCEPT WHERE DUE TO GROSS NEGLIGENCE OR WILLFUL MISCONDUCT, FOR ANY LOSS, DAMAGES, OR EXPENSES RESULTING FROM THE USE THEREOF.														
HALLIBURTON														

HALLIBURTON

Plot Time: 25-Feb-12 21:59:54
Plot Range: 1814 ft to 4951.33 ft
Data: GARDEN_CITY_V_1\Well Based\DAQ-0001-004\
Plot File: \\-LOCAL-I\GARDEN_CITY_V_1\0001 SP-GTET-DSN-SDL-BSAT-ACRT-CHIACRT\ACRT_2.lib

2 INCH MAIN LOG





2000

2100

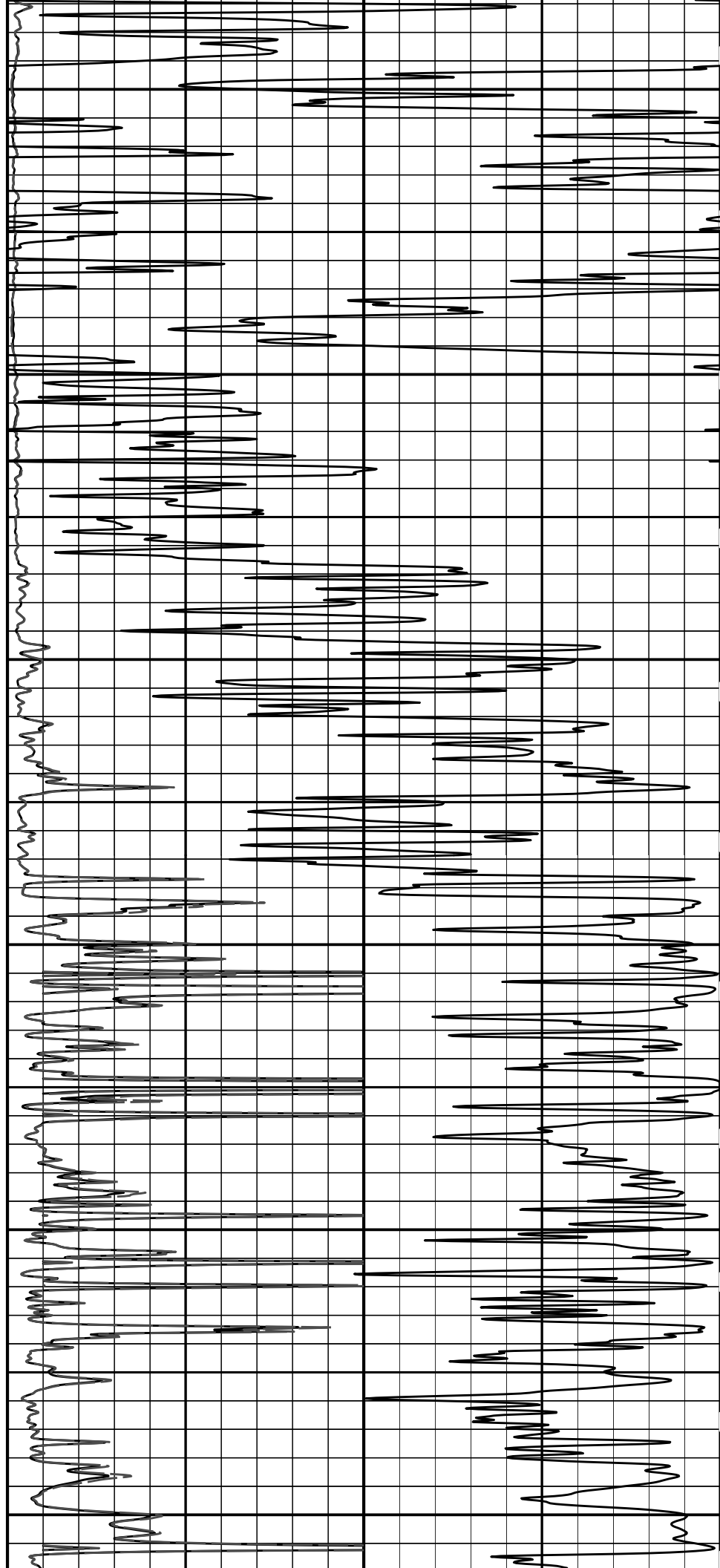
2200

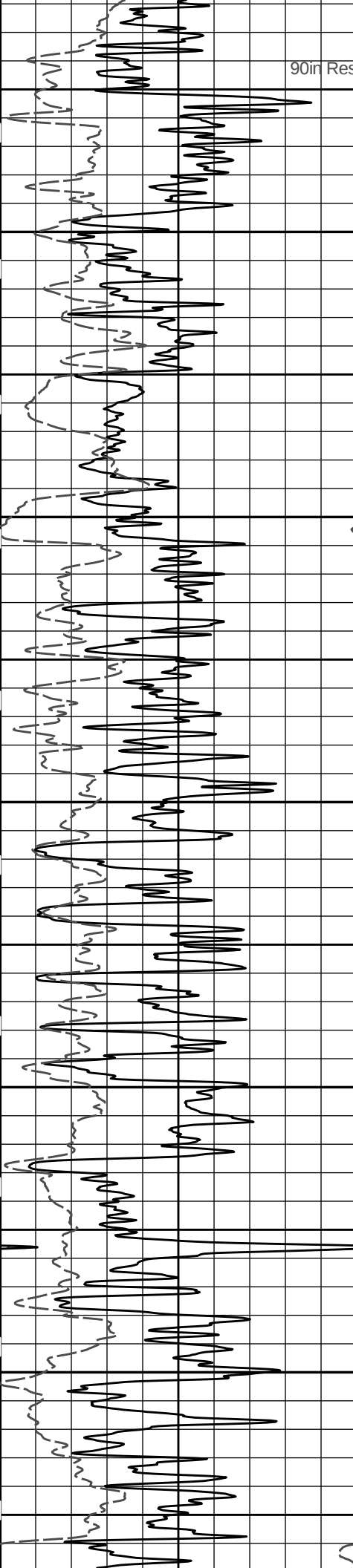
2300

2400

2500

Gamma API





90in Resistivity 2ft Res

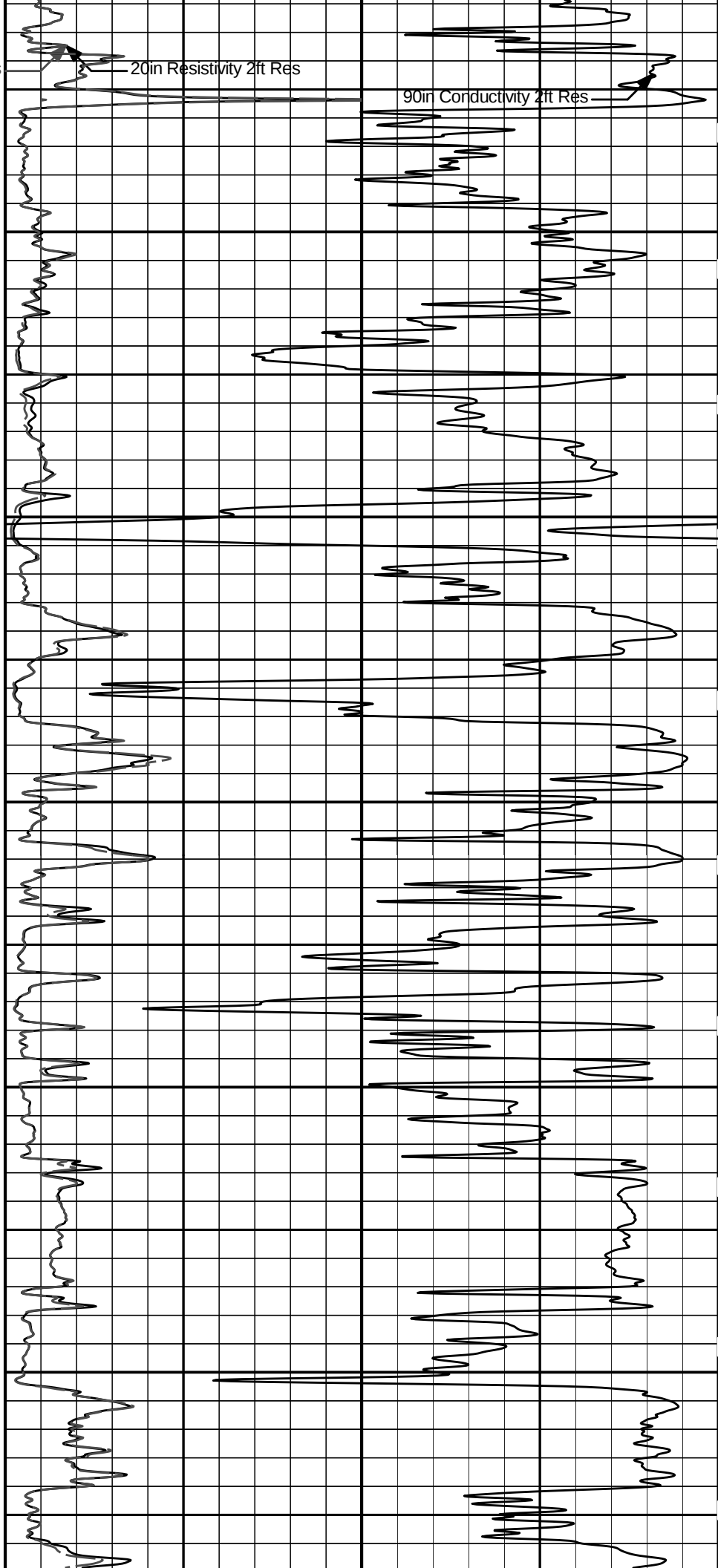
2600

2700

2800

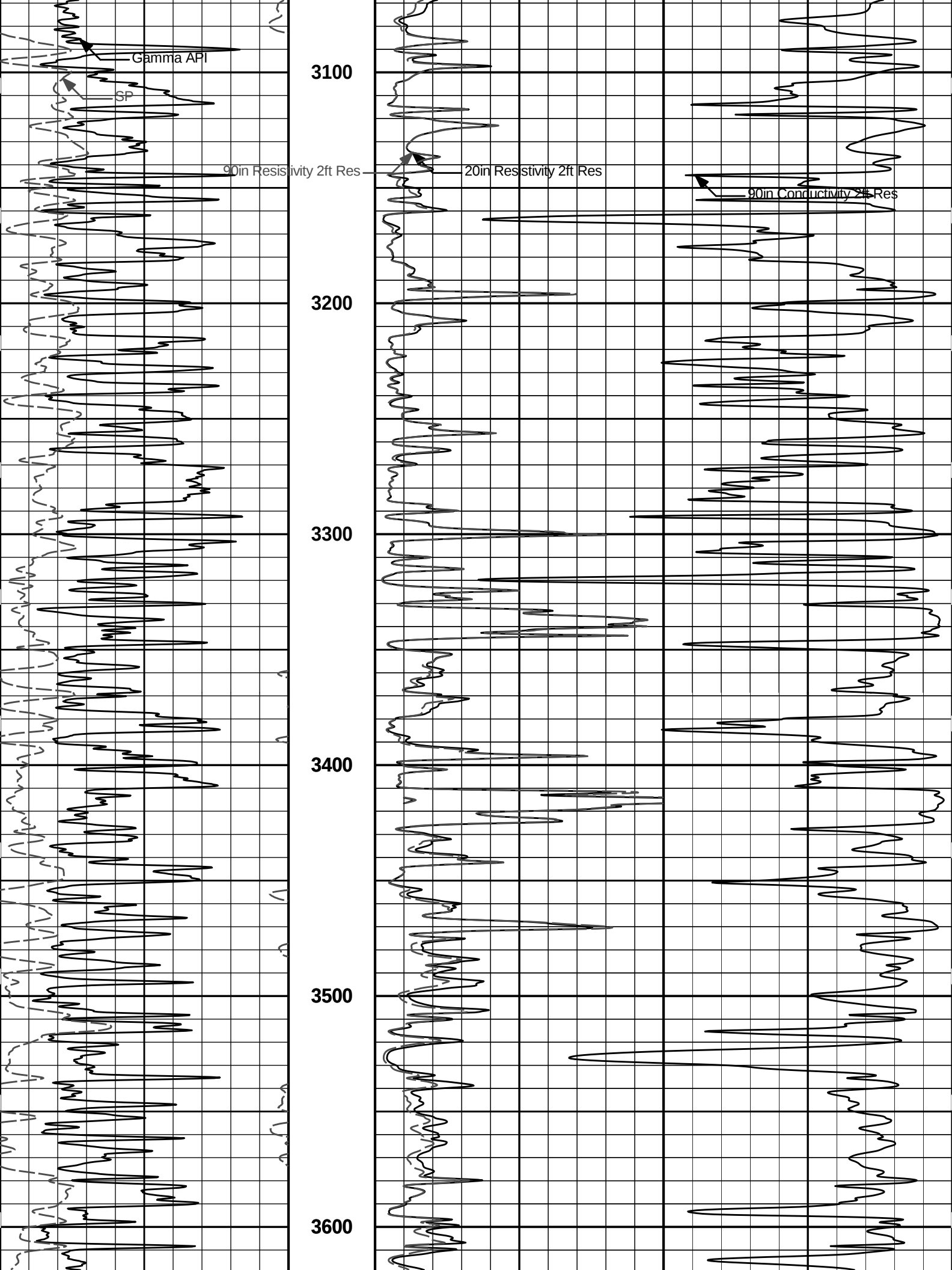
2900

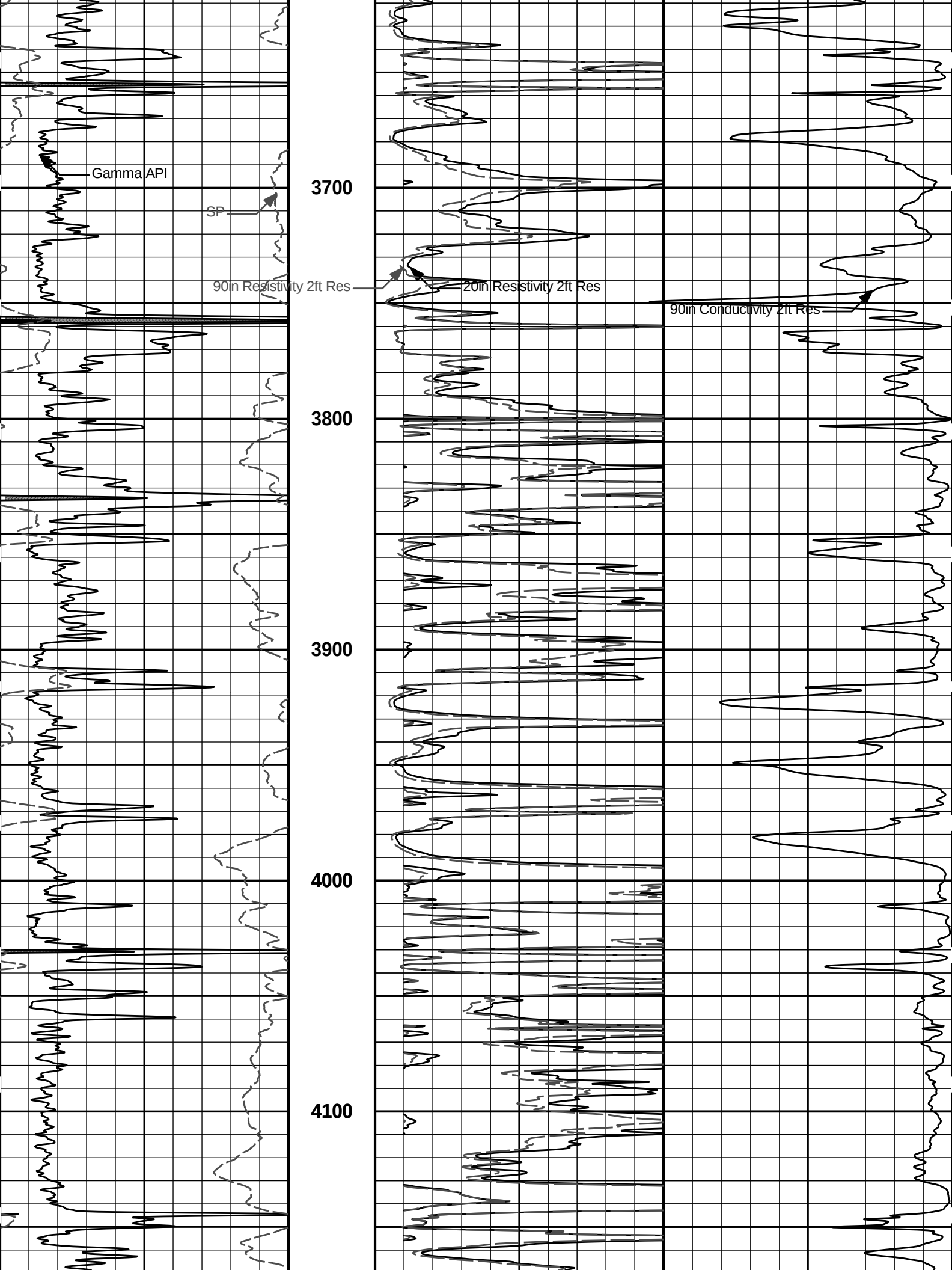
3000

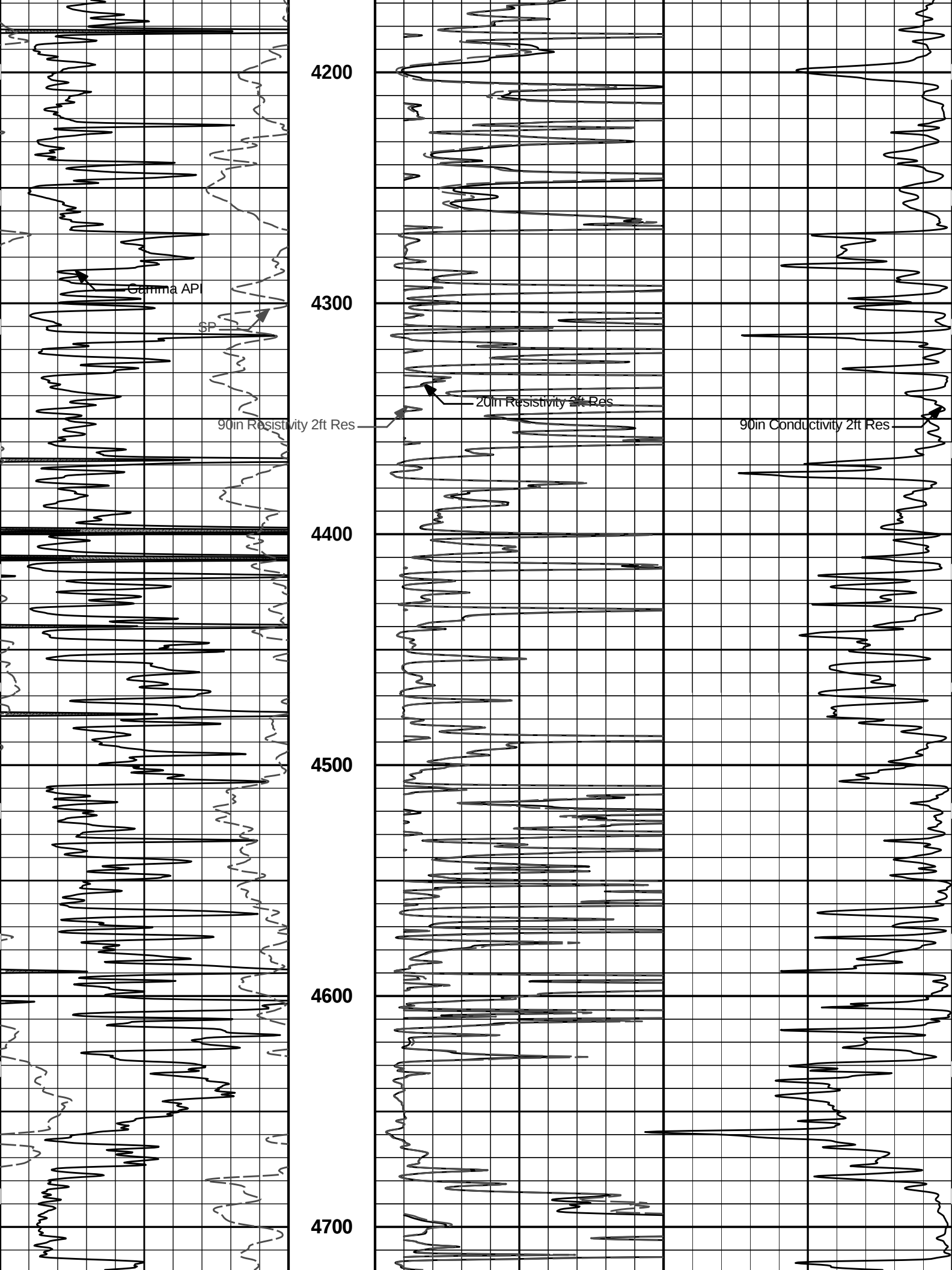


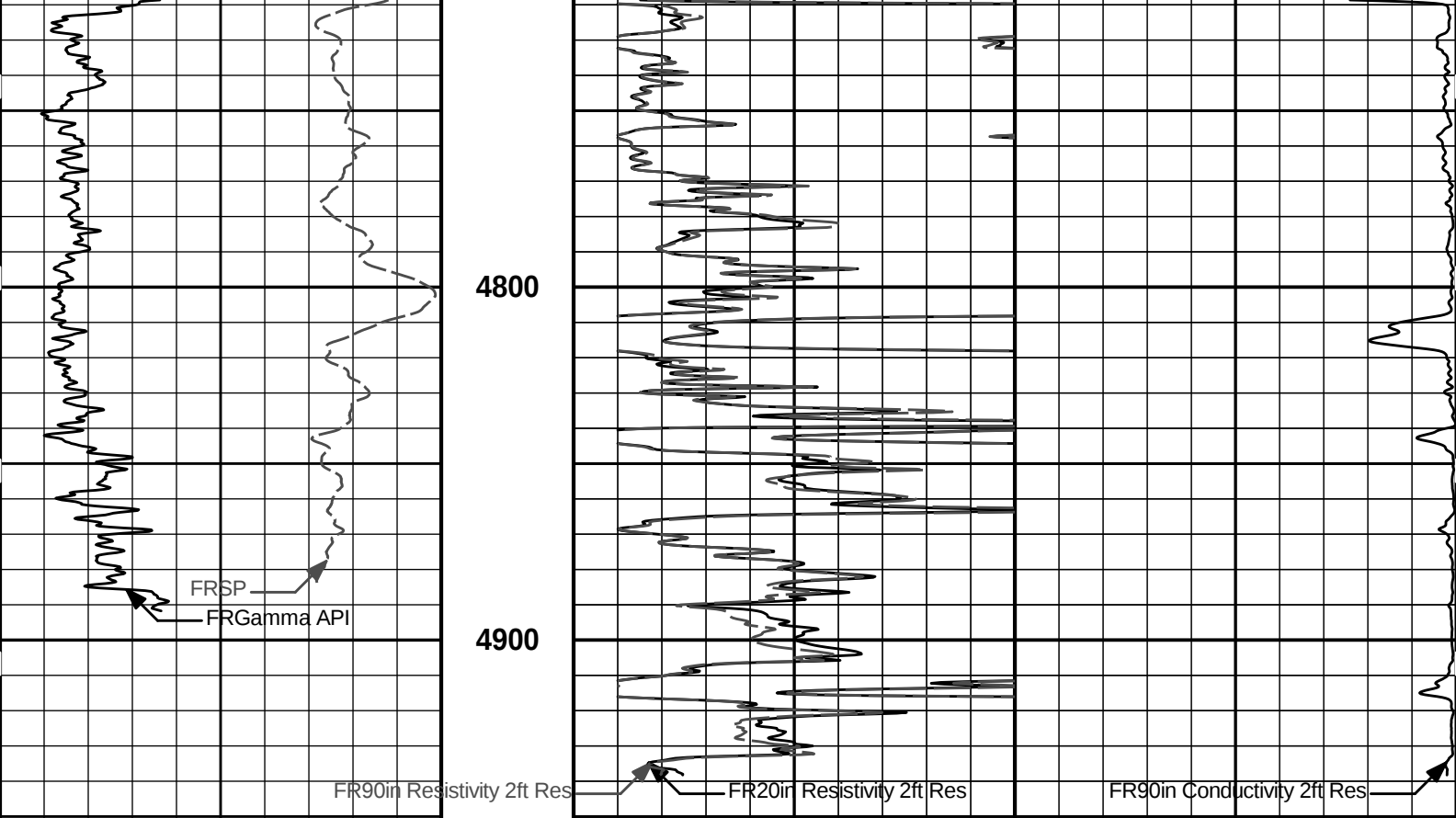
20in Resistivity 2ft Res

90in Conductivity 2ft Res









0	Gamma API	150	1 : 600 ft	0	20in Resistivity 2ft Res	50	
	api				ohm-metre		
	SP			0	90in Resistivity 2ft Res	50	
	-]20[+				ohm-metre		
				1000	90in Conductivity 2ft Res		0
					mmho per metre		

HALLIBURTON

Plot Time: 25-Feb-12 22:00:05
Plot Range: 1814 ft to 4951.33 ft
Data: GARDEN_CITY_V_1\Well Based\DAQ-0001-004\
Plot File: \\-LOCAL-IGARDEN_CITY_V_1\0001 SP-GTET-DSN-SDL-BSAT-ACRT-CH\ACRT\ACRT_2_lib

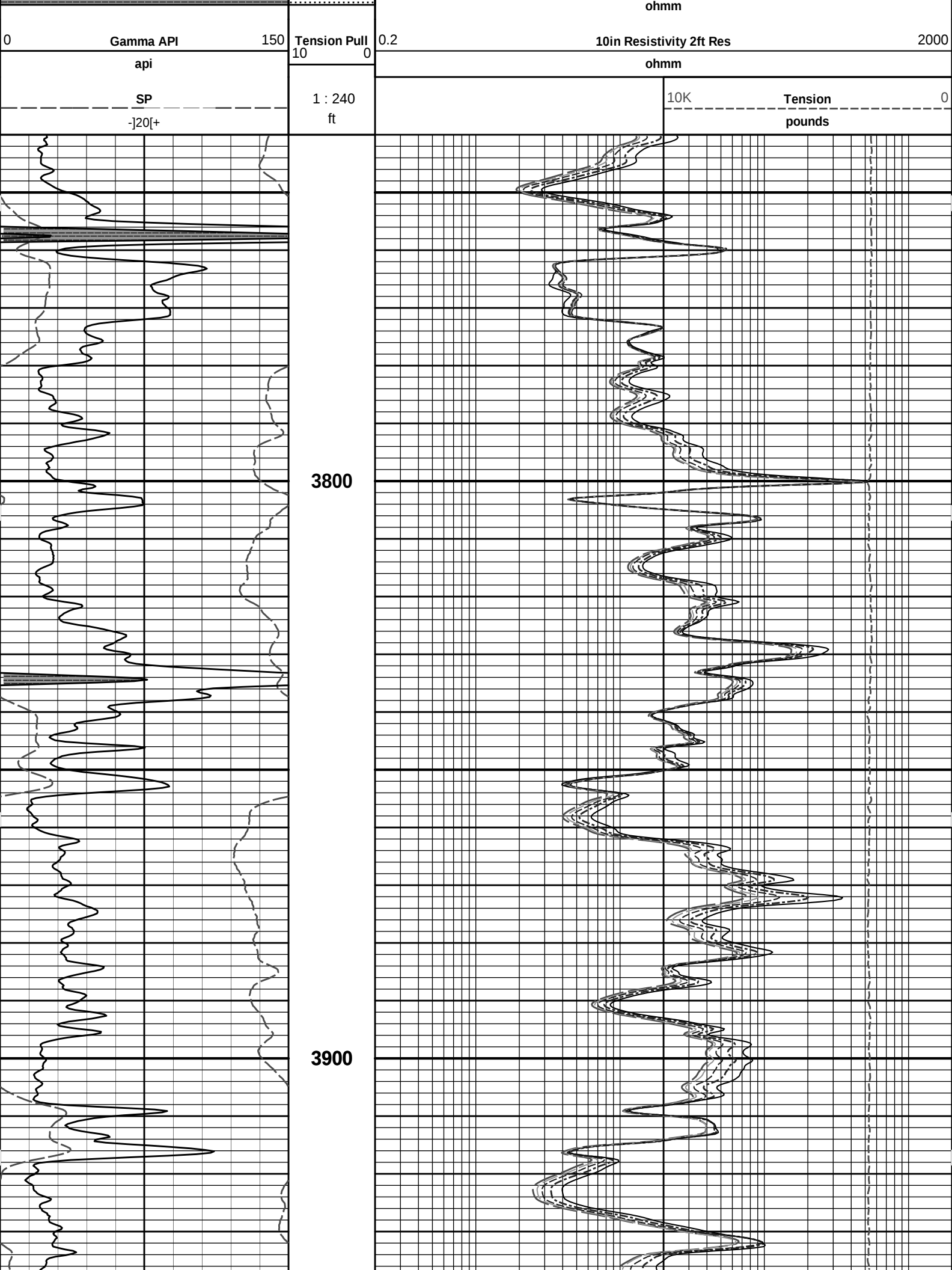
2 INCH MAIN LOG

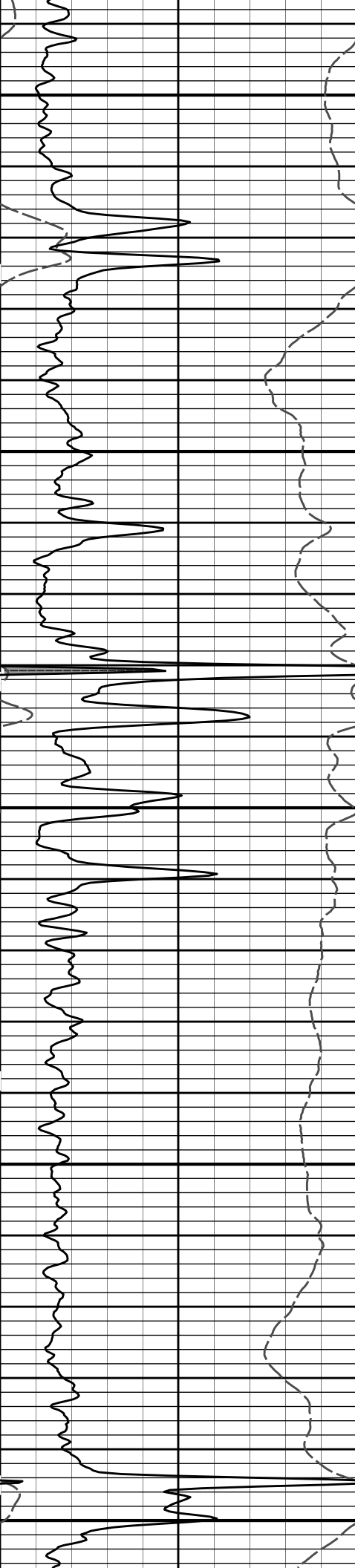
HALLIBURTON

Plot Time: 25-Feb-12 22:00:06
Plot Range: 3740 ft to 4951.33 ft
Data: GARDEN_CITY_V_1\Well Based\DAQ-0001-004\
Plot File: \\-LOCAL-IGARDEN_CITY_V_1\0001 SP-GTET-DSN-SDL-BSAT-ACRT-CH\ACRT\ACRT_5_main_lib

5 INCH MAIN LOG

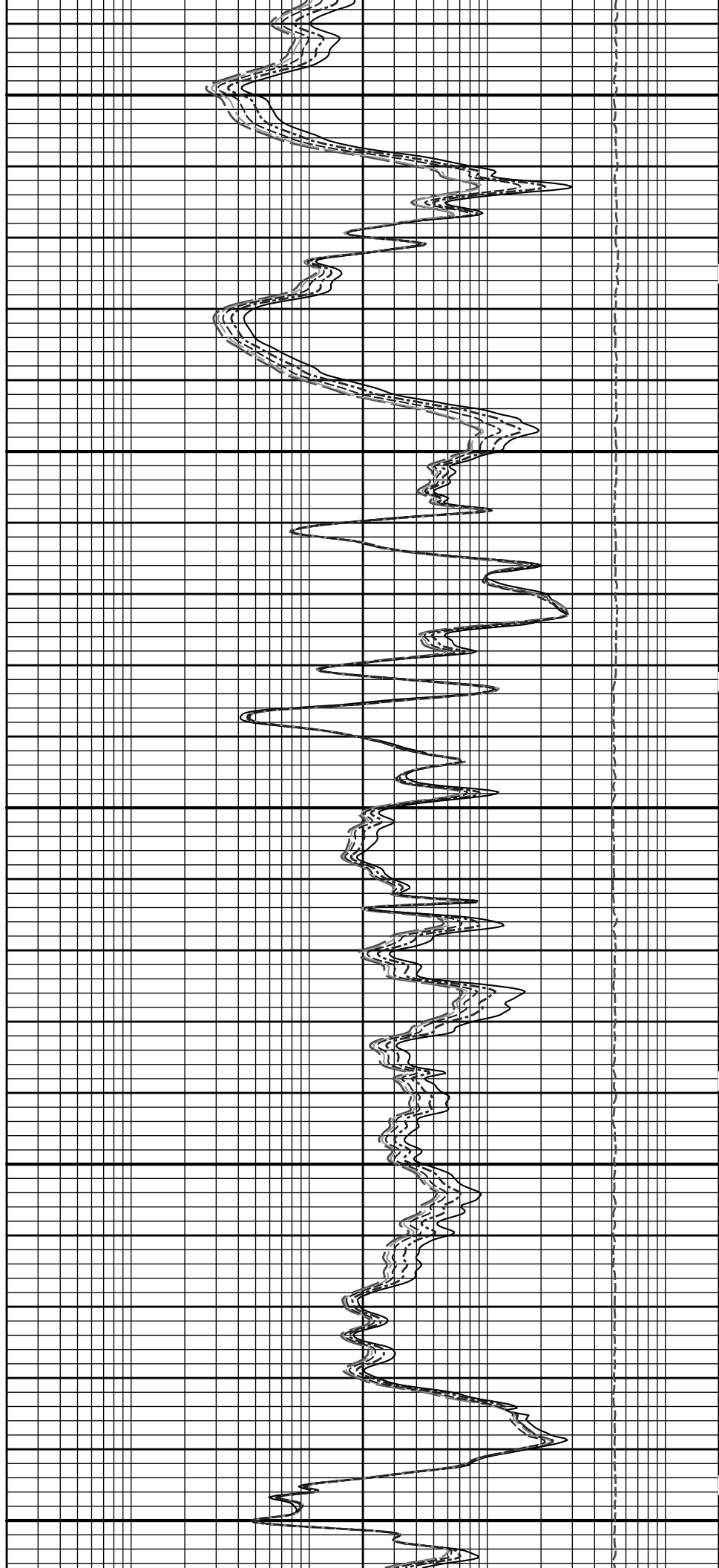
	0.2	90in Resistivity 2ft Res	2000
		ohmm	
	0.2	60in Resistivity 2ft Res	2000
		ohmm	
	0.2	30in Resistivity 2ft Res	2000
		ohm-metre	
SHALE	0.2	20in Resistivity 2ft Res	2000
Tension Pull			

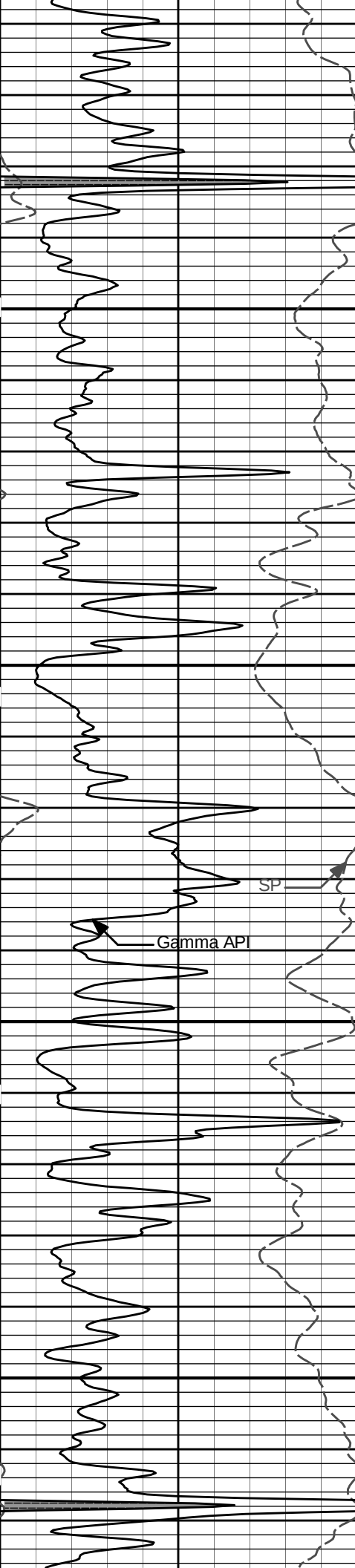




4000

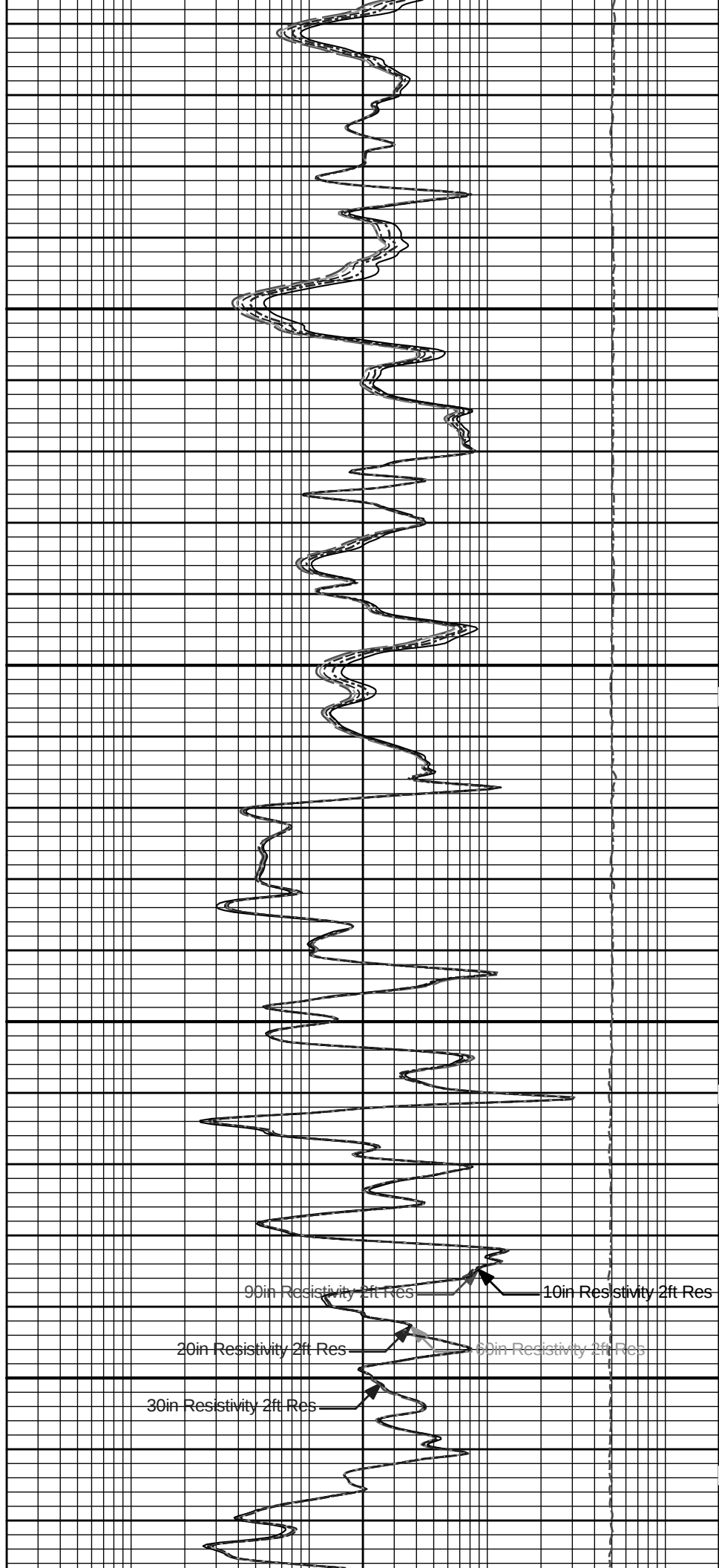
4100





4200

4300



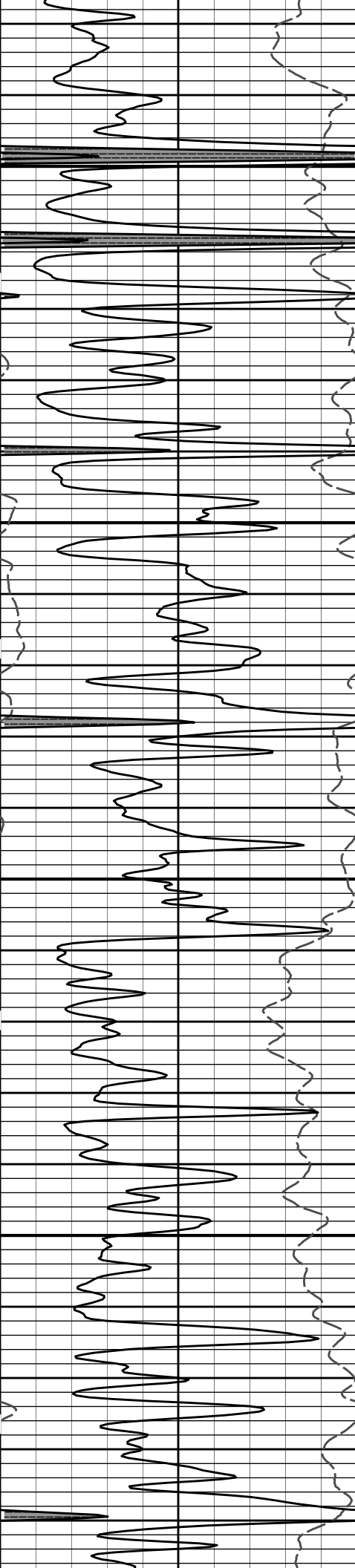
90in Resistivity 2ft Res

10in Resistivity 2ft Res

20in Resistivity 2ft Res

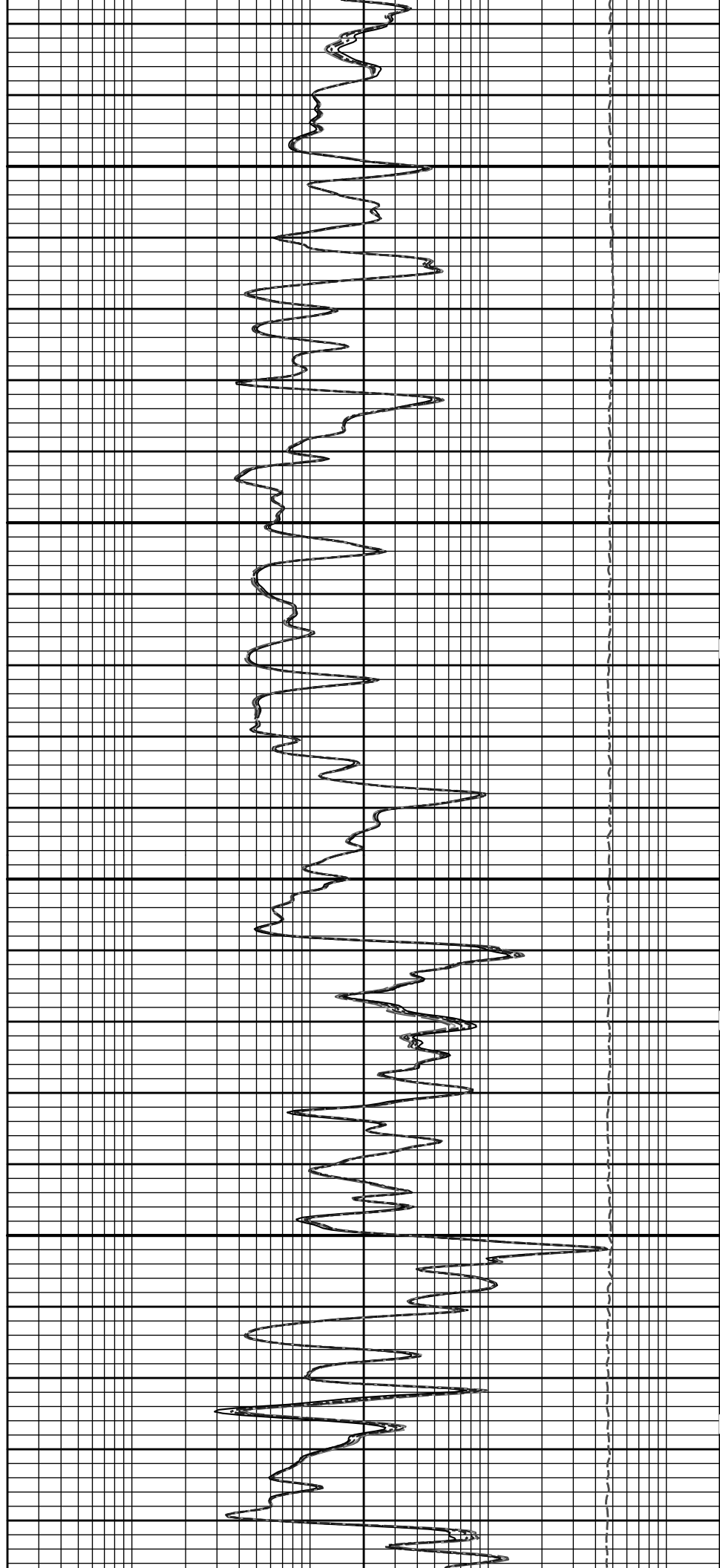
60in Resistivity 2ft Res

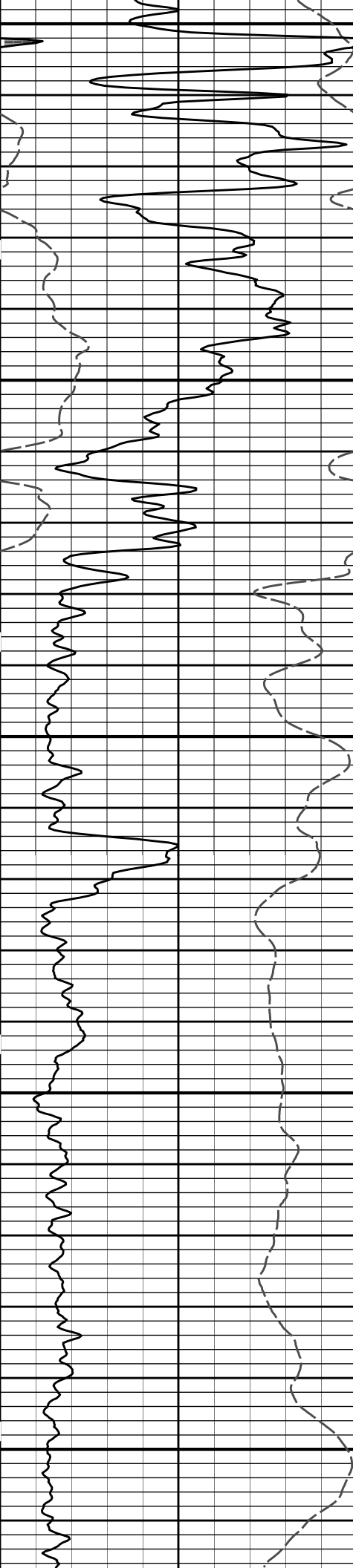
30in Resistivity 2ft Res



4400

4500

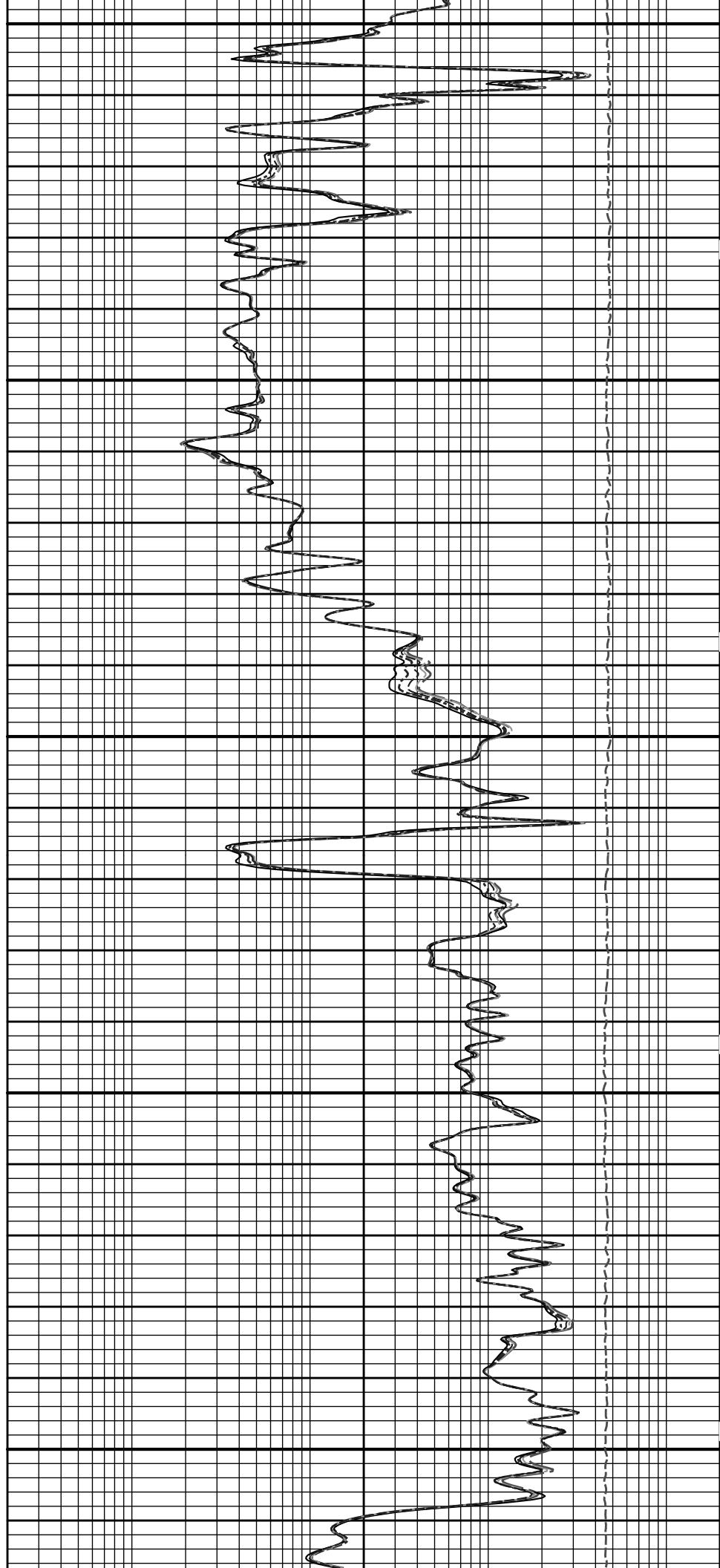


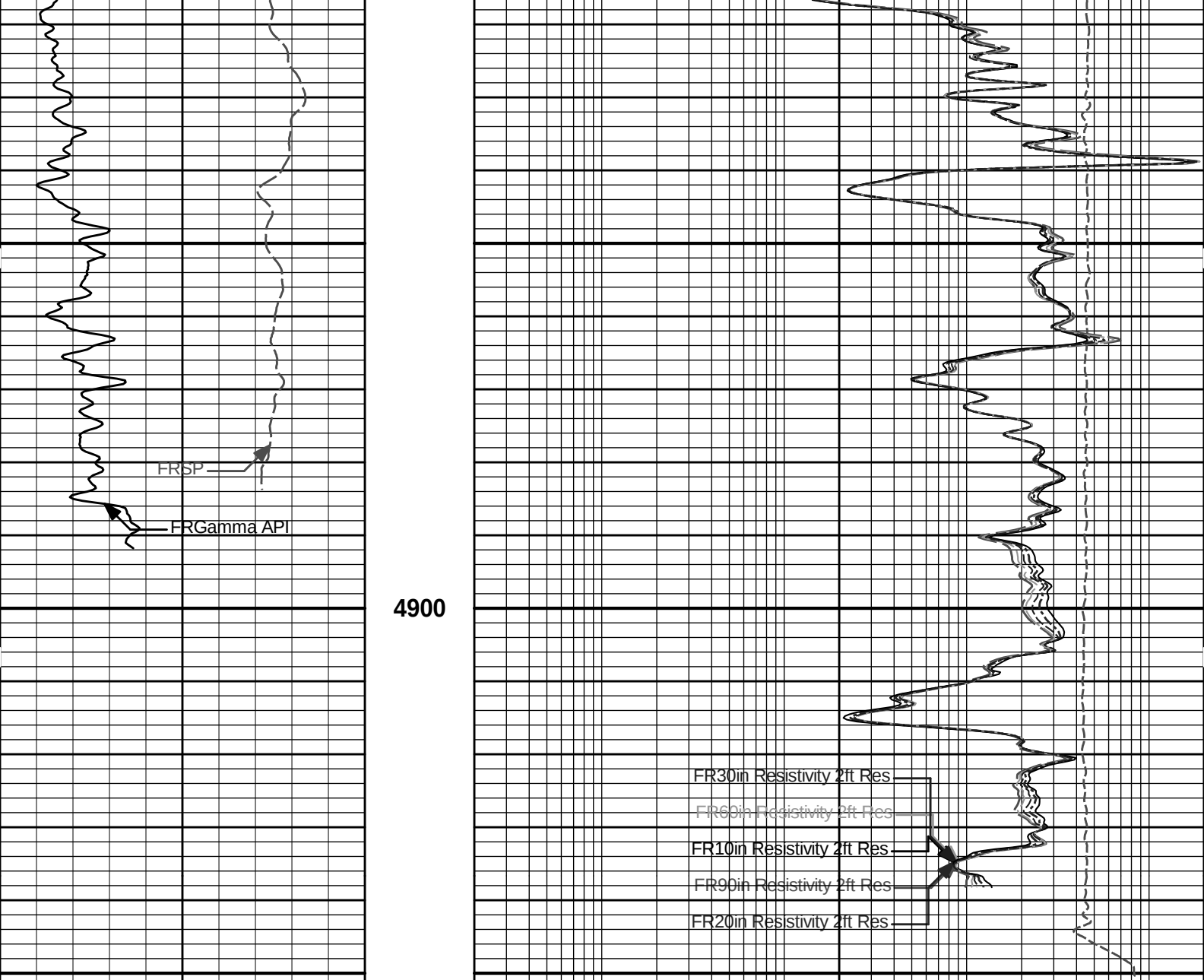


4600

4700

4800



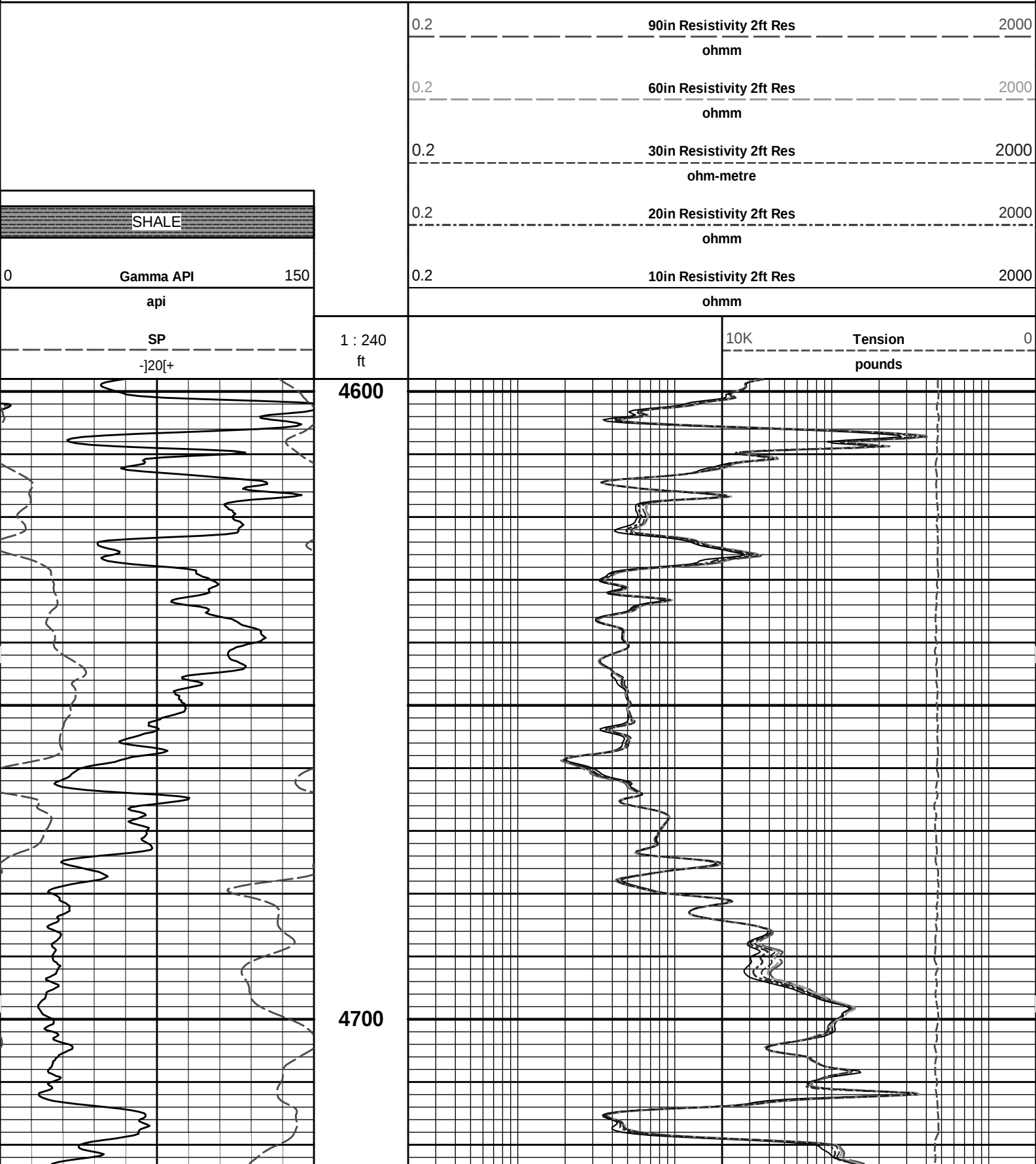


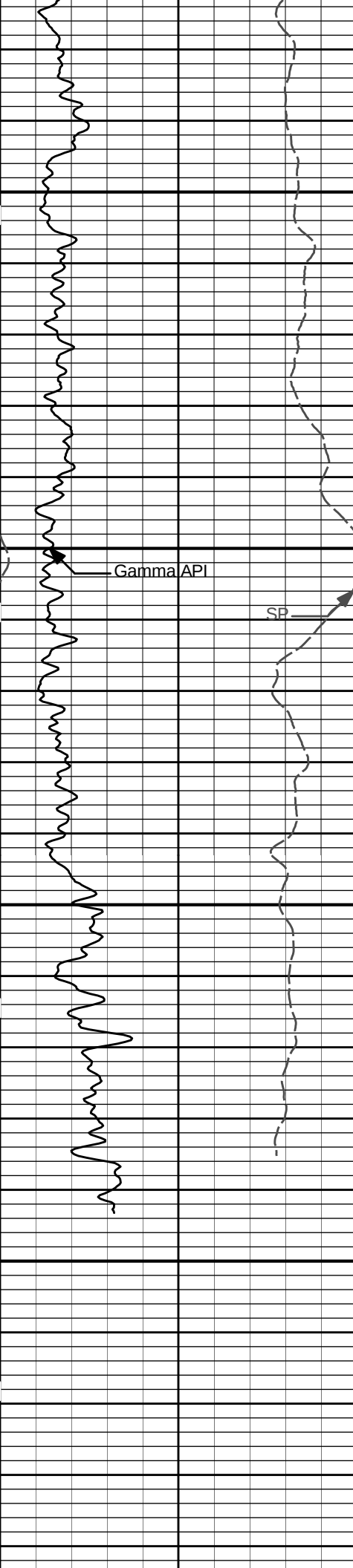
SP		1 : 240 ft	10K		Tension	0
-]20[+			pounds			
0	Gamma API	150	Tension Pull	0.2	10in Resistivity 2ft Res	2000
	api				ohmm	
SHALE		Tension Pull	0.2	20in Resistivity 2ft Res	ohmm	2000
			0.2	30in Resistivity 2ft Res	ohm-metre	2000
			0.2	60in Resistivity 2ft Res	ohmm	2000
			0.2	90in Resistivity 2ft Res	ohmm	2000

HALLIBURTON

Plot Time: 25-Feb-12 22:00:09
Plot Range: 4598 ft to 4952.75 ft
Data: GARDEN_CITY_V_1\Well Based\DAQ-0001-003\
Plot File: \\LOCAL-IGARDEN_CITY_V_1\0001 SP-GTET-DSN-SDL-BSAT-ACRT-CHI\ACRT\ACRT_5_repeat.lib

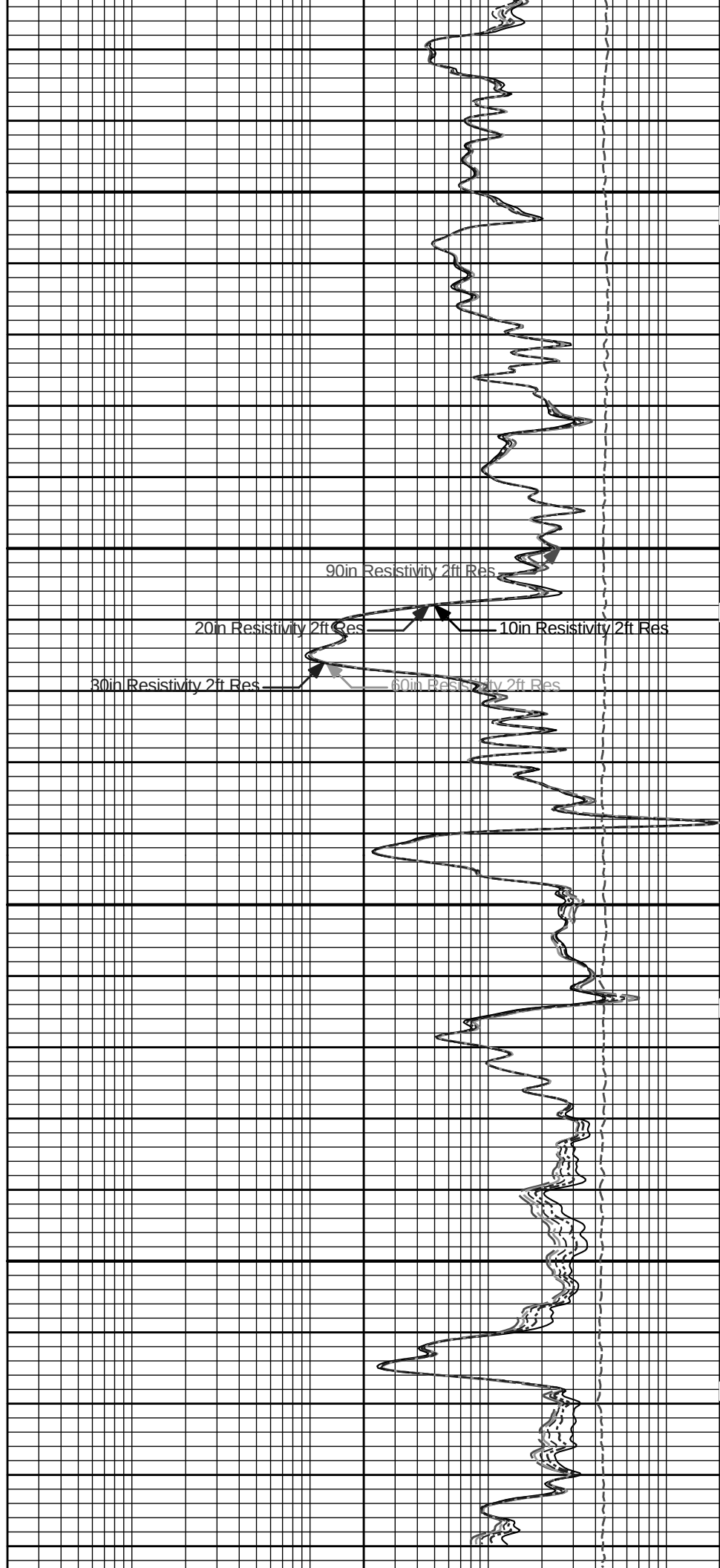
REPEAT SECTION





4800

4900



																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					</
--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	----

HALLIBURTON

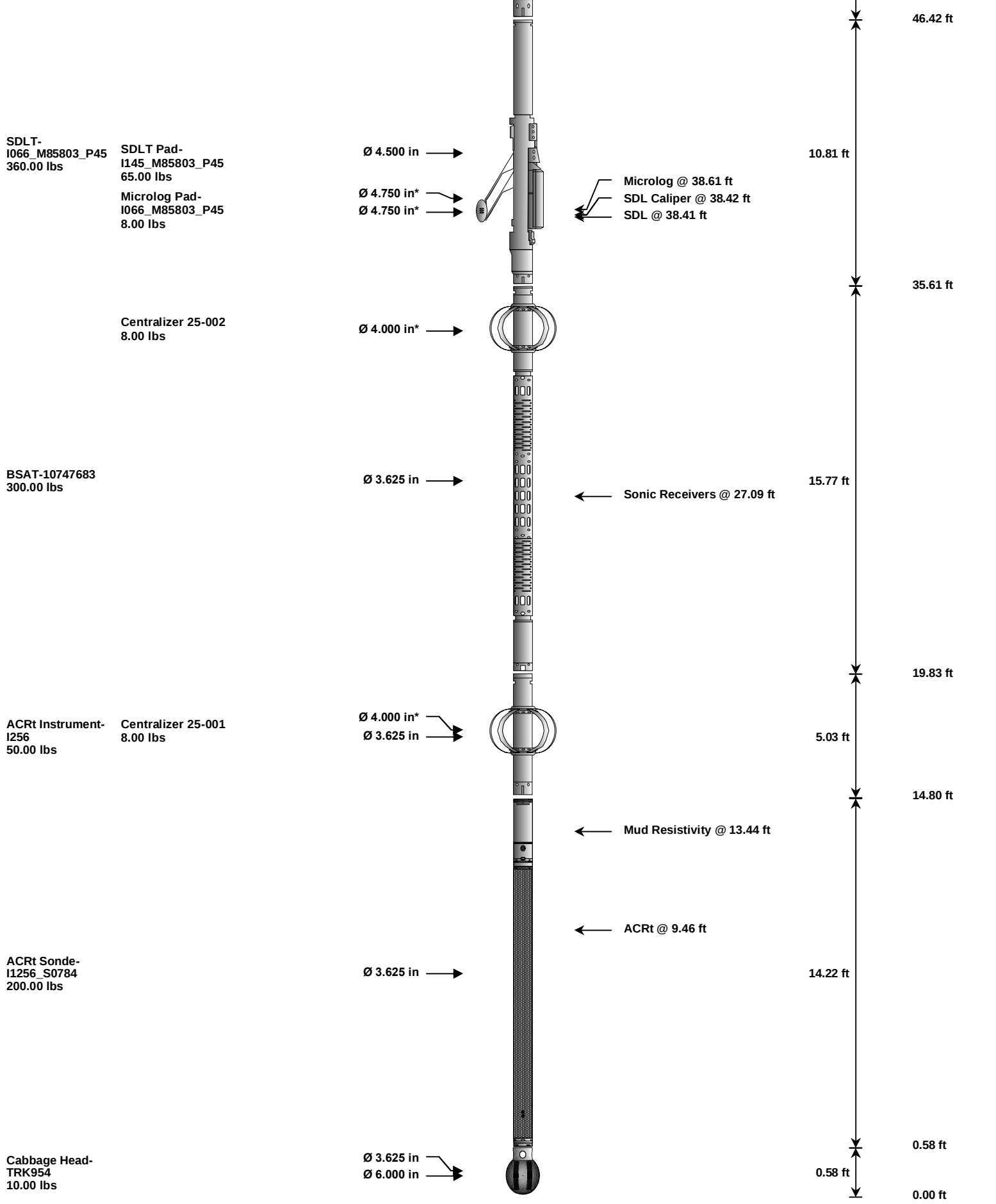
Plot Time: 25-Feb-12 22:00:13
Plot Range: 4598 ft to 4952.75 ft
Data: GARDEN_CITY_V_1\Well Based\DAQ-0001-003\
Plot File: \\-LOCAL-IGARDEN_CITY_V_1\0001 SP-GTET-DSN-SDL-BSAT-ACRT-CH\ACRT\ACRT_5_repeat.lib

REPEAT SECTION

HALLIBURTON

TOOL STRING DIAGRAM REPORT

Description	Overbody Description	O.D.	Diagram	Sensors @ Delays	Length	Accumulated Length
Cable Head- PROT01 30.00 lbs		Ø 3.625 in →			1.92 ft	70.28 ft
SP Sub-PROT01 60.00 lbs		Ø 3.625 in →		← SP @ 66.59 ft	3.74 ft	68.36 ft
						64.63 ft
GTET-10811258 165.00 lbs		Ø 3.625 in →		← GammaRay @ 58.56 ft	8.52 ft	
						56.11 ft
DSN Decentralizer- 10735145 6.60 lbs		Ø 5.000 in* →				
DSNT-10755066 174.00 lbs		Ø 3.625 in →		← DSN Far @ 49.17 ft ← DSN Near @ 48.42 ft	9.69 ft	



Mnemonic		Tool Name	Serial Number	Weight (lbs)	Length (ft)	Accumulated Length (ft)	Max.Log. Speed (fpm)
CH	Standard OH Cable Head		PROT01	30.00	1.92	68.36	300.00
SP	SP Sub		PROT01	60.00	3.74	64.63	300.00
GTET	Gamma Telemetry Tool		10811258	165.00	8.52	56.11	60.00
DSNT	Dual Spaced Neutron		10755066	174.00	9.69	46.42	60.00
DSNT	DSN Decentralizer		10735115	6.60	5.13	40.75	300.00

DCNT	DSN Decentralizer	I0735145	6.60	5.13	*	49.75	300.00
SDLT	Spectral Density Tool	I066_M85803_P45	360.00	10.81		35.61	60.00
MICP	Microlog Pad	I066_M85803_P45	8.00	1.00	*	38.11	60.00
SDLP	Density Insite Pad	I145_M85803_P45	65.00	2.55	*	37.82	60.00
BSAT	Borehole Sonic Array Tool	I0747683	300.00	15.77		19.83	60.00
OBCEN	Centralizer - 25 in. Overbody	002	8.00	2.08	*	32.76	300.00
ACRt	Array Compensated True Resistivity Instrument Section	I256	50.00	5.03		14.80	300.00
OBCEN	Centralizer - 25 in. Overbody	001	8.00	2.08	*	16.44	300.00
ACRt	Array Compensated True Resistivity	I1256_S0784	200.00	14.22		0.58	300.00
CBHD	Cabbage Head	TRK954	10.00	0.58		0.00	300.00
Total			1,444.60	70.28			
* Not included in Total Length and Length Accumulation.							
Data: GARDEN_CITY_V_1I0001 SP-GTET-DSN-SDL-BSAT-ACRT-CHIDLE							
Date: 25-Feb-12 17:30:03							

HALLIBURTON

CALIBRATION REPORT

NATURAL GAMMA RAY TOOL SHOP CALIBRATION				
Tool Name:	GTET - 10811258	Reference Calibration Date:	25-Oct-11 17:21:30	
Engineer:	C. HAVERKAMP	Calibration Date:	23-Jan-12 13:31:58	
Software Version:	WL INSITE R3.4.2 (Build 2)	Calibration Version:	1	
Calibrator Source S/N: TB-185				
Calibrator API Reference:228.00 api				
Equivalent Calibrator API Reference:232.0 api				
	Measurement	Measured	Calibrated	Units
	Background	43.3	42.9	api
	Background + Calibrator	277.3	274.9	api
	Calibrator	234.0	232.0	api

NATURAL GAMMA RAY TOOL FIELD CALIBRATION				
Tool Name:	GTET - 10811258	Reference Calibration Date:	23-Jan-12 13:31:58	
Engineer:	T. HYDE	Calibration Date:	25-Feb-12 17:40:09	
Software Version:	WL INSITE R3.4.2 (Build 2)	Calibration Version:	1	
Calibrator Source S/N: TB-185				
Calibrator API Reference:228.00 api				
Equivalent Calibrator API Reference:232.0 api				
Field Verification		Shop	Field	Units
Background		42.9	33.8	api
Background + Calibrator		274.9	263.8	api
Calibrator		232.0	230.0	api
Shop		Field	Difference	Tolerance
232.0		230.0	2.0	+/- 9.00

NATURAL GAMMA RAY TOOL POST CALIBRATION			
Tool Name:	GTET - 10811258	Reference Calibration Date:	25-Feb-12 17:40:09
Engineer:	T. HYDE	Calibration Date:	25-Feb-12 21:42:03
Software Version:	WL INSITE R3.4.2 (Build 2)	Calibration Version:	1
Calibrator Source S/N: TB-185			
Calibrator API Reference:228.00 api			
Calibrator API Reference:232.0 api			
Post Verification		Field	Post
			Units

Post Verification	Field	Post	Units
Background	33.8	28.3	api
Background + Calibrator	263.8	256.6	api
Calibrator	230.0	228.2	api

Shop	Field	Post	Difference	Tolerance
232.0	230.0	228.2	1.8	+/- 9.00

DUAL SPACED NEUTRON SHOP CALIBRATION

Tool Name:	DSNT - 10755066	Reference Calibration Date:	06-Nov-11 14:36:25
Engineer:	C. MARLOWE	Calibration Date:	26-Jan-12 13:31:41
Software Version:	WL INSITE R3.4.2 (Build 2)	Calibration Version:	1

Logging Source S/N: DSN-436

Tank Serial Number: 105060

Reference value assigned to Tank: 51.680

Snow Block S/N: TRK_10782954

Calibration Tank Water Temperature: 62 degF

Min. Tool Housing Outside Diameter: 3.615 in

CALIBRATION CONSTANTS			
Measurement	Prev. Value	New Value	Control Limit On New Value
Gain:	0.949	0.945	0.900 - 1.100

WATER TANK SUMMARY (Horizontal Water Tank)				
Measurement	Current Reading (Previous Coef.)	Calibrated (New Coef.)	Change	Control Limit On Change
Porosity (decp):	0.2115	0.2103	0.0012	+/- 0.0020
Calibrated Ratio:	9.75	9.70	0.041	+/- 0.050

VERIFIER		
Measurement	Value	Control Limit
Snow-Block Porosity (decp):	0.0560	0.02000 - 0.09000

PASS/FAIL SUMMARY	
Background Check:	Passed
Gain-Range Check:	Passed
Snow-Block Check:	Passed

DUAL SPACED NEUTRON FIELD CALIBRATION

Tool Name:	DSNT - 10755066	Reference Calibration Date:	26-Jan-12 13:31:41
Engineer:	T. HYDE	Calibration Date:	25-Feb-12 17:45:57
Software Version:	WL INSITE R3.4.2 (Build 2)	Calibration Version:	1

Logging Source S/N: DSN-436

Snow Block S/N: TRK_10782954

NEUTRON FIELD-CHECK SUMMARY				
	Shop	Field	Difference	Control Limit On Change
Snow-Block Porosity (decp):	0.0560	0.0582	0.0022	+/- 0.0150

PASS/FAIL SUMMARY	
Block Change Check:	Passed
Snow Block Stat Check:	Passed

Temperature Check:

Passed

DUAL SPACED NEUTRON POST CALIBRATION

Tool Name: DSNT - 10755066

Reference Calibration Date: 25-Feb-12 17:45:57

Engineer: T. HYDE

Calibration Date: 25-Feb-12 21:48:15

Software Version: WL INSITE R3.4.2 (Build 2)

Calibration Version: 1

Logging Source S/N: DSN-436

Snow Block S/N: TRK_10782954

NEUTRON POST-CHECK SUMMARY

	Field Value	Post Value	Difference	Control Limit On Change
Snow-Block Porosity (decip):	0.0582	0.0576	-0.0005	+/- 0.0150

PASS/FAIL SUMMARY

Block Change Check:	Passed
Snow Block Stat Check:	Passed
Temperature Check:	Passed

DENSITY CALIPER SHOP CALIBRATION

Tool Name: SDLT - I066_M85803_P45

Reference Calibration Date: 09-Nov-11 16:14:16

Engineer: C. MARLOWE

Calibration Date: 31-Jan-12 19:54:02

Software Version: WL INSITE R3.4.2 (Build 2)

Calibration Version: 1

CALIBRATION COEFFICIENTS

Measurement	Previous Value	New Value	Control Limit On New Value
Pad Offset	-5583.09	-5136.31	-7000.00 - -1000.00
Pad Gain	0.0003781	0.0003673	0.000200 - 0.000600
Arm Offset	-1197.87	-1566.02	-5000.00 - 3000.00
Arm Gain	0.0004938	0.0004838	0.000300 - 0.000700
Arm Power	-0.000003039	-0.000002176	-0.000010 - 0.000010

The ring diameter is computed from: DIAMETER = PAD EXTENSION + ARM EXTENSION + TOOL DIAMETER

Tool Diameter: 4.50 in

CALIBRATION RINGS

Measurement	Current Reading (Previous Coeff.)	Calibrated (New Coeff.)	Change	Control Limit On New Value
PAD EXTENSION:				
Small Ring (in)	1.89	2.00	0.11	+/- 0.20
Medium Ring (in)	3.69	3.75	0.06	+/- 0.20
RING DIAMETER:				
Small Ring (in)	6.54	6.50	-0.04	+/- 0.20
Medium Ring (in)	8.31	8.25	-0.06	+/- 0.20
Large Ring (in)	14.98	15.00	0.02	+/- 0.20

PASS/FAIL SUMMARY

Calibration-Coefficients Range Check:	Passed
Ring-Measurement Check:	Passed

PASS/FAIL SUMMARY

Calibration-Coefficients Range Check:	Passed
---------------------------------------	--------

SDLT CALIPER FIELD CALIBRATION

Tool Name: SDLT - I066_M85803_P45

Reference Calibration Date: 31-Jan-12 19:54:02

Engineer: T. HYDE

Calibration Date: 25-Feb-12 17:53:07

Software Version: WL INSITE R3.4.2 (Build 2)

Calibration Version: 1

Software Version: WL INSITE R3.4.2 (Build 2)	MEASURED CALIPER VALUES				Calibration Version: 1
	Measurement	Shop	Field	Change	Control Limit On New Value
	Pad Extension	3.75	3.70	-0.05	+/- 0.10
	Ring Diameter	8.25	8.11	-0.14	+/- 0.15
	PASS/FAIL SUMMARY				
	Pad Extension Check:			Passed	
	Diameter Check:			Passed	

SDLT CALIPER POST CALIBRATION					
Tool Name:	SDLT - I066_M85803_P45			Reference Calibration Date:	25-Feb-12 17:53:07
Engineer:	T. HYDE			Calibration Date:	25-Feb-12 21:55:38
Software Version:	WL INSITE R3.4.2 (Build 2)			Calibration Version:	1

	MEASURED CALIPER VALUES				
	Measurement	Field	Post	Change	Control Limit On New Value
	Pad Extension	3.70	3.70	-0.00	+/- 0.10
	Ring Diameter	8.11	7.97	-0.13	+/- 0.15
	PASS/FAIL SUMMARY				
	Pad Extension Check:			Passed	
	Diameter Check:			Passed	

ARRAY COMPENSATED TRUE RESISTIVITY SHOP CALIBRATION									
Tool Name:	ACRt Sonde - I1256_S0784				Reference Calibration Date:	03-Oct-11 10:37:13			
Engineer:	C. HAVERKAMP				Calibration Date:	19-Jan-12 15:58:26			
Software Version:	WL INSITE R3.4.2 (Build 2)				Calibration Version:	1			

TYPICAL GAIN RANGE									
Subarray	R12KHz			R36KHz			R72KHz		
	Lower	(mmho/m)	Upper	Lower	(mmho/m)	Upper	Lower	(mmho/m)	Upper
A1 (80")	0.95	1.0114	1.05	0.95	1.0118	1.05	0.95	1.0018	1.05
A2 (50")	0.95	1.0171	1.05	0.95	1.0184	1.05	0.95	1.0116	1.05
A3 (29")	0.95	1.0027	1.05	0.95	1.0033	1.05	0.95	0.9957	1.05
A4 (17")	0.95	1.0186	1.05	0.95	1.0175	1.05	0.95	1.0133	1.05
A5 (10")	N/A	N/A	N/A	0.95	0.9958	1.05	0.95	0.9913	1.05
A6 (6")	N/A	N/A	N/A	0.95	0.9830	1.05	0.95	0.9787	1.05

TYPICAL SONDE OFFSET RANGE									
Subarray	R12KHz			R36KHz			R72KHz		
	Lower	(mmho/m)	Upper	Lower	(mmho/m)	Upper	Lower	(mmho/m)	Upper
A1 (80")	-5	-0.430	2	-6	-3.728	-2	-8	-4.849	-2
A2 (50")	-7	-2.031	-1	-6	-3.570	-2	-7	-4.342	-2
A3 (29")	-27	-16.211	-9	-9	-4.525	-3	-7	-3.257	-1
A4 (17")	-180	-98.266	-60	-45	-32.488	-15	-39	-26.620	-13
A5 (10")	N/A	N/A	N/A	-150	-96.757	-50	-80	-48.362	-10
A6 (6")	N/A	N/A	N/A	175	301.957	525	90	159.522	270

TRANSMITTER CURRENT GAIN				R-MUD VERIFICATION			
Signal	Lower	R	Upper	Signal	Lower (ohm-m)	Measured (ohm-m)	Upper (ohm-m)

12K	0.6	0.8379	1.3	Mud Cell	0.95	1.002	1.05
36K	1.0	1.1691	2.0				
72K	1.0	1.4954	2.0				
SPECTRAL DENSITY SHOP CALIBRATION							
Tool Name:	SDLT Pad - I145_M85803_P45			Reference Calibration Date:	17-Dec-11 07:41:10		
Engineer:	C. HAVERKAMP			Calibration Date:	23-Jan-12 14:46:25		
Software Version:	WL INSITE R3.4.2 (Build 2)			Calibration Version:	1		
Logging Source S/N: 5073GW							
Aluminum Block S/N: 63061				Density: 2.591g/cc		Pe: 3.170	
Magnesium Block S/N: 63393				Density: 1.690g/cc		Pe: 2.594	
DENSITY CALIBRATION SUMMARY							
Measurement		Previous Value	New Value	Control Limit			
Near Bar Gain		0.9729	0.9638	0.90 - 1.10			
Near Dens Gain		0.9692	0.9694	0.90 - 1.10			
Near Peak Gain		0.9717	0.9714	0.90 - 1.10			
Near Lith Gain		0.9336	0.9507	0.90 - 1.10			
Far Bar Gain		0.9864	0.9884	0.90 - 1.10			
Far Dens Gain		0.9773	0.9795	0.90 - 1.10			
Far Peak Gain		0.9717	0.9754	0.90 - 1.10			
Far Lith Gain		0.9498	0.9495	0.90 - 1.10			
Near Bar Offset		0.4649	0.5546	NONE			
Near Dens Offset		0.4626	0.4701	NONE			
Near Peak Offset		0.4060	0.4173	NONE			
Near Lith Offset		0.6865	0.5566	NONE			
Far Bar Offset		0.2464	0.2316	NONE			
Far Dens Offset		0.3033	0.2881	NONE			
Far Peak Offset		0.3146	0.2860	NONE			
Far Lith Offset		0.4166	0.4258	NONE			
Near Bar Background		1007.93	1005.32	700 - 1450			
Near Dens Background		332.14	333.52	230 - 480			
Near Peak Background		145.51	145.48	100 - 210			
Near Lith Background		178.15	177.09	125 - 260			
Far Bar Background		518.29	514.45	450 - 900			
Far Dens Background		199.77	198.02	175 - 345			
Far Peak Background		78.22	77.75	70 - 140			
Far Lith Background		82.71	82.34	75 - 145			
CALIBRATION BLOCK SUMMARY							
Measurement	Current Reading (Previous Coef)	Calibrated (New Coef)	Change	Control Limit On Change			
MAGNESIUM							
Density (g/cc)	1.686	1.690	0.004	+/- 0.015			
Pe	2.613	2.547	-0.066	+/- 0.150			
ALUMINUM							
Density (g/cc)	2.581	2.591	0.010	+/- 0.01500			
Pe	3.131	3.120	-0.011	+/- 0.150			
TOOL SUMMARY							
Measurement	Near Detector		Far Detector				

	Value	Control Limits	Value	Control Limits
QUALITY				
Background	-0.0007	+/- 0.0110	-0.0011	+/- 0.0140
Magnesium Block	-0.0009	+/- 0.0110	-0.0019	+/- 0.0140
Aluminum Block	-0.0010	+/- 0.0110	-0.0006	+/- 0.0140
Resolution	9.81	6.00 - 11.50	9.22	6.00 - 11.50
Internal Verifier(B+D+P+L)	1661	1200 - 2700	873	800 - 1700

PASS/FAIL SUMMARY	
Background Quality Check:	Passed
Background Range Check:	Passed
Background Resolution Check:	Passed
Background Verification Check:	Passed
Magnesium Quality Check:	Passed
Aluminum Quality Check:	Passed
Gains Check:	Passed
Changes in Calibration Blocks:	Passed

SPECTRAL DENSITY FIELD CHECK

Tool Name:	SDLT Pad - I145_M85803_P45	Reference Calibration Date:	23-Jan-12 14:46:25
Engineer:	T. HYDE	Calibration Date:	25-Feb-12 17:38:21
Software Version:	WL INSITE R3.4.2 (Build 2)	Calibration Version:	1

Pad Temperature: 69.0 degF

DENSITY FIELD CALIBRATION SUMMARY				
Measurement	Shop	Field	Change	Control Limit +/-
Near (B+D+P+L) cps	1661.419	1654.123	-7.296	16.372
Far (B+D+P+L) cps	872.552	877.822	5.270	16.140
Near Resolution	9.81	9.88	0.070	0.50
Far Resolution	9.22	9.73	0.510	1.00

PASS/FAIL SUMMARY	
Bkg Quality Check:	Passed
Bkg Resolution Check:	Passed
Bkg Verification Check:	Passed

SPECTRAL DENSITY POST CHECK

Tool Name:	SDLT Pad - I145_M85803_P45	Reference Calibration Date:	25-Feb-12 17:38:21
Engineer:	T. HYDE	Calibration Date:	25-Feb-12 21:39:39
Software Version:	WL INSITE R3.4.2 (Build 2)	Calibration Version:	1

Pad Temperature: 57.6 degF

DENSITY POST CALIBRATION SUMMARY				
Measurement	Field	Post	Change	Control Limit +/-
Near (B+D+P+L) cps	1654.123	1658.350	4.227	16.372
Far (B+D+P+L) cps	877.822	873.813	-4.009	16.140
Near Resolution	9.88	9.84	-0.040	0.50
Far Resolution	9.73	9.54	-0.190	1.00

PASS/FAIL SUMMARY	
Bkg Quality Check:	Passed
Bkg Resolution Check:	Passed
Bkg Verification Check:	Passed

MICRO LOG SHOP CALIBRATION			
Tool Name:	Microlog Pad - I066_M85803_P45	Reference Calibration Date:	02-Sep-11 06:03:18
Engineer:	C. MARLOWE	Calibration Date:	31-Jan-12 20:02:12
Software Version:	WL INSITE R3.4.2 (Build 2)	Calibration Version:	1

Reference Calibration Date: 02-Sep-11 06:03:18

Calibration Date: 31-Jan-12 20:02:12

Calibration Version: 1

Measurement	CALIBRATION COEFFICIENT SUMMARY				
	Micro Log Normal		Micro Log Lateral		Units
	Measured	Calibrated	Measured	Calibrated	
Tool Zero	-0.07	-0.09	0.00	0.00	ohmm
Calibration Point #1	0.02	0.00	-0.00	0.00	ohmm
Calibration Point #2	19.97	20.00	19.98	20.00	ohmm
Internal Reference	19.90	19.93	19.97	19.99	ohmm
Measurement	Micro Log Normal Tool Value		Micro Log Lateral Tool Value		Units
Tool Zero	-0.53		3.16		V
Calibration Point #1	23.08		1.59		V
Calibration Point #2	5304.32		6881.96		V
Internal Reference	5284.73		6879.28		V

MICRO LOG FIELD CHECK			
Tool Name:	Microlog Pad - I066_M85803_P45	Reference Calibration Date:	31-Jan-12 20:02:12
Engineer:	T. HYDE	Calibration Date:	25-Feb-12 17:39:36
Software Version:	WL INSITE R3.4.2 (Build 2)	Calibration Version:	1

Reference Calibration Date: 31-Jan-12 20:02:12

Calibration Date: 25-Feb-12 17:39:36

Calibration Version: 1

	Measurement	Micro Log Normal		Micro Log Lateral	
		Shop	Field	Shop	Field
					Units
	Tool Zero	-0.09	-0.08	0.00	0.00
	Internal Reference	19.93	19.88	19.99	19.94
Summary					
	Signal	Shop	Field	Difference	Tolerance
	Microlog Normal	19.93	19.88	0.05	+/- 0.80
	Microlog Lateral	19.99	19.94	0.05	+/- 0.80

MICRO LOG POST CHECK			
Tool Name:	Microlog Pad - I066_M85803_P45	Reference Calibration Date:	25-Feb-12 17:39:36
Engineer:	T. HYDE	Calibration Date:	25-Feb-12 21:38:55
Software Version:	WL INSITE R3.4.2 (Build 2)	Calibration Version:	1

Reference Calibration Date: 25-Feb-12 17:39:36

Calibration Date: 25-Feb-12 21:38:55

Calibration Version: 1

	Measurement	Micro Log Normal		Micro Log Lateral		
		Field	Post	Field	Post	Units
	Tool Zero	-0.08	-0.10	0.00	0.02	ohmm
	Internal Reference	19.88	19.89	19.94	19.95	ohmm
Summary						
	Signal	Field	Post	Difference	Tolerance	
	Microlog Normal	19.88	19.89	0.01	+/- 0.80	
	Microlog Lateral	19.94	19.95	0.01	+/- 0.80	

CALIBRATION SUMMARY						
Sensor	Shop	Field	Post	Difference	Tolerance	Units

GTET-10811258

Gamma Ray Calibrator	232.0	230.0	228.2	1.8	+/- 9.00	api
DSNT-10755066						
Snow-Block Porosity	0.0560	0.0582	0.0576	0.0006	+/- 0.0150	decp
SDLT-I066_M85803_P45						
Pad Extension	3.75	3.70	3.70	0.00	+/-0.10	in
Ring Diameter	8.25	8.11	7.97	0.140	+/-0.15	in
ACRt Sonde-I1256_S0784						
Mud Cell	1.002	-----	-----	0.000	-----	ohm-m
SDLT Pad-I145_M85803_P45						
Near(B+D+P+L)	1661.419	1654.123	1658.350	-4.227	+/-16.372	cps
Far(B+D+P+L)	872.552	877.822	873.813	4.009	+/-16.140	cps
Microlog Pad-I066_M85803_P45						
MicroLog Normal	19.93	19.88	19.89	-0.01	+/-0.80	ohmm
MicroLog Lateral	19.99	19.94	19.95	-0.01	+/-0.80	ohmm
Data: GARDEN_CITY_V_110001 SP-GTET-DSN-SDL-BSAT-ACRT-CHWIDLE						
Date: 25-Feb-12 21:57:31						

HALLIBURTON

PARAMETERS REPORT

Depth (ft))	Tool Name	Mnemonic	Description	Value	Units
TOP					
	SHARED	BS	Bit Size	7.875	in
	SHARED	UBS	Use Bit Size instead of Caliper for all applications.	No	
	SHARED	MDBS	Mud Base	Water	
	SHARED	MDWT	Borehole Fluid Weight	9.500	ppg
	SHARED	WAGT	Weighting Agent	Natural	
	SHARED	BSAL	Borehole salinity	0.00	ppm
	SHARED	FSAL	Formation Salinity NaCl	0.00	ppm
	SHARED	KPCT	Percent K in Mud by Weight?	0.00	%
	SHARED	RMUD	Mud Resistivity	0.710	ohmm
	SHARED	TRM	Temperature of Mud	75.0	degF
	SHARED	CSD	Logging Interval is Cased?	No	
	SHARED	ICOD	AHV Casing OD	5.500	in
	SHARED	ST	Surface Temperature	75.0	degF
	SHARED	TD	Total Well Depth	4945.00	ft
	SHARED	BHT	Bottom Hole Temperature	96.0	degF
	SHARED	SVTM	Navigation and Survey Master Tool	NONE	
	SHARED	AZTM	High Res Z Accelerometer Master Tool	GTET	
	SHARED	TEMM	Temperature Master Tool	NONE	
	SHARED	BHSM	Borehole Size Master Tool	NONE	
	GTET	GROK	Process Gamma Ray?	Yes	
	GTET	GRSO	Gamma Tool Standoff	0.000	in
	GTET	GEOK	Process Gamma Ray EVR?	No	
	GTET	TPOS	Tool Position for Gamma Ray Tools.	Eccentered	
	DSNT	DNOK	Process DSN?	Yes	
	DSNT	DEOK	Process DSN EVR?	No	
	DSNT	NLIT	Neutron Lithology	Limestone	
	DSNT	DNSO	DSN Standoff - 0.25 in (6.35 mm) Recommended	0.250	in
	DSNT	DNTP	Temperature Correction Type	None	
	DSNT	DPRS	DSN Pressure Correction Type	None	
	DSNT	SHCO	View More Correction Options	No	
	DSNT	UTVD	Use TVD for Gradient Corrections?	No	

DNTT	DSN Tool Temperature	48.42	NO	
DSNS	DSN Tool Status	48.32	NO	
ERND	Near Detector Telemetry Counts EVR	48.42	BLK	0.000
ERFD	Far Detector Telemetry Counts EVR	49.17	BLK	0.000
ENTM	DSN Tool Temperature EVR	48.42	NO	
SDLT				
TPUL	Tension Pull	38.42	NO	
PCAL	Pad Caliper	38.42	TRI	0.250
ACAL	Arm Caliper	38.42	TRI	0.250
BSAT				
TPUL	Tension Pull	27.09	NO	
STAT	Status	27.09	NO	
DLYT	Delay Time	27.09	NO	
SI	Sample Interval	27.09	NO	
TXRX	Raw Telemetry 10 Receivers	27.09	NO	
FRMC	Tool Frame Count	27.09	NO	
ACRt Sonde				
TPUL	Tension Pull	2.97	NO	
F1R1	ACRT 12KHz - 80in R value	9.22	BLK	0.000
F1X1	ACRT 12KHz - 80in X value	9.22	BLK	0.000
F1R2	ACRT 12KHz - 50in R value	6.72	BLK	0.000
F1X2	ACRT 12KHz - 50in X value	6.72	BLK	0.000
F1R3	ACRT 12KHz - 29in R value	5.22	BLK	0.000
F1X3	ACRT 12KHz - 29in X value	5.22	BLK	0.000
F1R4	ACRT 12KHz - 17in R value	4.22	BLK	0.000
F1X4	ACRT 12KHz - 17in X value	4.22	BLK	0.000
F1R5	ACRT 12KHz - 10in R value	3.72	BLK	0.000
F1X5	ACRT 12KHz - 10in X value	3.72	BLK	0.000
F1R6	ACRT 12KHz - 6in R value	3.47	BLK	0.000
F1X6	ACRT 12KHz - 6in X value	3.47	BLK	0.000
F2R1	ACRT 36KHz - 80in R value	9.22	BLK	0.000
F2X1	ACRT 36KHz - 80in X value	9.22	BLK	0.000
F2R2	ACRT 36KHz - 50in R value	6.72	BLK	0.000
F2X2	ACRT 36KHz - 50in X value	6.72	BLK	0.000
F2R3	ACRT 36KHz - 29in R value	5.22	BLK	0.000
F2X3	ACRT 36KHz - 29in X value	5.22	BLK	0.000
F2R4	ACRT 36KHz - 17in R value	4.22	BLK	0.000
F2X4	ACRT 36KHz - 17in X value	4.22	BLK	0.000
F2R5	ACRT 36KHz - 10in R value	3.72	BLK	0.000
F2X5	ACRT 36KHz - 10in X value	3.72	BLK	0.000
F2R6	ACRT 36KHz - 6in R value	3.47	BLK	0.000
F2X6	ACRT 36KHz - 6in X value	3.47	BLK	0.000
F3R1	ACRT 72KHz - 80in R value	9.22	BLK	0.000
F3X1	ACRT 72KHz - 80in X value	9.22	BLK	0.000
F3R2	ACRT 72KHz - 50in R value	6.72	BLK	0.000
F3X2	ACRT 72KHz - 50in X value	6.72	BLK	0.000
F3R3	ACRT 72KHz - 29in R value	5.22	BLK	0.000
F3X3	ACRT 72KHz - 29in X value	5.22	BLK	0.000
F3R4	ACRT 72KHz - 17in R value	4.22	BLK	0.000
F3X4	ACRT 72KHz - 17in X value	4.22	BLK	0.000
F3R5	ACRT 72KHz - 10in R value	3.72	BLK	0.000
F3X5	ACRT 72KHz - 10in X value	3.72	BLK	0.000
F3R6	ACRT 72KHz - 6in R value	3.47	BLK	0.000

F3X6	ACRT 72KHz - 6in X value	3.47	BLK	0.000
RMUD	Mud Resistivity	12.76	BLK	0.000
F1RT	Transmitter Reference 12 KHz Real Signal	2.97	BLK	0.000
F1XT	Transmitter Reference 12 KHz Imaginary Signal	2.97	BLK	0.000
F2RT	Transmitter Reference 36 KHz Real Signal	2.97	BLK	0.000
F2XT	Transmitter Reference 36 KHz Imaginary Signal	2.97	BLK	0.000
F3RT	Transmitter Reference 72 KHz Real Signal	2.97	BLK	0.000
F3XT	Transmitter Reference 72 KHz Imaginary Signal	2.97	BLK	0.000
TFPU	Upper Feedpipe Temperature Calculated	2.97	BLK	0.000
TFPL	Lower Feedpipe Temperature Calculated	2.97	BLK	0.000
ITMP	Instrument Temperature	2.97	BLK	0.000
TCVA	Temperature Correction Values Loop Off	2.97	NO	
TIDV	Instrument Temperature Derivative	2.97	NO	
TUDV	Upper Temperature Derivative	2.97	NO	
TLDV	Lower Temperature Derivative	2.97	NO	
TRBD	Receiver Board Temperature	2.97	NO	
SDLT Pad				
TPUL	Tension Pull	38.41	NO	
NAB	Near Above	38.24	BLK	0.920
NHI	Near Cesium High	38.24	BLK	0.920
NLO	Near Cesium Low	38.24	BLK	0.920
NVA	Near Valley	38.24	BLK	0.920
NBA	Near Barite	38.24	BLK	0.920
NDE	Near Density	38.24	BLK	0.920
NPK	Near Peak	38.24	BLK	0.920
NLI	Near Lithology	38.24	BLK	0.920
NBAU	Near Barite Unfiltered	38.24	BLK	0.250
NLIU	Near Lithology Unfiltered	38.24	BLK	0.250
FAB	Far Above	38.58	BLK	0.250
FHI	Far Cesium High	38.58	BLK	0.250
FLO	Far Cesium Low	38.58	BLK	0.250
FVA	Far Valley	38.58	BLK	0.250
FBA	Far Barite	38.58	BLK	0.250
FDE	Far Density	38.58	BLK	0.250
FPK	Far Peak	38.58	BLK	0.250
FLI	Far Lithology	38.58	BLK	0.250
PTMP	Pad Temperature	38.42	BLK	0.920
NHV	Near Detector High Voltage	37.81	NO	
FHV	Far Detector High Voltage	37.81	NO	
ITMP	Instrument Temperature	37.81	NO	
DDHV	Detector High Voltage	37.81	NO	
Microlog Pad				
TPUL	Tension Pull	38.60	NO	
MINV	Microlog Lateral	38.60	BLK	0.750
MNOR	Microlog Normal	38.60	BLK	0.750
Data: GARDEN_CITY_V_1I0001 SP-GTET-DSN-SDL-BSAT-ACRT-CHIDLE				Date: 25-Feb-12 20:05:50

COMPANY	OXY USA INC
WELL	GARDEN CITY V-1
FIELD	GARDEN CITY

