

HALIBURTON

MICROLOG

COMPANY				STRATA EXPLORATION					
WELL				TODD 3-32					
FIELD				EINSEL					
COUNTY				KIOWA					
STATE				KANSAS					
Permanent Datum		GROUND LEVEL		Sect. 32		Twp. 27S		Rge. 18W	
Log measured from		KELLY BUSHING		Elev. 2209.0 ft		Elev. K.B.		2220.0 ft	
Drilling measured from		KELLYBUSHING		11.0 ft above perm. Datum		D.F.		2219.0 ft	
Date		06-Oct-11				G.L.		2209.0 ft	
Run No.		ONE							
Depth - Driller		4875.00 ft							
Depth - Logger		4873.0 ft							
Bottom - Logged Interval		4851.0 ft							
Top - Logged Interval		3800.0 ft							
Casing - Driller		8.625 in		@ 604.0 ft				@	
Casing - Logger		604.0 ft							
Bit Size		7.875 in		@				@	
Type Fluid in Hole		WATER BASED MUD							
Density		9.2 ppq		52.00 s/qt					
PH		11.00 pH		8.0 cpm					
Source of Sample		FLOWLINE							
Rm @ Meas. Temperature		0.400 ohmm		@ 76.00 degF		@		@	
Rmf @ Meas. Temperature		0.47 ohmm		@ 62.00 degF		@		@	
Rmc @ Meas. Temperature		0.520 ohmm		@ 62.00 degF		@		@	
Source Rmf		Rmc		MEAS		MEAS			
Rm @ BHT		0.31 ohmm		@ 119.0 degF		@		@	
Time Since Circulation		4.1 hr							
Time on Bottom		06-Oct-11 08:07							
Max. Rec. Temperature		119.0 degF		@ 4873.0 ft		@		@	
Equipment		10546866		LIBERAL					
Recorded By		C. HAVERKAMP							
Witnessed By		J. CHRISTENSEN							

Other Services:
DSNT / SDLT
ACRT
MRIL

Fold here

Service Ticket No.: 8509528				API Serial No.: 15-097-21708				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		MICRO		RUBBER		ADJ		N/A	
Rmc @ Meas. Temp.		@		@											
Source Rmf		Rmc													
Rm @ BHT		@		@											
Rmf @ BHT		@		@											
Rmc @ BHT		@		@											
EQUIPMENT DATA															
GAMMA				ACOUSTIC				DENSITY				NEUTRON			
Run No.		ONE		Run No.				Run No.				Run No.			
Serial No.		11048627		Serial No.				Serial No.				Serial No.			
Model No.		GTET		Model No.				Model No.				Model No.			
Diameter		3.625"		No. of Cent.				Diameter				Diameter			
Detector Model No.		T-102		Spacing				Log Type				Log Type			
Type		SCINT						Source Type				Source Type			
Length		8"		LSA [Y/N]				Serial No.				Serial No.			
Distance to Source		10'		FWDA [Y/N]				Strength				Strength			
LOGGING DATA															

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	4873'	3800'	REC	0	150											
DIRECTIONAL INFORMATION																
Maximum Deviation								@	KOP							@
Remarks: SP-GTET-DSNT-SDLT-ACRT RAN IN COMBNATION.																
ANNULAR HOLE VOLUME CALCULATED FOR 5.5 INCH CASING.																
CHLORIDES REPORTED AT 6100 PPM.																
LCM REPORTED AT 1 LB/BBL.																
YOUR CREW: V. JAIME, B. TERELL																
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

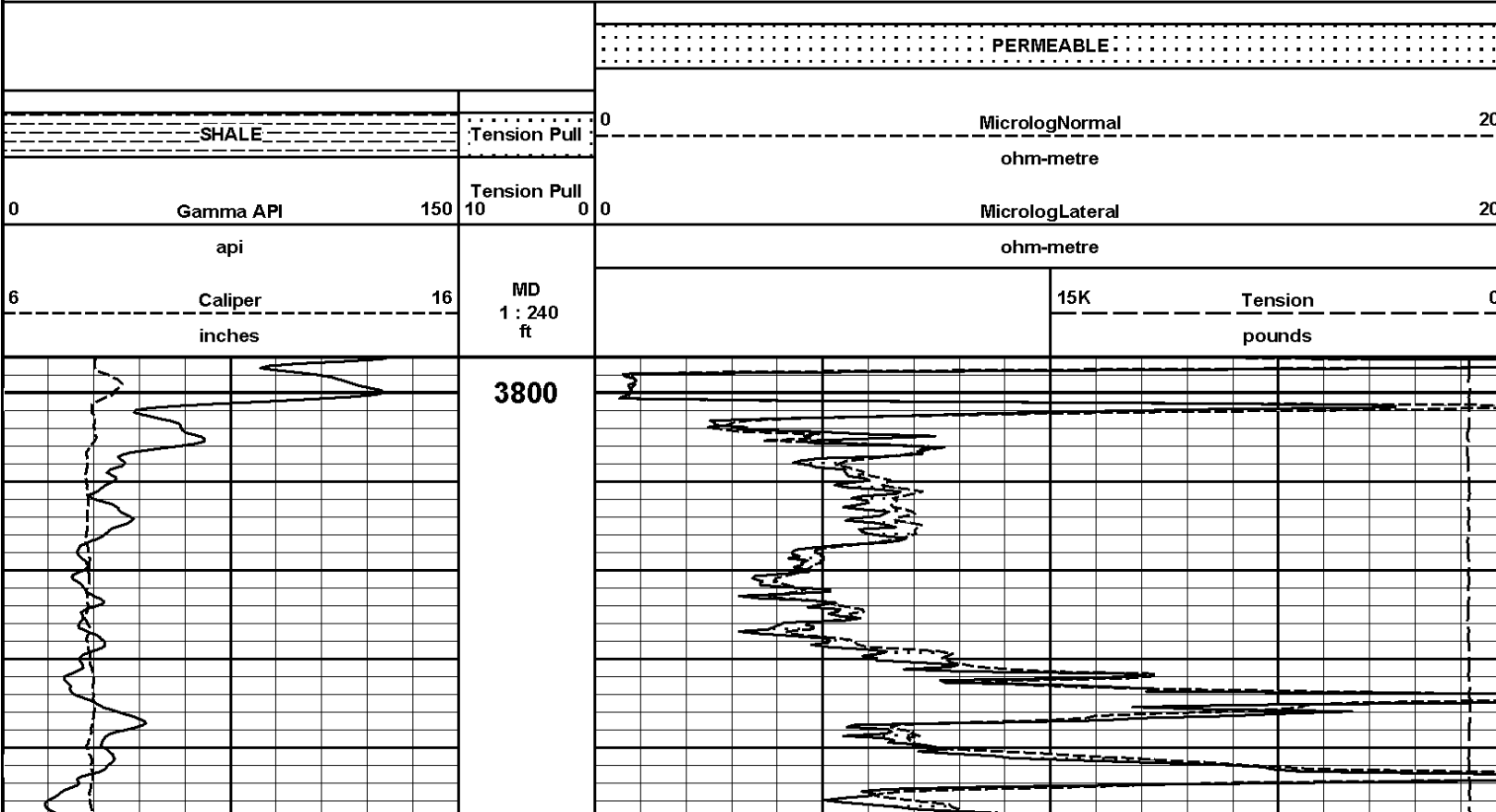
Plot Time: 06-Oct-11 09:07:18

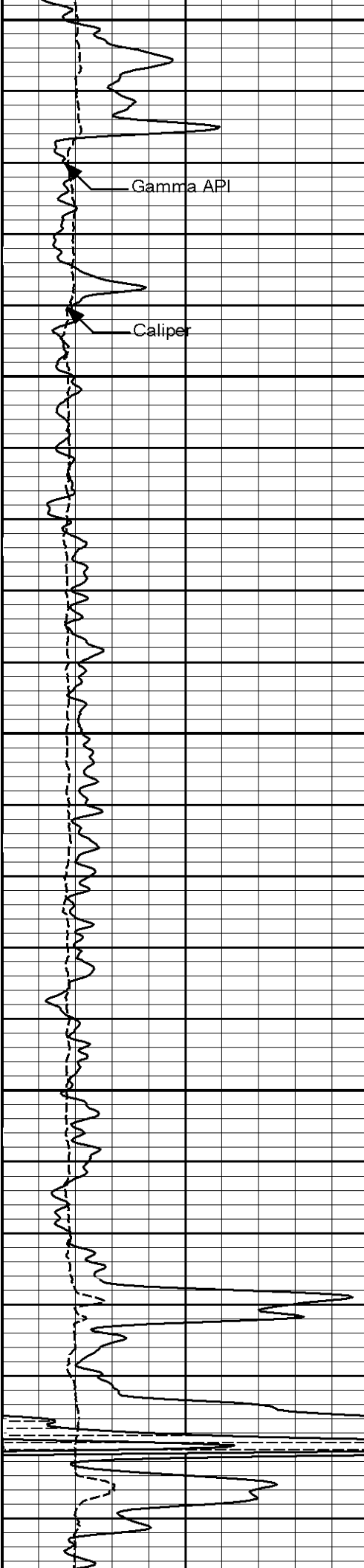
Plot Range: 3796 ft to 4875.92 ft

Data: TODD_3_32\Well Based\DETAIL\

Plot File: \\-LOCAL-\\TODD_3_32\\0001 SP-GTET-DSN-SDL-ACRT-CH\MICRO\Microlog_IQ_5_main_lib

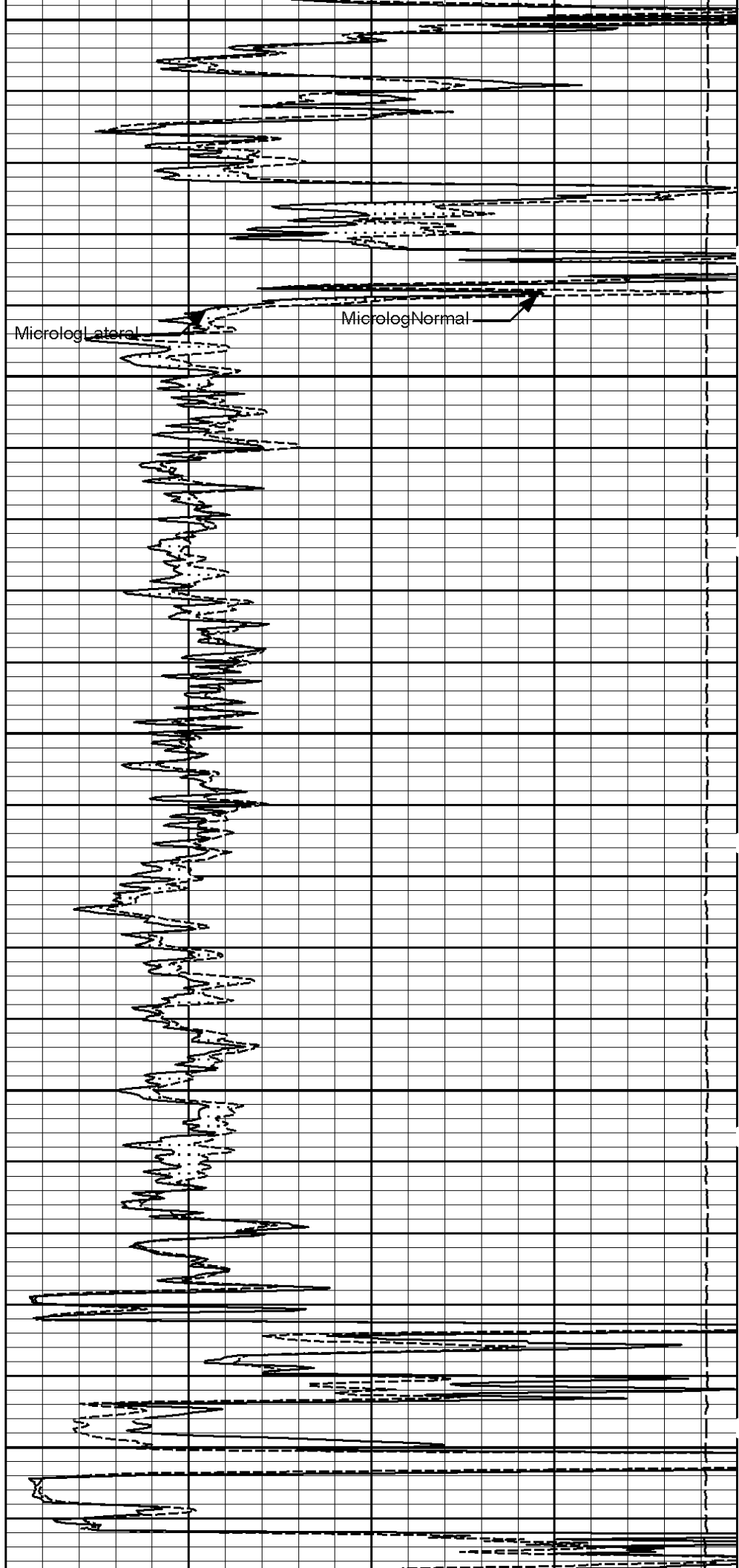
5 INCH MAIN LOG

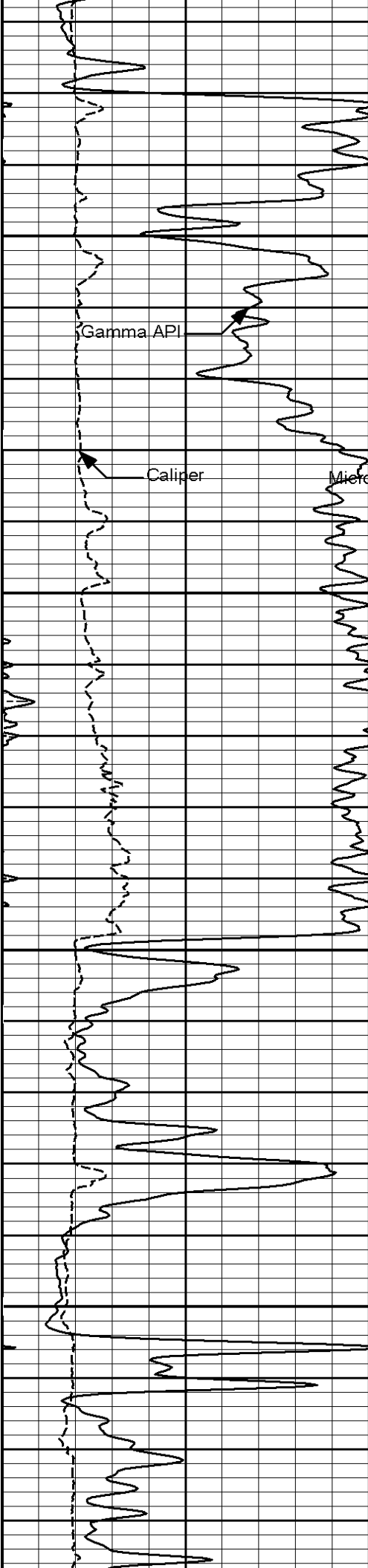




3900

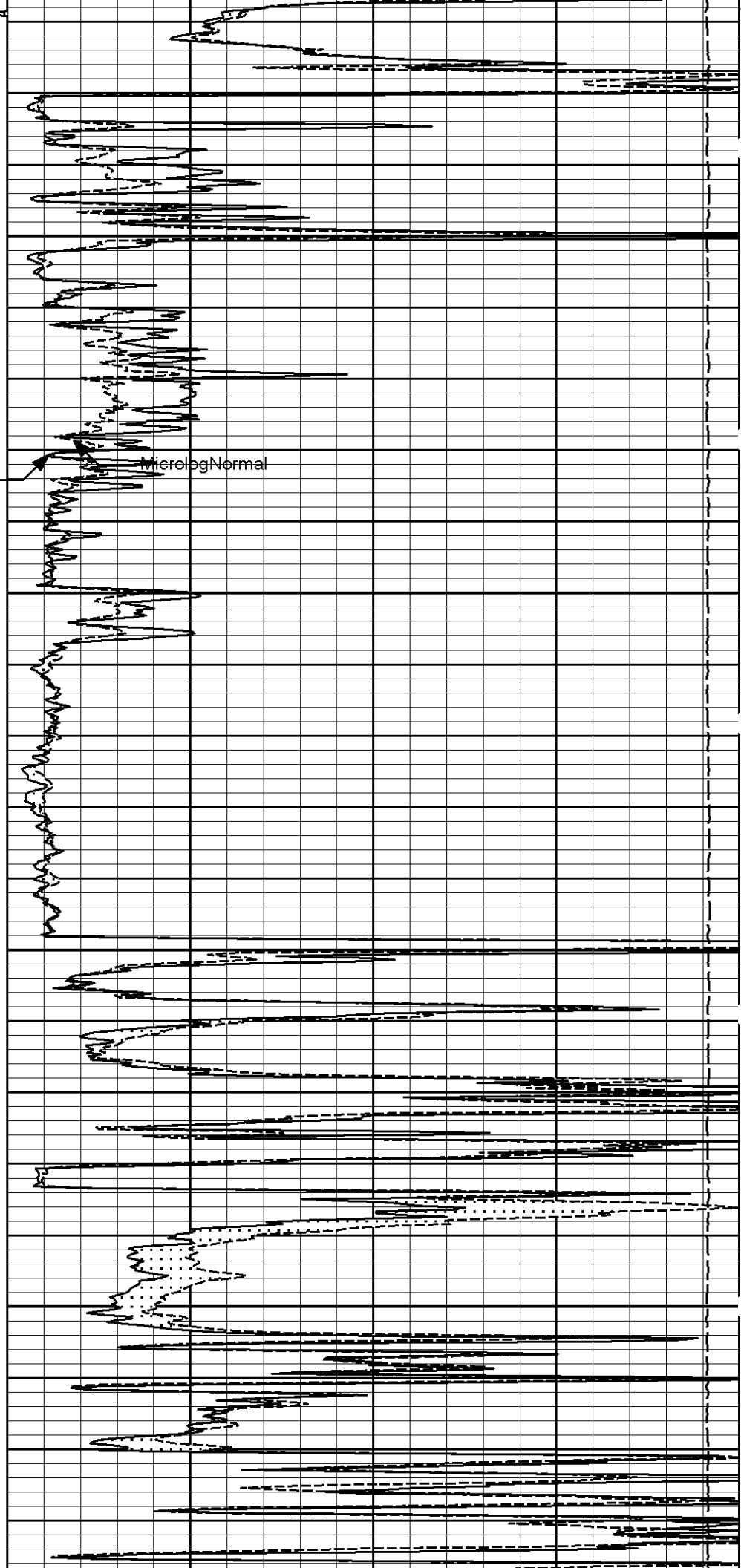
4000

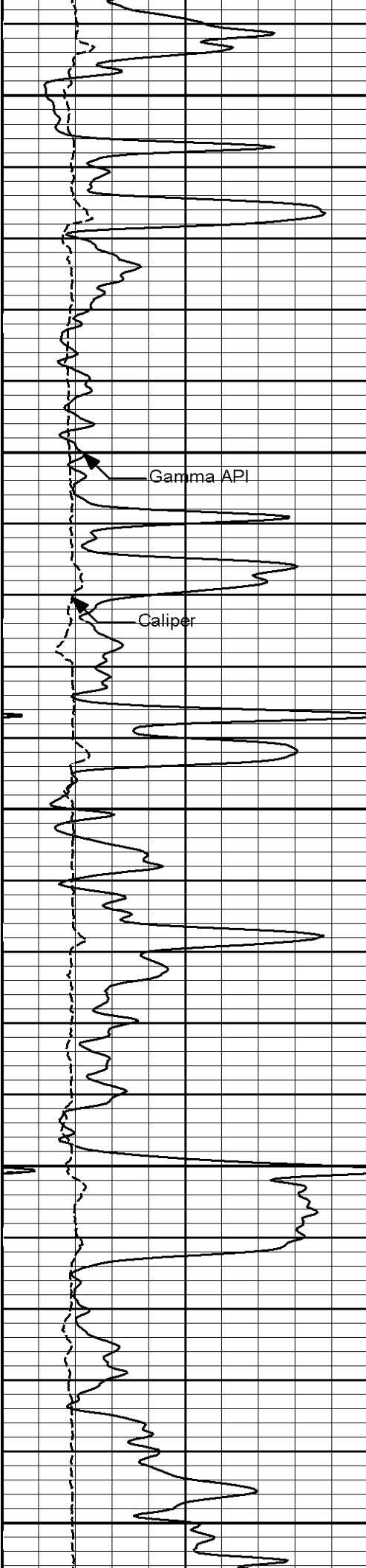




4100

4200





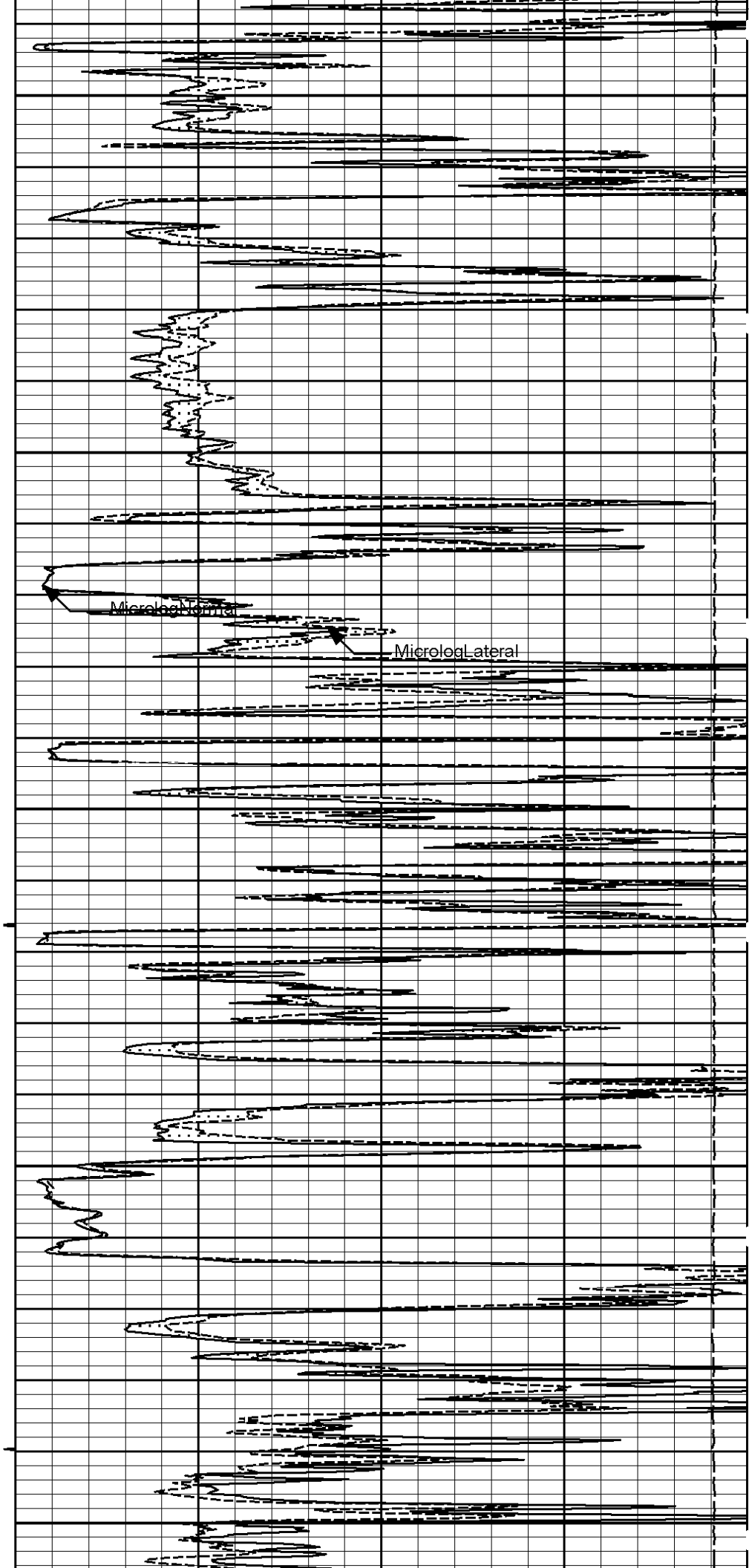
4300

Gamma API

Caliper

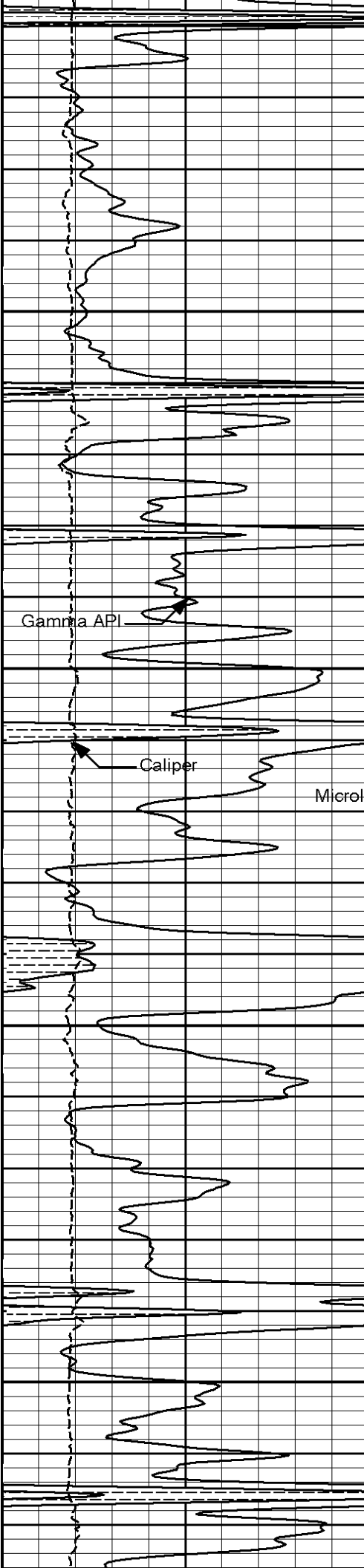
4400

4500



Microlog Normal

Microlog Lateral



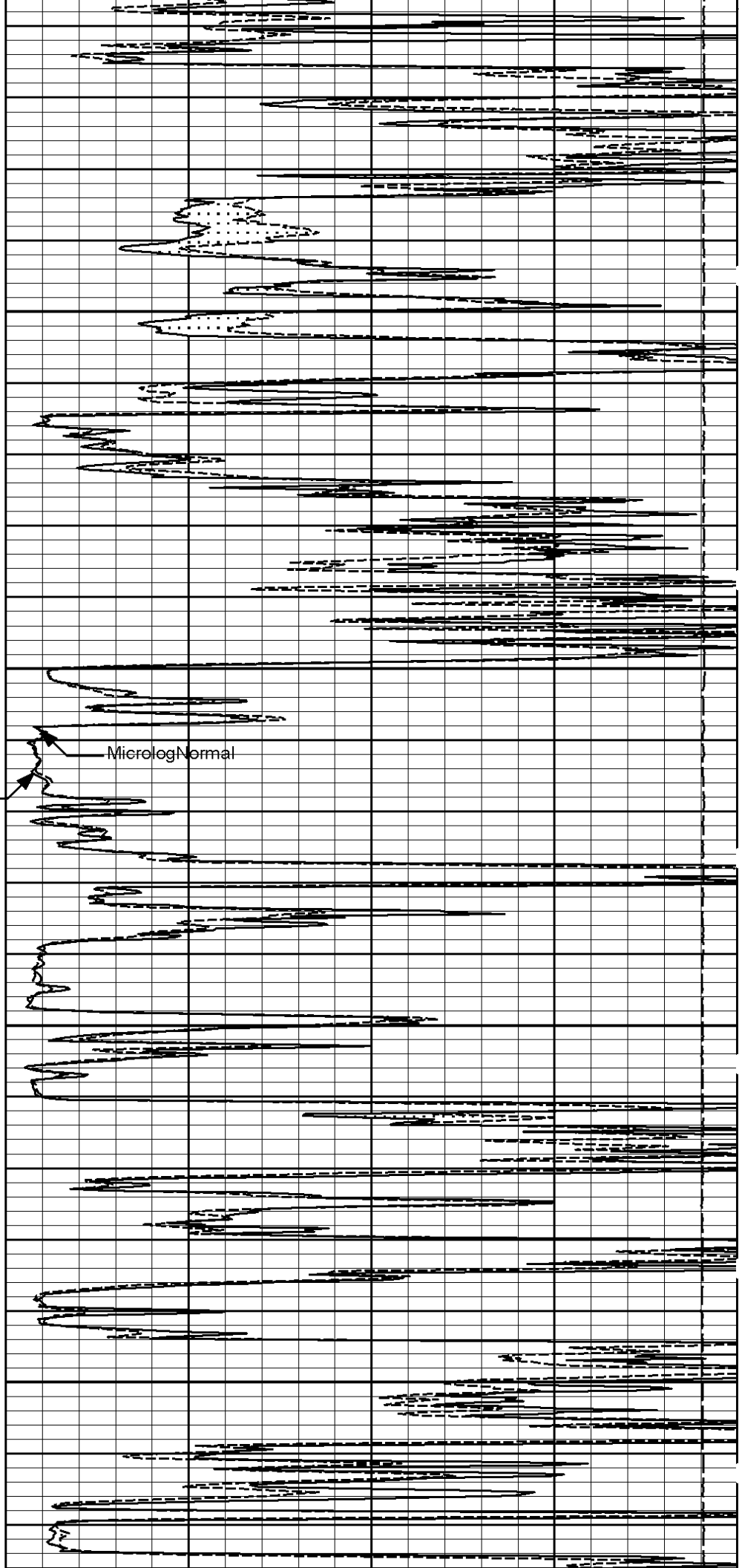
Gamma API

Caliper

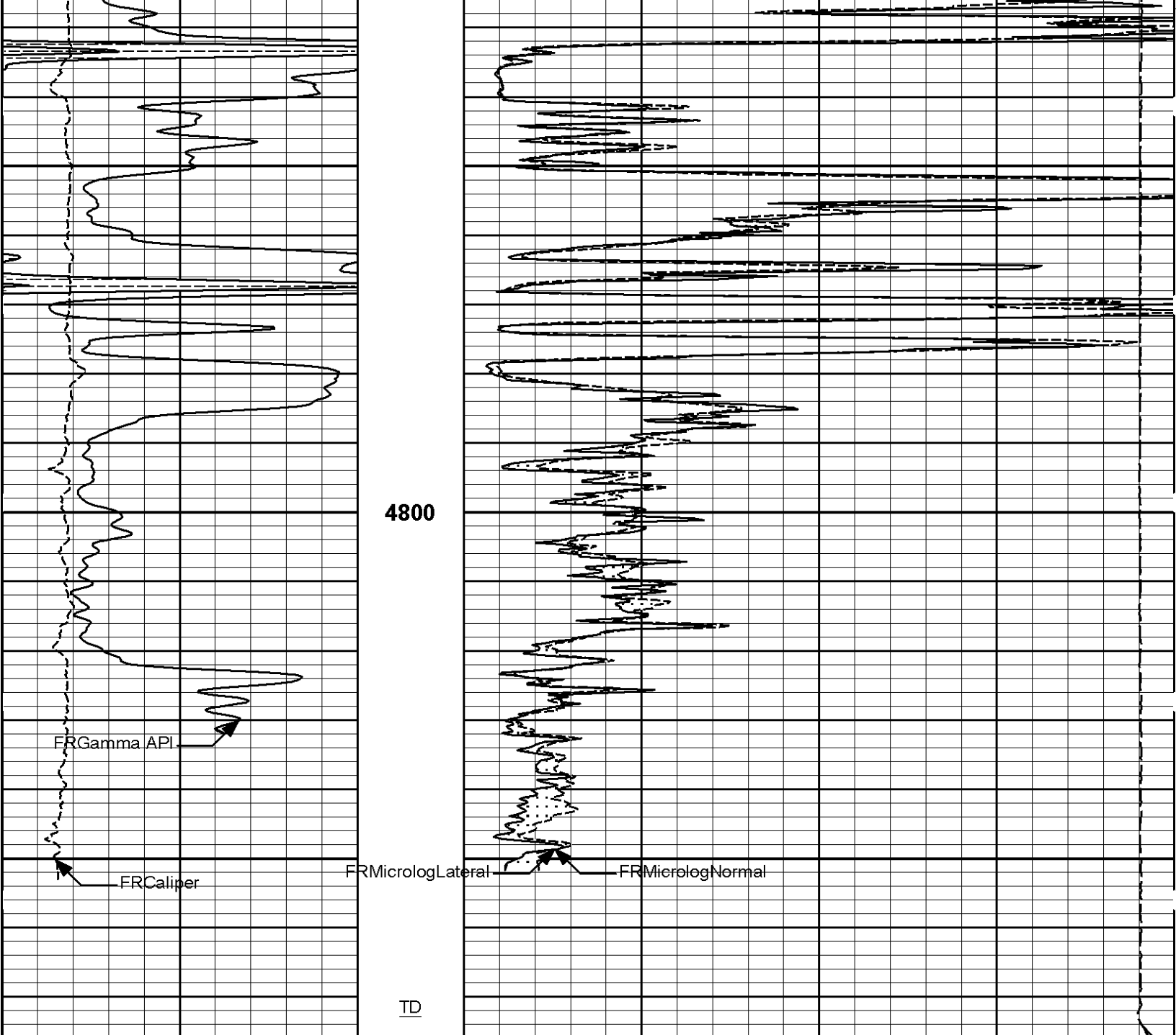
MicrologLateral

4600

4700



MicrologNormal

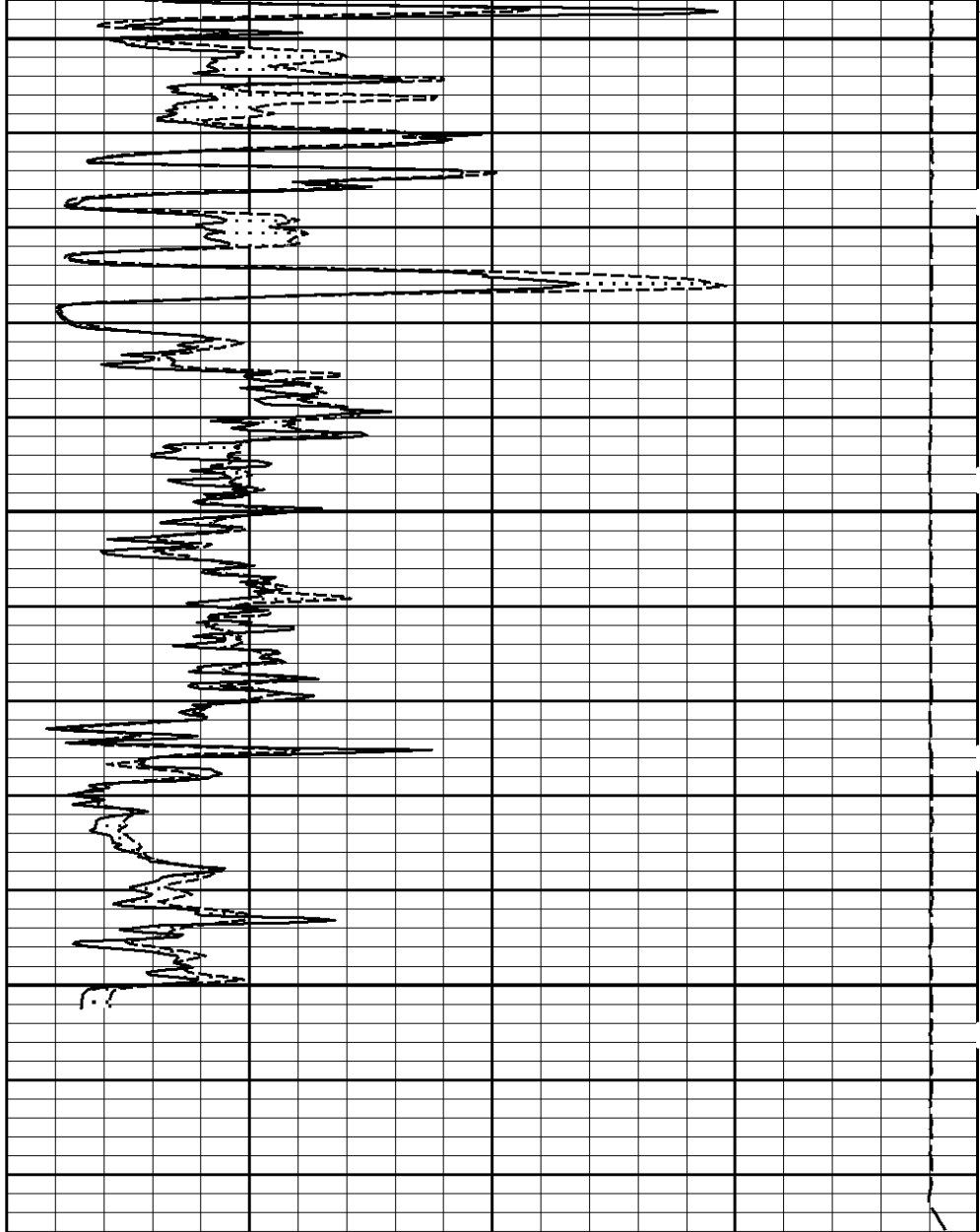


6	Caliper	16	MD	15K	Tension	0
	inches		1 : 240		pounds	
0	Gamma API	150	Tension Pull	0	MicrologLateral	20
	api		10		ohm-metre	
	SHALE		Tension Pull	0	MicrologNormal	20
					ohm-metre	
					PERMEABLE	

		PERMEABLE	
SHALE		0	MicrologNormal 20
0		ohm-metre	
Gamma API 150		0	MicrologLateral 20
api		ohm-metre	
6	Caliper 16	MD 1 : 240 ft	15K Tension 0 pounds
		4600	
		4700	



4800



6	Caliper	16
	inches	
0	Gamma API	150
	api	
	SHALE	

MD
1 : 240
ft

15K	Tension	0
	pounds	
0	MicrologLateral	20
	ohm-metre	
0	MicrologNormal	20
	ohm-metre	
	PERMEABLE	

HALLIBURTON

Plot Time: 06-Oct-11 09:07:22

Plot Range: 4596.75 ft to 4876.42 ft

Data: TODD_3_32\Well Based\REPEAT\

Plot File: \\-LOCAL-\\TODD_3_32\0001 SP-GTET-DSN-SDL-ACRT-CH\MICRO\Microlog_IQ_5_rep_lib

REPEAT SECTION

Description	Overbody Description	O.D.	Diagram	Sensors @ Delays	Length	Accumulated Length
Cable Head- PROT01 30.00 lbs		Ø 3.625 in →			1.92 ft	54.51 ft
SP Sub-001 60.00 lbs		Ø 3.625 in →		← SP @ 50.81 ft	3.74 ft	52.59 ft
GTET-11048627 165.00 lbs		Ø 3.625 in →		← GammaRay @ 42.79 ft	8.52 ft	48.85 ft
DSNT-11019643 174.00 lbs	DSN Decentralizer- 11005605 6.60 lbs	Ø 5.000 in* → Ø 3.625 in →		← DSN Far @ 33.39 ft ← DSN Near @ 32.64 ft	9.69 ft	40.33 ft
SDLT-I43_M469 360.00 lbs	SDLT Pad-I43_P81 65.00 lbs Microlog Pad-I43_P81 8.00 lbs	Ø 4.500 in → Ø 4.750 in* → Ø 4.750 in* →		Microlog @ 22.83 ft SDL Caliper @ 22.65 ft SDL @ 22.64 ft	10.81 ft	30.64 ft
ACRt Instrument- I962_S909 50.00 lbs		Ø 3.625 in →			5.03 ft	19.83 ft
				← Mud Resistivity @ 13.44 ft		14.80 ft
				← ACRt @ 9.46 ft		
ACRt Sonde- I962_S909 200.00 lbs		Ø 3.625 in →			14.22 ft	

Cabbage Head-
TRK696
10.00 lbs

Ø 3.625 in
Ø 6.000 in



0.58 ft
0.00 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	52.59	300.00
SP	SP Sub	001	60.00	3.74	48.85	300.00
GTET	Gamma Telemetry Tool	11048627	165.00	8.52	40.33	60.00
DSNT	Dual Spaced Neutron	11019643	174.00	9.69	30.64	60.00
DCNT	DSN Decentralizer	11005605	6.60	5.13	* 33.97	300.00
SDLT	Spectral Density Tool	I43_M469	360.00	10.81	19.83	60.00
MICP	Microlog Pad	I43_P81	8.00	1.00	* 22.33	60.00
SDLP	Density Insite Pad	I43_P81	65.00	2.55	* 22.04	60.00
ACRt	Array Compensated True Resistivity Instrument Section	I962_S909	50.00	5.03	14.80	300.00
ACRt	Array Compensated True Resistivity	I962_S909	200.00	14.22	0.58	300.00
CBHD	Cabbage Head	TRK696	10.00	0.58	0.00	300.00
Total			1,128.60	54.51		
						* Not included in Total Length and Length Accumulation.
Data: TODD_3_32\0001 SP-GTET-DSN-SDL-ACRT-CH\001 06-Oct-11 07:13 Dn @517.5f						Date: 06-Oct-11 07:26:16

HALLIBURTON

CALIBRATION REPORT

MICRO LOG SHOP CALIBRATION

Tool Name:	Microlog Pad - I43_P81	Reference Calibration Date:	08-Aug-11 18:41:18
Engineer:	S. JUNG	Calibration Date:	11-Sep-11 04:26:30
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	-0.07	-0.07	-0.02	-0.06	ohmm
Calibration Point #1	-0.00	0.00	0.04	0.00	ohmm
Calibration Point #2	19.92	20.00	19.68	20.00	ohmm
Internal Reference	19.84	19.92	19.86	20.19	ohmm

Measurement	Micro Log Normal Tool Value	Micro Log Lateral Tool Value	Units
Tool Zero	0.32	0.53	V
Calibration Point #1	17.90	20.87	V
Calibration Point #2	5358.39	6831.43	V
Internal Reference	5337.48	6894.43	V

MICRO LOG FIELD CHECK

Tool Name:	Microlog Pad - I43_P81	Reference Calibration Date:	11-Sep-11 04:26:30
Engineer:	J. BOSH	Calibration Date:	24-Sep-11 07:48:56
Software Version:	WL INSITE R3.4.2 (Build 2)	Calibration Version:	1

Measurement	Micro Log Normal		Micro Log Lateral		Units
	Shop	Field	Shop	Field	
Tool Zero	-0.07	-0.07	-0.06	-0.06	ohmm
Internal Reference	19.92	19.93	20.19	20.19	ohmm

Summary				
Signal	Shop	Field	Difference	Tolerance
Microlog Normal	19.92	19.93	-0.01	+/- 0.80
Microlog Lateral	20.19	20.19	0.00	+/- 0.80

CALIBRATION SUMMARY						
Sensor	Shop	Field	Post	Difference	Tolerance	Units
Microlog Pad-I43_P81						
MicroLog Normal	19.92	19.93	-----	-0.01	+/-0.80	ohmm
MicroLog Lateral	20.19	20.19	-----	0.00	+/-0.80	ohmm
Data: TODD_3_32\0001 SP-GTET-DSN-SDL-ACRT-CH\IDLE					Date: 06-Oct-11 08:45:48	

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	9.200	ppg
	SHARED	WAGT	Weighting Agent	Natural	
	SHARED	BSAL	Borehole salinity	6100.00	ppm
	SHARED	FSAL	Formation Salinity NaCl	0.00	ppm
	SHARED	KPCT	Percent K in Mud by Weight?	0.00	%
	SHARED	RMUD	Mud Resistivity	0.400	ohmm
	SHARED	TRM	Temperature of Mud	76.0	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	4875.00	ft
	SHARED	BHT	Bottom Hole Temperature	119.0	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 / CrossPlot	XPOK	Process Crossplot?	No	
	Rwa / CrossPlot	RMFR	Rmf Reference	0.47	ohmm
	Rwa / CrossPlot	TMFR	Rmf Ref Temp	62.00	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	DNCO	DSN Standoff, 0.25 in (6.35 mm) Recommended	0.250	in

DSNT	DNSO	DSN Standoff - 0.25 in (0.35 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	
Microlog Pad	MLOK	Process MicroLog 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
ACRt Sonde	RTOK	Process ACRt?	Yes	
ACRt Sonde	MNSO	Minimum Tool Standoff	1.50	in
ACRt Sonde	TCS1	Temperature Correction Source	FP Lwr & FP Up	
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: TODD_3_32\0001 SP-GTET-DSN-SDL-ACRT-CH\IDLE

Date: 06-Oct-11 07:26:49

HALLIBURTON

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		50.81	NO	
SP	Spontaneous Potential		50.81	BLK	1.250
SPR	Raw Spontaneous Potential		50.81	NO	
SPO	Spontaneous Potential Offset		50.81	NO	
GTET					
TPUL	Tension Pull		42.79	NO	
GR	Natural Gamma Ray API		42.79	TRI	1.750
GRU	Unfiltered Natural Gamma Ray API		42.79	NO	
EGR	Natural Gamma Ray API with Enhanced Vertical Resolution		42.79	W	1.416 , 0.750
ACCZ	Accelerometer Z		0.00	BLK	0.083
DEVI	Inclination		0.00	NO	
DSNT					
TPUL	Tension Pull		32.54	NO	
RNDS	Near Detector Telemetry Counts		32.64	BLK	1.417
RFDS	Far Detector Telemetry Counts		33.39	TRI	0.583
DNTT	DSN Tool Temperature		32.64	NO	
DSNS	DSN Tool Status		32.54	NO	
FNDS	Near Detector Telemetry Counts EVR		32.64	BLK	0.083

ERNDD	Near Detector Telemetry Counts EVR	32.64	BLK	0.000
ERFD	Far Detector Telemetry Counts EVR	33.39	BLK	0.000
ENTM	DSN Tool Temperature EVR	32.64	NO	
SDLT				
TPUL	Tension Pull	22.65	NO	
PCAL	Pad Caliper	22.65	TRI	0.250
ACAL	Arm Caliper	22.65	TRI	0.250
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	

Microlog Pad				
TPUL	Tension Pull	22.83	NO	
MINV	Microlog Lateral	22.83	BLK	0.750
MNOR	Microlog Normal	22.83	BLK	0.750

SDLT Pad				
TPUL	Tension Pull	22.64	NO	
NAB	Near Above	22.46	BLK	0.920
NHI	Near Cesium High	22.46	BLK	0.920
NLO	Near Cesium Low	22.46	BLK	0.920
NVA	Near Valley	22.46	BLK	0.920
NBA	Near Barite	22.46	BLK	0.920
NDE	Near Density	22.46	BLK	0.920
NPK	Near Peak	22.46	BLK	0.920
NLI	Near Lithology	22.46	BLK	0.920
NBAU	Near Barite Unfiltered	22.46	BLK	0.250
NLIU	Near Lithology Unfiltered	22.46	BLK	0.250
FAB	Far Above	22.81	BLK	0.250
FHI	Far Cesium High	22.81	BLK	0.250
FLO	Far Cesium Low	22.81	BLK	0.250
FVA	Far Valley	22.81	BLK	0.250
FBA	Far Barite	22.81	BLK	0.250
FDE	Far Density	22.81	BLK	0.250
FPK	Far Peak	22.81	BLK	0.250
FLI	Far Lithology	22.81	BLK	0.250
PTMP	Pad Temperature	22.65	BLK	0.920
NHV	Near Detector High Voltage	22.04	NO	
FHV	Far Detector High Voltage	22.04	NO	
ITMP	Instrument Temperature	22.04	NO	
DDHV	Detector High Voltage	22.04	NO	

Data: TODD_3_32\0001 SP-GTET-DSN-SDL-ACRT-CH1DLE

Date: 06-Oct-11 07:27:00

COMPANY	STRATA EXPLORATION		
WELL	TODD 3-32		
FIELD	EINSEL		
COUNTY	KIOWA	STATE	KANSAS
HALLIBURTON		MICROLOG	