

MICROLOG

Fold here

LOGGING DATA

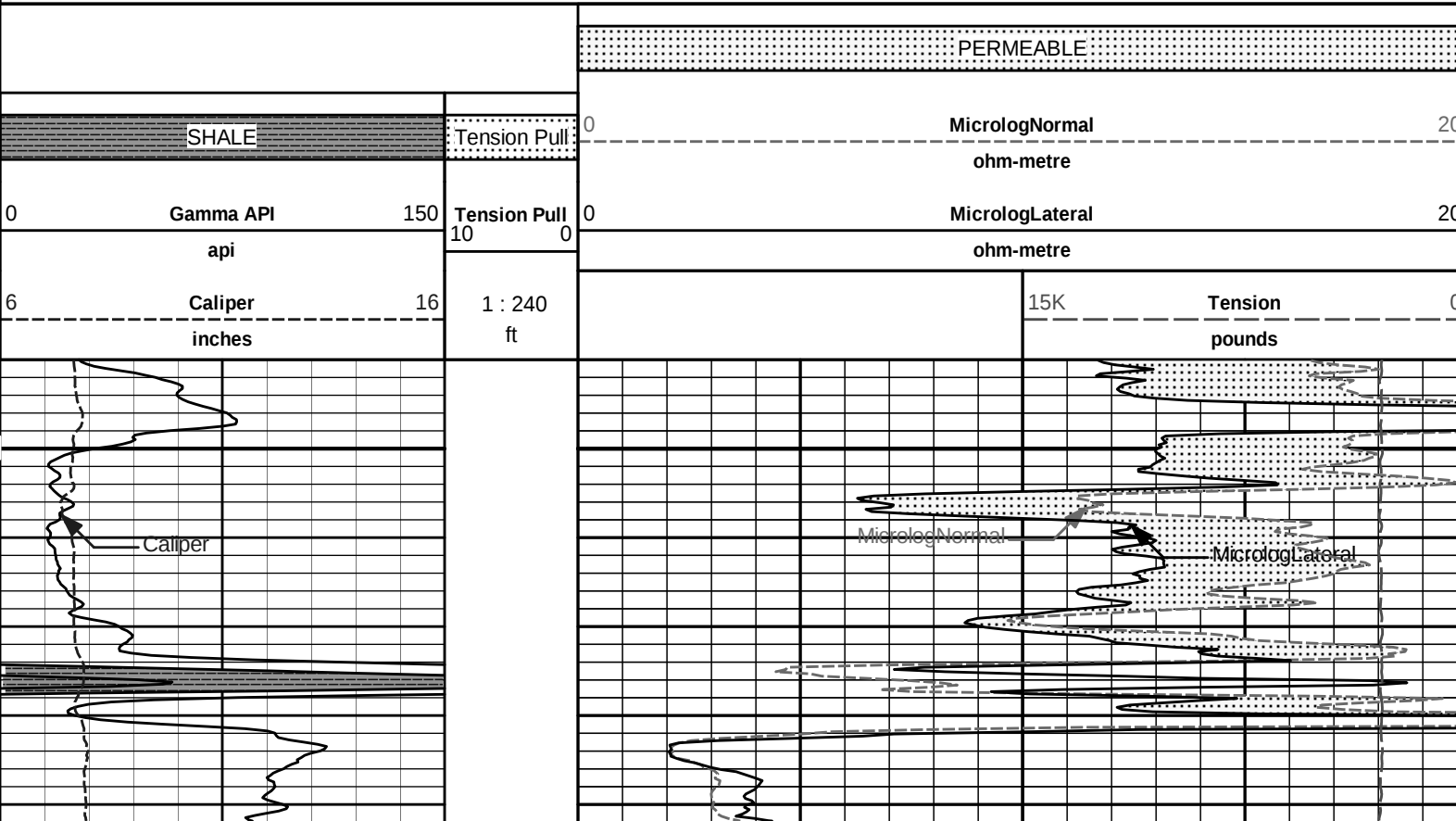
GENERAL	GAMMA	ACQUSTIC	PERCUTAN	NEUTRON
---------	-------	----------	----------	---------

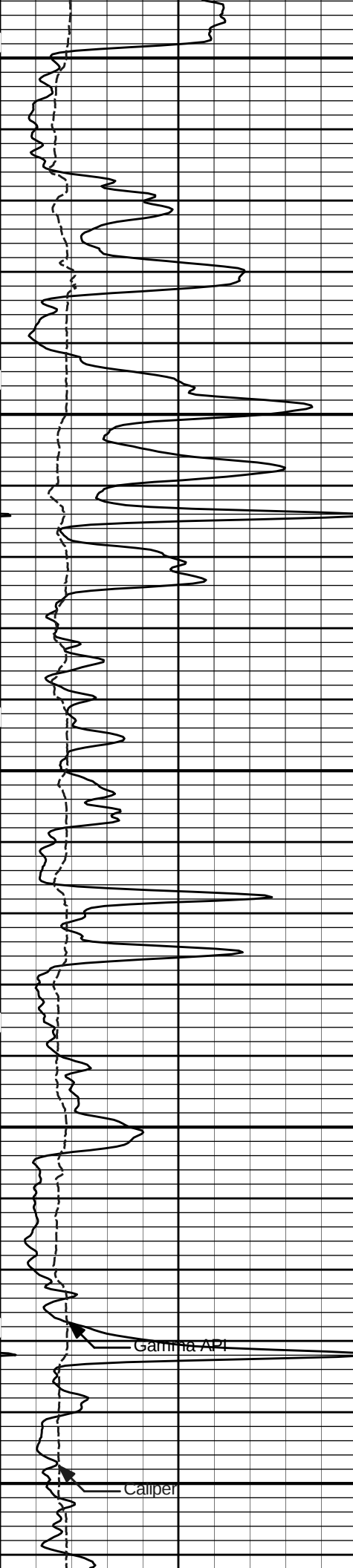
GENERAL			GAMMA		ACOUSTIC		DENSITY		NEUTRON					
Run	Depth		Speed	Scale		Scale		Matrix	Scale		Matrix	Scale		Matrix
No.	From	To	ft/min	L	R	L	R		L	R		L	R	
ONE	TD	3750'	REC	0	150									
DIRECTIONAL INFORMATION														
Maximum Deviation @								KOP @						
Remarks: SP-GTET-DSNT-SDLT-BSAT-ACRT RUN IN COMBINATION														
ANNULAR HOLE VOLUME CALCULATED FOR 5.5 INCH CASING														
CHLORIDES REPORTED AT 2600 MG/L														
POST JOB TOOL VERIFICATIONS NOT DONE AT CUSTOMER REQUEST														
TODAY'S CREW: A. VAQUERA, F. VILLA														
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: 14-Apr-12 09:53:03
Plot Range: 3740 ft to 5001.08 ft
Data: SHELL_B_4\Well Based\DETAIL\
Plot File: \\LOCAL-ISHELL_B_4\0001 SP-GTET-DSN-SDL-BSAT-ACRT-CH\MICRO\Microlog_IQ_5_main.lib

5 INCH MAIN LOG





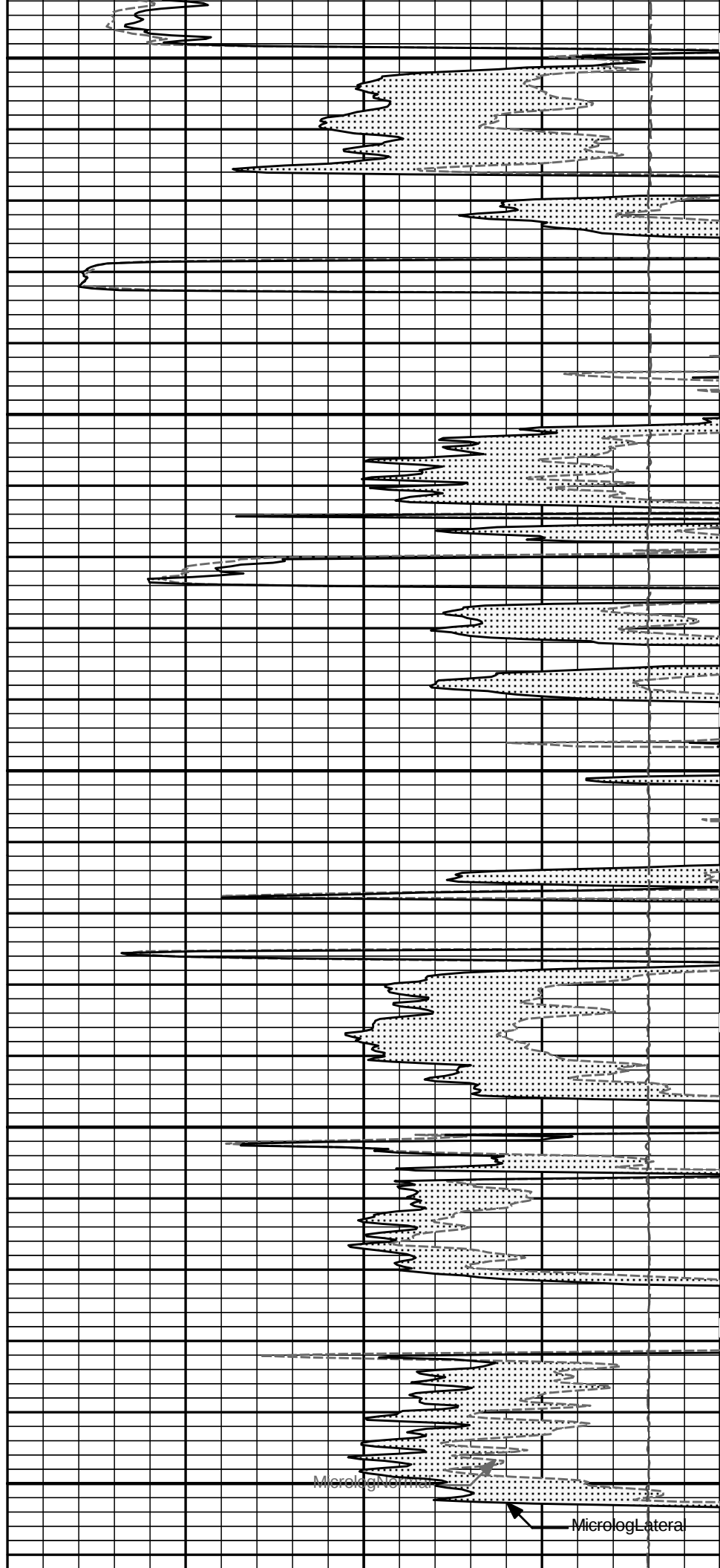
3800

3900

4000

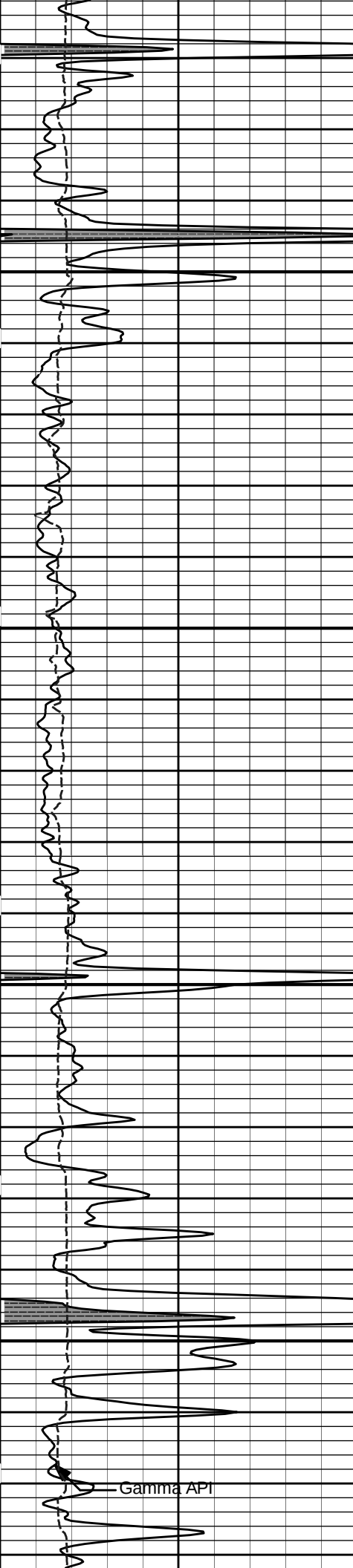
Gamma API

Caliper



MicrologNormal

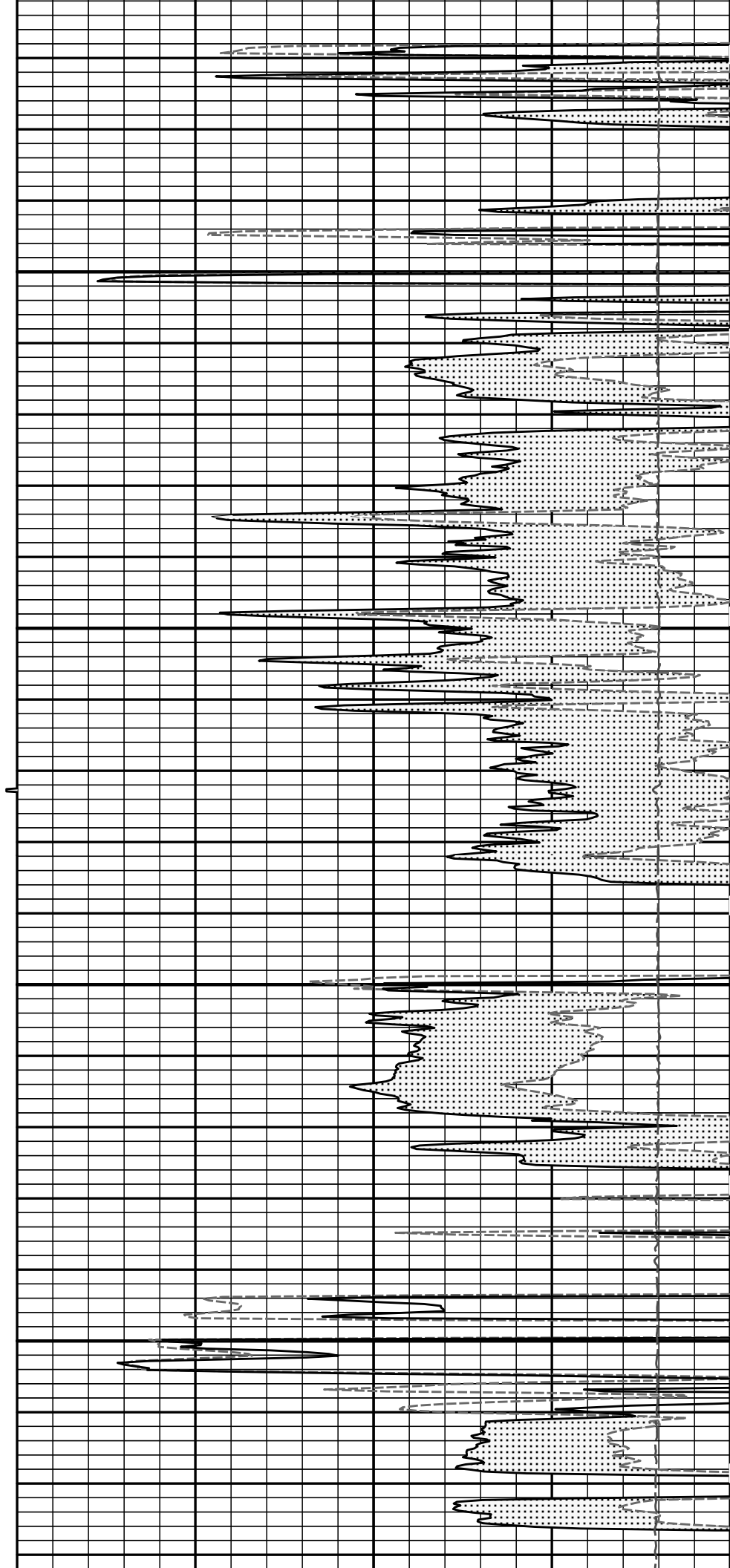
MicrologLateral

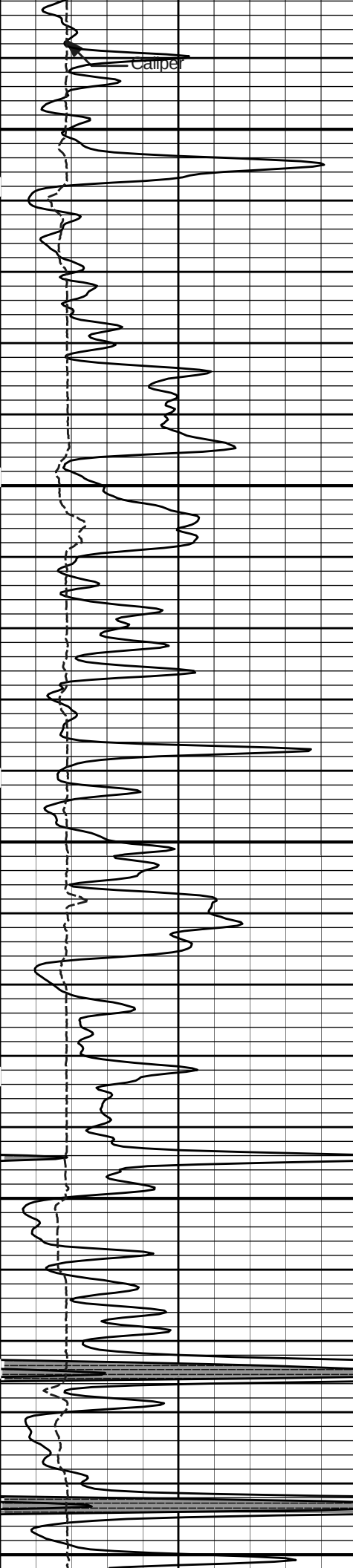


4100

4200

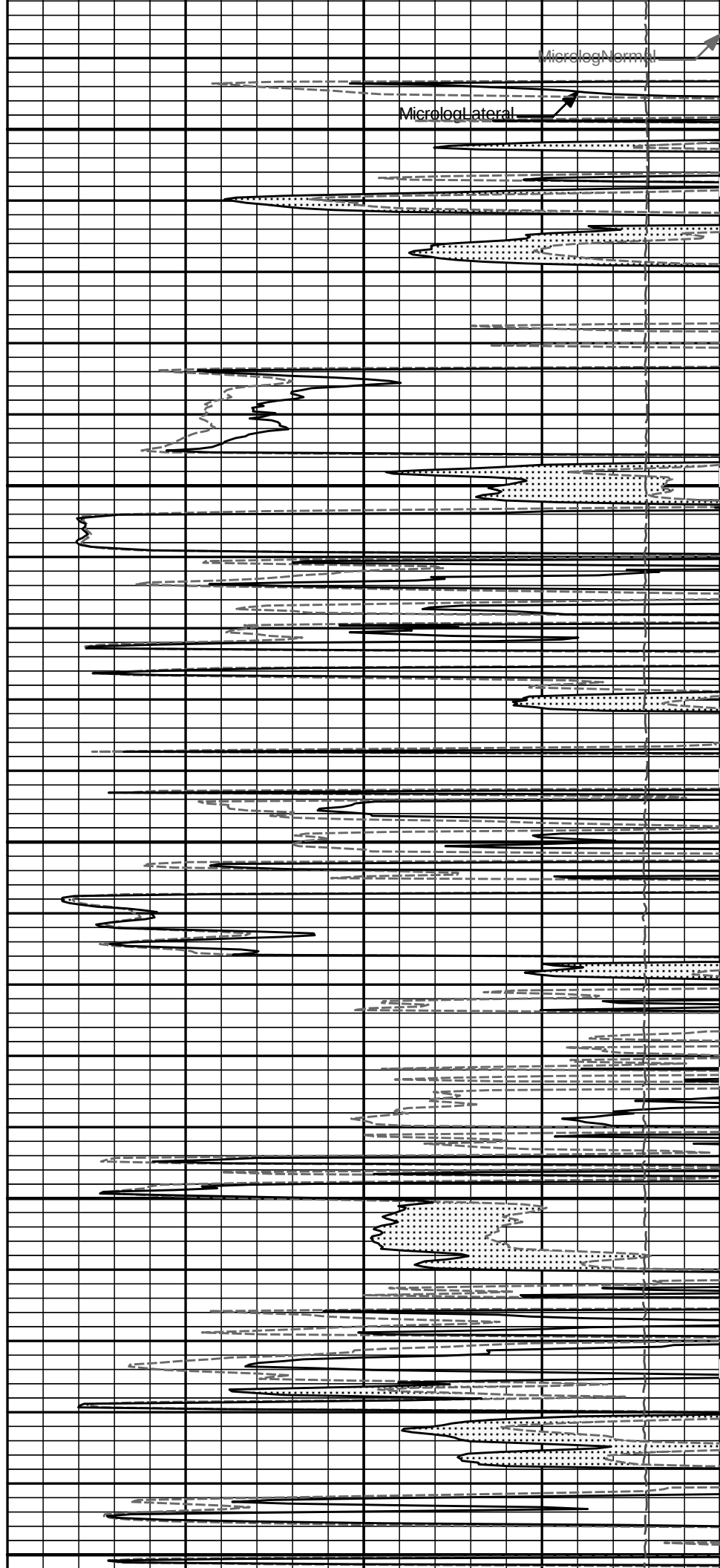
Gamma API

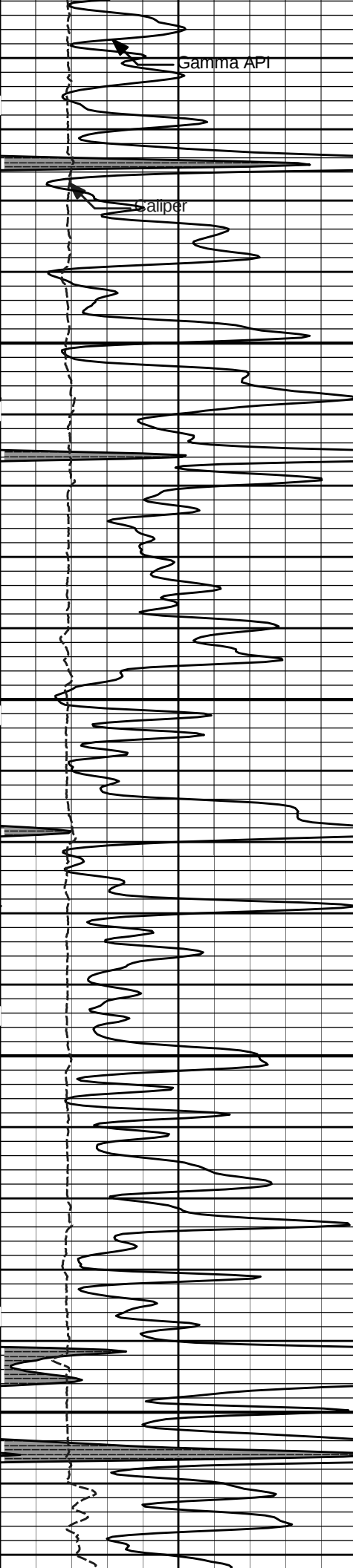




4300

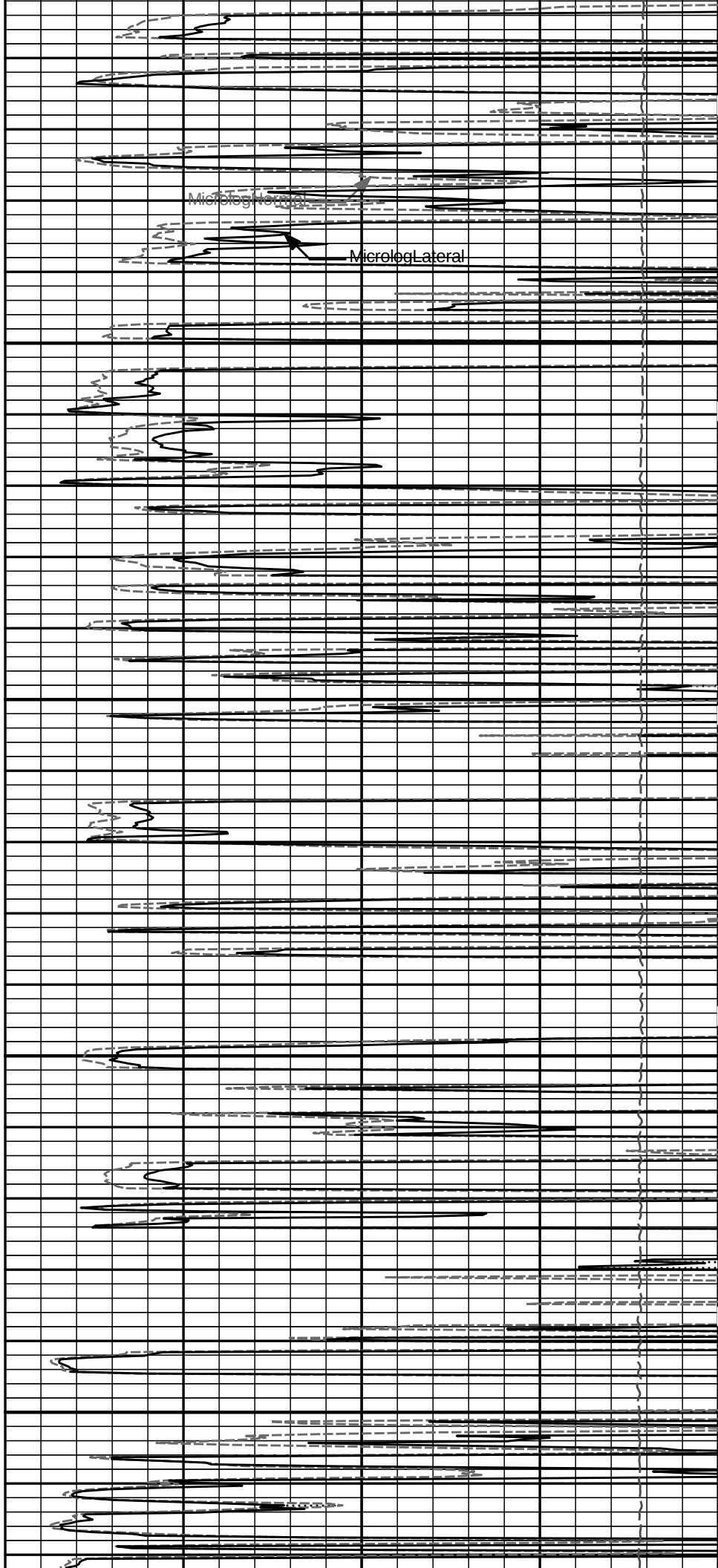
4400

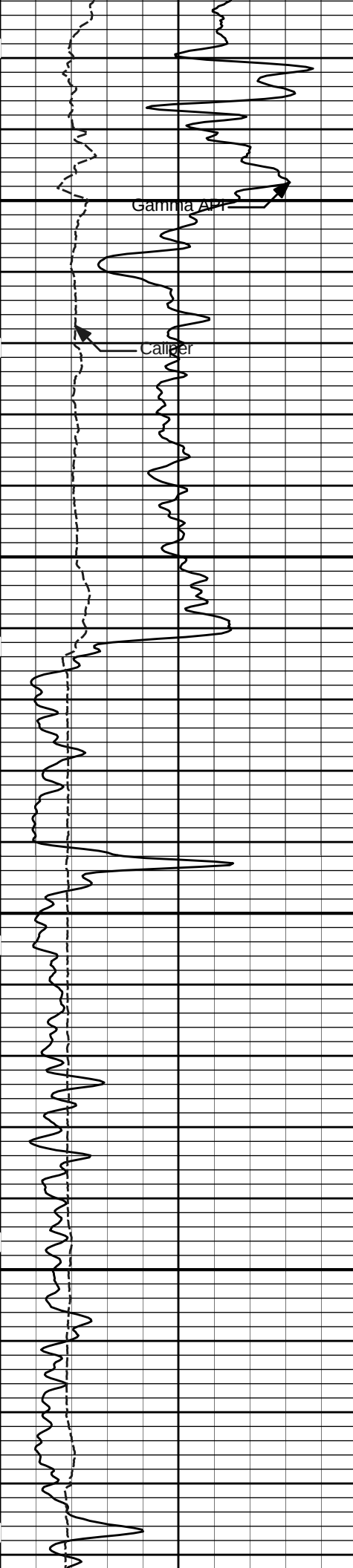




4500

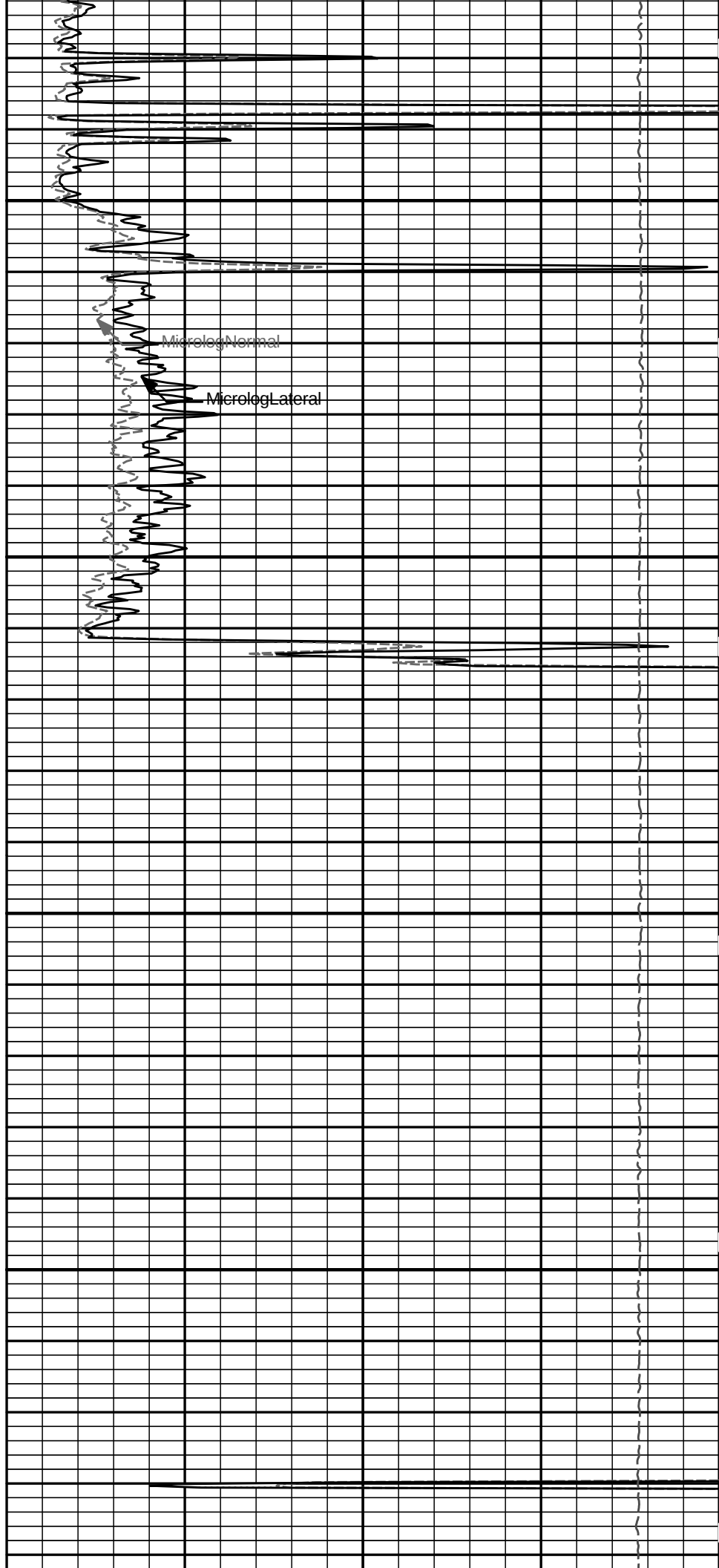
4600

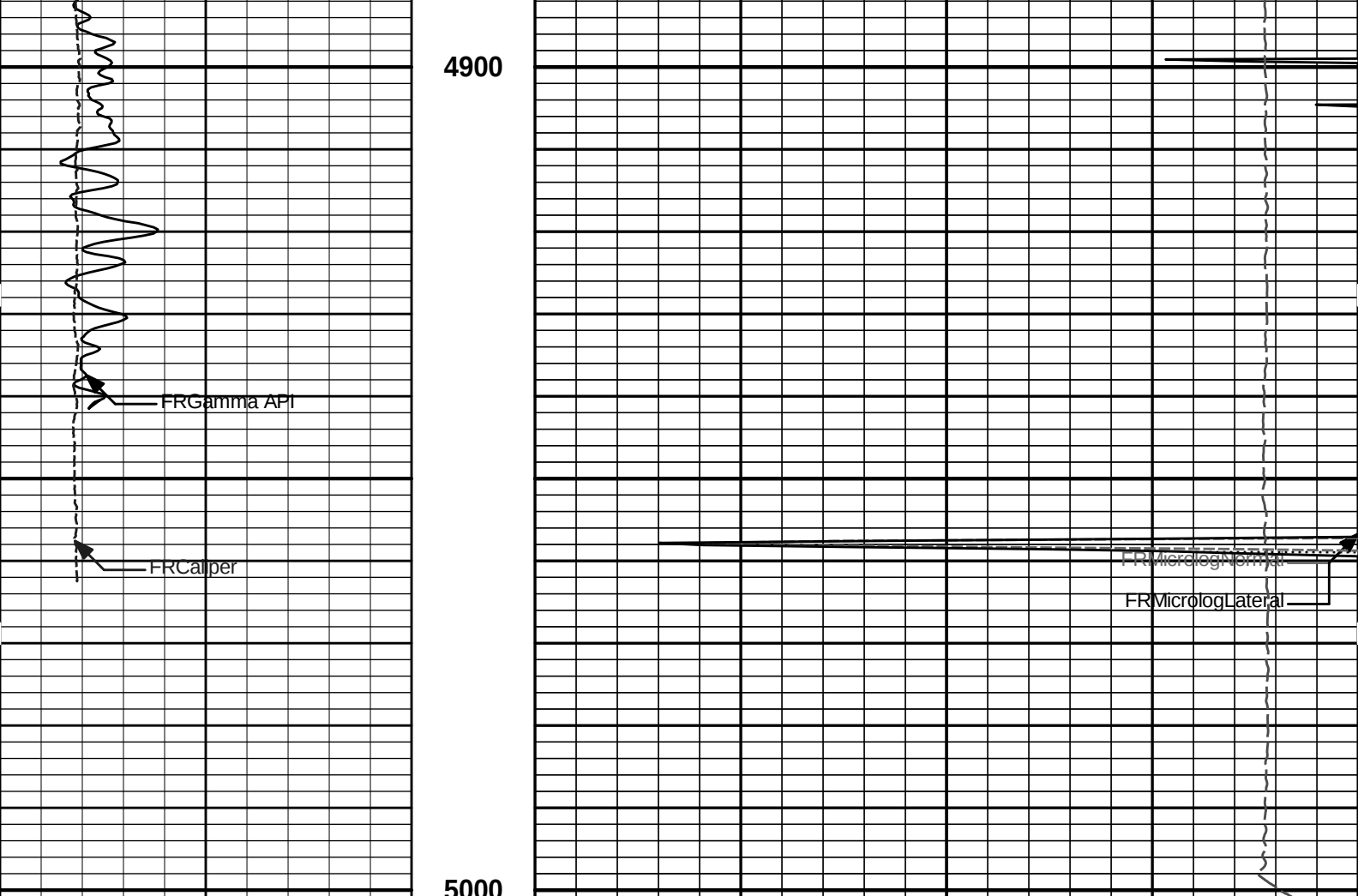




4700

4800





6	Caliper	16	1 : 240	15K	Tension	0
	inches		ft		pounds	
0	Gamma API	150	Tension Pull	0	MicrologLateral	20
	api		10 0		ohm-metre	
	SHALE		Tension Pull	0	MicrologNormal	20
					ohm-metre	
					PERMEABLE	

HALLIBURTON

Plot Time: 14-Apr-12 09:53:05
Plot Range: 3740 ft to 5001.08 ft
Data: SHELL_B_4\Well Based\DETAIL\
Plot File: \\-LOCAL-\\SHELL_B_4\0001 SP-GTET-DSN-SDL-BSAT-ACRT-CH\MICROMicrolog_IQ_5_main_lib

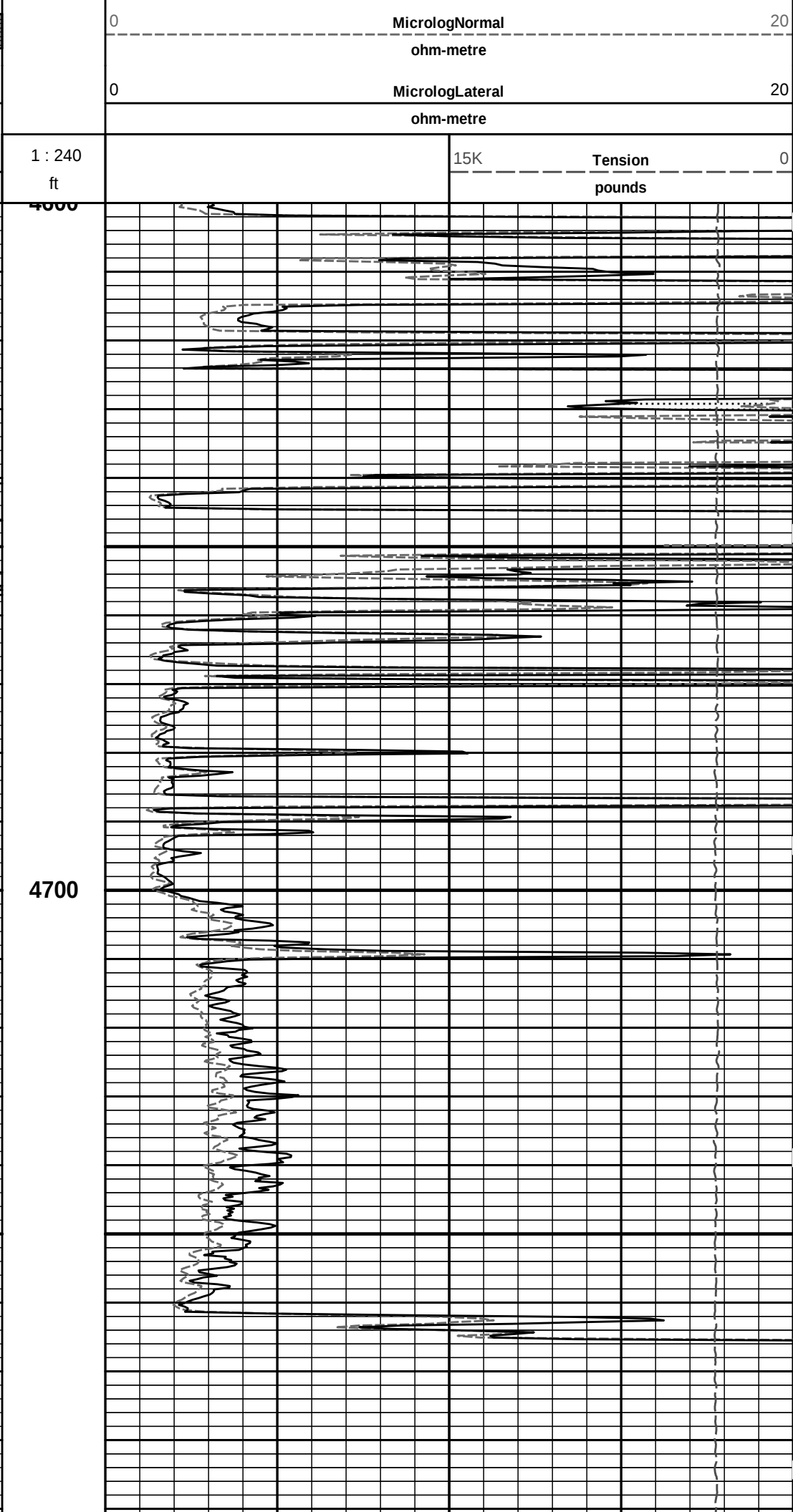
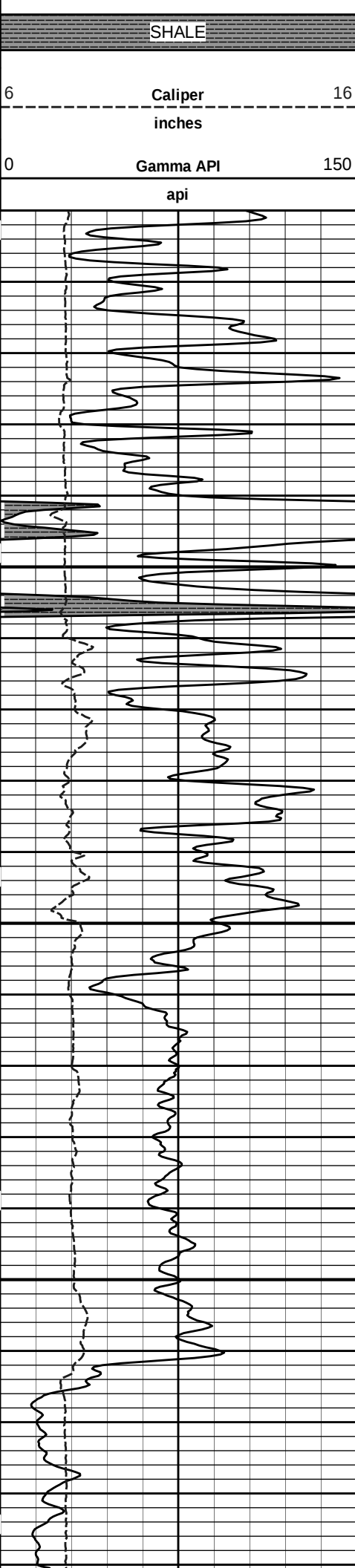
5 INCH MAIN LOG

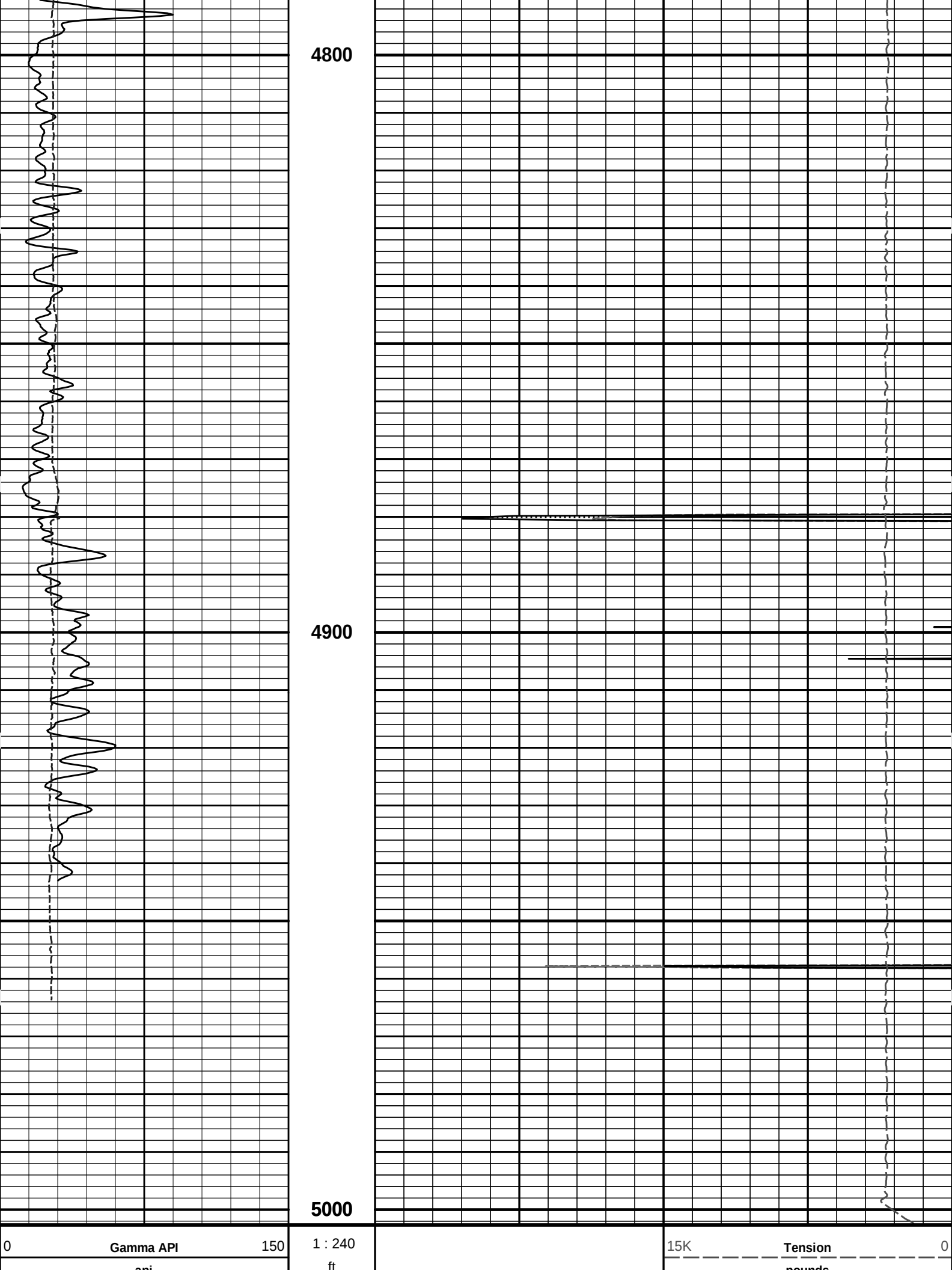
HALLIBURTON

Plot Time: 14-Apr-12 09:53:06
Plot Range: 4600 ft to 5002.5 ft
Data: SHELL_B_4\Well Based\REPEAT\
Plot File: \\-LOCAL-\\SHELL_B_4\0001 SP-GTET-DSN-SDL-BSAT-ACRT-CH\MICROMicrolog_IQ_5_rep_lib

REPEAT SECTION

					PERMEABLE	
--	--	--	--	--	-----------	--





4800

4900

5000

6	Caliper	16	0	MicrologLateral	20
	inches			ohm-metre	
	SHALE		0	MicrologNormal	20
				ohm-metre	
				PERMEABLE	

HALLIBURTON

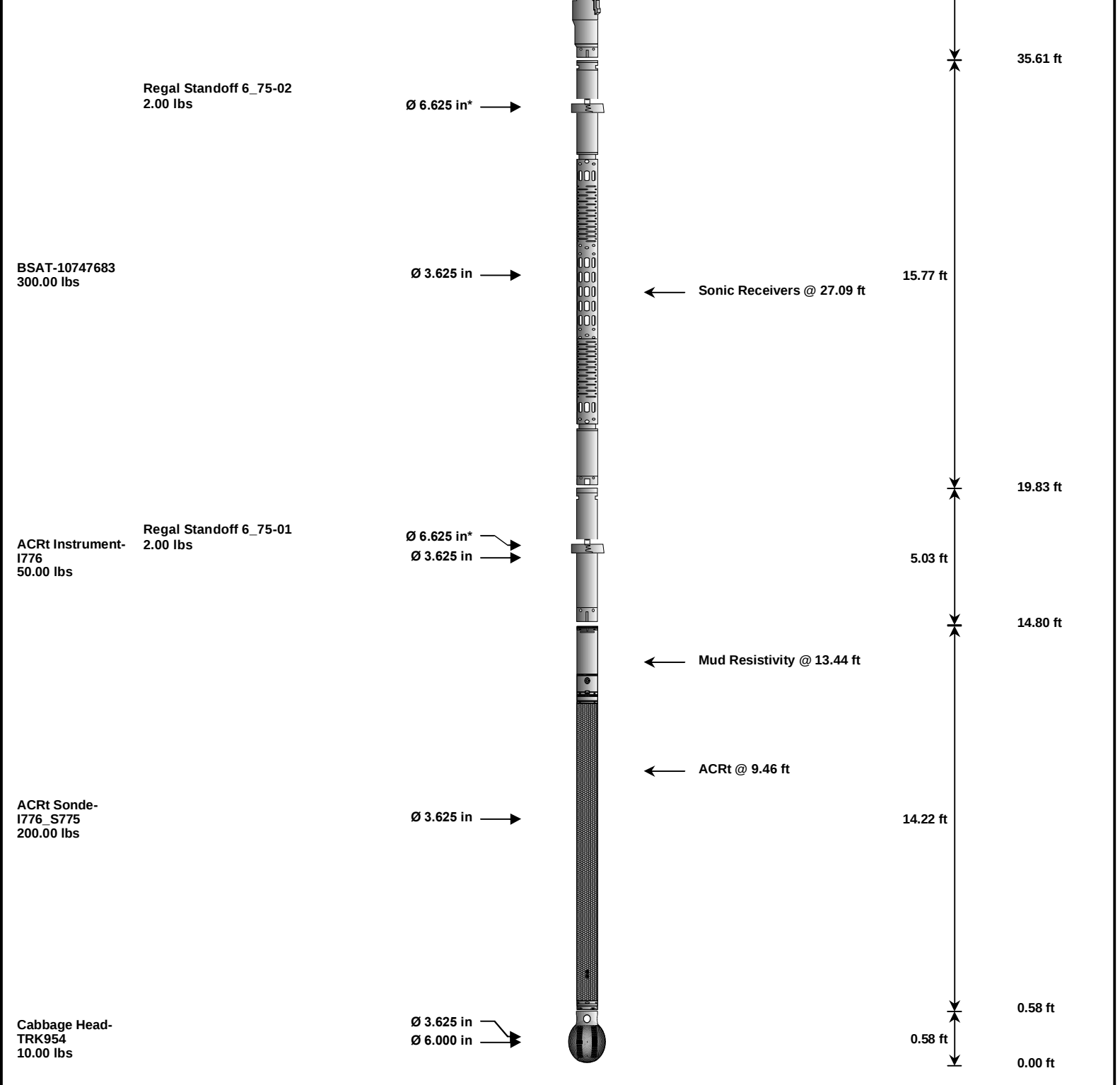
Plot Time: 14-Apr-12 09:53:07
Plot Range: 4600 ft to 5002.5 ft
Data: SHELL_B_4\Well Based\REPEAT\
Plot File: \\-LOCAL-\\SHELL_B_4\\0001 SP-GTET-DSN-SDL-BSAT-ACRT-CH\\MICRO\\Microlog_IQ_5_rep.lib

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-10735145 174.00 lbs		Ø 3.625 in →		← DSN Far @ 49.17 ft ← DSN Near @ 48.42 ft	9.69 ft	
						46.42 ft
SDLT- I145_M73803_P90 360.00 lbs	SDLT Pad-90 65.00 lbs Microlog Pad- I145_M73803_P90 8.00 lbs	Ø 4.500 in → Ø 4.750 in* → Ø 4.750 in* →		Microlog @ 38.61 ft SDL Caliper @ 38.42 ft SDL @ 38.41 ft	10.81 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		10735145	174.00	9.69	46.42	60.00
DCNT	DSN Decentralizer		10735145	6.60	5.13	* 49.75	300.00
SDLT	Spectral Density Tool		I145_M73803_P90	360.00	10.81	35.61	60.00
MICP	Microlog Pad		I145_M73803_P90	8.00	1.00	* 38.11	60.00
SDLP	Density Insite Pad		90	65.00	2.55	* 37.82	60.00
BSAT	Borehole Sonic Array Tool		10747683	300.00	15.77	19.83	60.00
RSOF	Regal Standoff 6.75in		02	2.00	0.52	* 33.63	300.00
ACRt	Array Compensated True Resistivity Instrument Section		I776	50.00	5.03	14.80	300.00
RSOF	Regal Standoff 6.75in		01	2.00	0.52	* 17.40	300.00
ACRt	Array Compensated True Resistivity		I776_S775	200.00	14.22	0.58	300.00
CBHD	Cabbage Head		TRK954	10.00	0.58	0.00	300.00
Total				1,432.60	70.28		

HALLIBURTON

CALIBRATION REPORT

NATURAL GAMMA RAY TOOL SHOP CALIBRATION

Tool Name:	GTET - 10811258	Reference Calibration Date:	27-Feb-12 10:45:14
Engineer:	C. MARLOWE	Calibration Date:	03-Apr-12 13:40:54
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	23.6	23.3	api
Background + Calibrator	258.0	255.3	api
Calibrator	234.4	232.0	api

NATURAL GAMMA RAY TOOL FIELD CALIBRATION

Tool Name:	GTET - 10811258	Reference Calibration Date:	03-Apr-12 13:40:54
Engineer:	CORY HANSON	Calibration Date:	14-Apr-12 06:52:40
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	23.3	30.5	api
Background + Calibrator	255.3	259.8	api
Calibrator	232.0	229.2	api

Shop	Field	Difference	Tolerance
232.0	229.2	2.8	+/- 9.00

MICRO LOG SHOP CALIBRATION

Tool Name:	Microlog Pad - I145_M73803_P90	Reference Calibration Date:	13-Jan-12 12:43:35
Engineer:	J. BOLLLOM	Calibration Date:	12-Mar-12 08:17:08
Software Version:	WL INSITE R3.4.2 (Build 2)	Calibration Version:	1

CALIBRATION COEFFICIENT SUMMARY					
Measurement	Micro Log Normal		Micro Log Lateral		Units
	Measured	Calibrated	Measured	Calibrated	
Tool Zero	-0.08	-0.07	-0.00	-0.01	ohmm
Calibration Point #1	-0.02	0.00	0.00	0.00	ohmm
Calibration Point #2	19.92	20.00	19.94	20.00	ohmm
Internal Reference	19.85	19.93	19.94	19.99	ohmm

Measurement	Micro Log Normal Tool Value	Micro Log Lateral Tool Value	Units
Tool Zero	-0.32	-0.77	V
Calibration Point #1	17.42	1.71	V
Calibration Point #2	5232.42	6088.77	V

Calibration Point #2		5373.42	6988.77	V			
Internal Reference		5354.44	6985.83	V			
MICRO LOG FIELD CHECK							
Tool Name:	Microlog Pad - I145_M73803_P90		Reference Calibration Date:	12-Mar-12 08:17:08			
Engineer:	CORY HANSON		Calibration Date:	14-Apr-12 06:50:01			
Software Version:	WL INSITE R3.4.2 (Build 2)		Calibration Version:	1			
	Measurement	Micro Log Normal		Micro Log Lateral			
		Shop	Field	Shop	Field	Units	
	Tool Zero	-0.07	-0.06	-0.01	-0.00	ohmm	
	Internal Reference	19.93	19.96	19.99	20.02	ohmm	
	Summary						
	Signal	Shop	Field	Difference	Tolerance		
	Microlog Normal	19.93	19.96	-0.03	+/- 0.80		
	Microlog Lateral	19.99	20.02	-0.03	+/- 0.80		
	CALIBRATION SUMMARY						
	Sensor	Shop	Field	Post	Difference	Tolerance	Units
	GTET-10811258						
Gamma Ray Calibrator	232.0	229.2	-----	2.8	+/- 9.00	api	
Microlog Pad-I145_M73803_P90							
MicroLog Normal	19.93	19.96	-----	-0.03	+/-0.80	ohmm	
MicroLog Lateral	19.99	20.02	-----	-0.03	+/-0.80	ohmm	
Data: SHELL_B_4I0001 SP-GTET-DSN-SDL-BSAT-ACRT-CHIIDLE					Date: 14-Apr-12 09:06:38		
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	9.000	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	2.290	ohmm		
	SHARED	TRM	Temperature of Mud	80.0	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	5033.00	ft		
	SHARED	BHT	Bottom Hole Temperature	125.0	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			
	Rwa /	YPOK	Process Crossplot?	Yes			

CrossPlot	XFOR	Process Crossplot?	Yes	
Rwa / CrossPlot	FCHO	Select Source of F	Automatic	
Rwa / CrossPlot	AFAC	Archie A factor	0.6200	
Rwa / CrossPlot	MFAC	Archie M factor	2.1500	
Rwa / CrossPlot	RMFR	Rmf Reference	2.00	ohmm
Rwa / CrossPlot	TMFR	Rmf Ref Temp	75.00	degF
Rwa / CrossPlot	RWA	Resistivity of Formation Water	0.05	ohmm
Rwa / CrossPlot	ADP	Use Air Porosity to calculate CrossplotPhi	No	
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	DSNO	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	
DSNT	LHWT	Logging Horizontal Water Tank?	No	
SDLT	CLOK	Process Caliper Outputs?	Yes	
SDLT Pad	DNOK	Process Density?	Yes	
SDLT Pad	DNOK	Process Density EVR?	No	
SDLT Pad	CB	Logging Calibration Blocks?	No	
SDLT Pad	SPVT	SDLT Pad Temperature Valid?	Yes	
SDLT Pad	DTWN	Disable temperature warning	No	
SDLT Pad	DMA	Formation Density Matrix	2.710	g/cc
SDLT Pad	DFL	Formation Density Fluid	1.000	g/cc
Microlog Pad	MLOK	Process MicroLog Outputs?	Yes	
BSAT	MBOK	Compute BCAS Results?	Yes	
BSAT	FLLO	Frequency Filter Low Pass Value?	5000	Hz
BSAT	FLHI	Frequency Filter High Pass Value?	27000	Hz
BSAT	DTFL	Delta -T Fluid	189.00	uspf
BSAT	DTMT	Delta -T Matrix Type	User define	
BSAT	DTMA	Delta -T Matrix	47.60	uspf
BSAT	DTSH	Delta -T Shale	100.00	uspf
BSAT	SPEQ	Acoustic Porosity Equation	Wylie	
ACRt Sonde	RTOK	Process ACRt?	Yes	
ACRt Sonde	MNSO	Minimum Tool Standoff	1.50	in
ACRt Sonde	TCS1	Temperature Correction Source	FP Lwr & FP Upr	
ACRt Sonde	TPOS	Tool Position	Free Hanging	
ACRt Sonde	RMOP	Rmud Source	Mud Cell	
ACRt Sonde	RMIN	Minimum Resistivity for MAP	0.20	ohmm
ACRt Sonde	RMIN	Maximum Resistivity for MAP	200.00	ohmm
ACRt Sonde	THQY	Threshold Quality	0.50	
BOTTOM				
Data: SHELL_B_4I0001 SP-GTET-DSN-SDL-BSAT-ACRT-CHIDLE			Date: 14-Apr-12 09:04:17	

INPUTS, DELAYS AND FILTERS TABLE					
Mnemonic		Input Description	Delay (ft)	Filter Type	Filter Length (ft)
Depth Panel					
TENS	Tension		0.00	NO	
SP Sub					
PLTC	Plot Control Mask		66.58	NO	
SP	Spontaneous Potential		66.58	BLK	1.250
SPR	Raw Spontaneous Potential		66.58	NO	
SPO	Spontaneous Potential Offset		66.58	NO	
GTET					
TPUL	Tension Pull		58.56	NO	
GR	Natural Gamma Ray API		58.56	TRI	1.750
GRU	Unfiltered Natural Gamma Ray API		58.56	NO	
EGR	Natural Gamma Ray API with Enhanced Vertical Resolution		58.56	W	1.416 , 0.750
ACCZ	Accelerometer Z		0.00	BLK	0.083
DEVI	Inclination		0.00	NO	
DSNT					
TPUL	Tension Pull		48.32	NO	
RNDS	Near Detector Telemetry Counts		48.42	BLK	1.417
RFDS	Far Detector Telemetry Counts		49.17	TRI	0.583
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: SHELL_B_4I0001 SP-GTET-DSN-SDL-BSAT-ACRT-CHIDLE			Date: 14-Apr-12 09:04:54	

COMPANY	OXY USA INC		
WELL	SHELL B-4		
FIELD	AMAZON DITCH		
COUNTY	FINNEY	STATE	KANSAS
HALLIBURTON		MICROLOG	