

017-09288

HALLIBURTON

HIGH RESOLUTION  
INDUCTION  
LOG

DELTA PETROLEUM CORPORATION  
NORTH VEGA 27-431  
MESA CO

VEGA FIELD TYPE LOG 077-09288

COGCC Document Number 2056082

04-18-2016

COMPANY DELTA PETROLEUM CORPORATION  
WELL NORTH VEGA 27-431  
FIELD VEGA  
COUNTY MESA  
STATE CO

RECEIVED  
MAR 28 2008  
STATE CO  
COGCC  
SDLTDSN

COMPANY  
WELL  
FIELD  
COUNTY  
STATE

Permanent Datum GROUND LEVEL  
Log measured from KELLY BUSHING  
Drilling measured from KELLY BUSHING  
Date 03-Aug-07 14:42:23  
Run No. ONE  
Depth - Driller 8960.0 ft  
Depth - Logger 8973.0 ft  
Bottom - Logged Interval 8963.0 ft  
Top - Logged Interval CASING  
Casing - Driller 8.625 in @ 2043.0 ft  
Casing - Logger 2044.0 ft  
Bit Size 7.875 in  
Type Fluid in Hole LSND  
Density 9.4 ppG  
PH 9.00  
Source of Sample FLOWLINE  
Rm @ Meas. Temperature 1.77 ohmm @ 78.00 degF  
Rmf @ Meas. Temperature 1.87 ohmm @ 73.00 degF  
Rmc @ Meas. Temperature 2.03 ohmm @ 73.00 degF  
Source Rmf MEAS Rmc MEAS  
Rm @ BHT 0.68 ohmm @ 213.0 degF  
Time Since Circulation 6.8 hr  
Time on Bottom 04-Aug-07 18:15:51  
Max. Rec. Temperature 213.0 degF @ 8973.0 ft  
Equipment Location 10549595 FMTN.  
Recorded By L. SMITH  
Witnessed By R. BOYLE

Permanent Datum	GROUND LEVEL	Elev. 7720.0 ft	Elev. K.B. 7737.5 ft
Log measured from	KELLY BUSHING	17.5 ft above perm. Datum	D.F. 7736.5 ft
Drilling measured from	KELLY BUSHING		G.L. 7720.0 ft
Date	03-Aug-07 14:42:23		
Run No.	ONE		
Depth - Driller	8960.0 ft		
Depth - Logger	8973.0 ft		
Bottom - Logged Interval	8963.0 ft		
Top - Logged Interval	CASING		
Casing - Driller	8.625 in @ 2043.0 ft		
Casing - Logger	2044.0 ft		
Bit Size	7.875 in		
Type Fluid in Hole	LSND		
Density	9.4 ppG	46.00 spG	
PH	9.00	6 cpH	
Source of Sample	FLOWLINE		
Rm @ Meas. Temperature	1.77 ohmm @ 78.00 degF		
Rmf @ Meas. Temperature	1.87 ohmm @ 73.00 degF		
Rmc @ Meas. Temperature	2.03 ohmm @ 73.00 degF		
Source Rmf	MEAS		
Rmc	MEAS		
Rm @ BHT	0.68 ohmm @ 213.0 degF		
Time Since Circulation	6.8 hr		
Time on Bottom	04-Aug-07 18:15:51		
Max. Rec. Temperature	213.0 degF @ 8973.0 ft		
Equipment Location	10549595 FMTN.		
Recorded By	L. SMITH		
Witnessed By	R. BOYLE		

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Service Ticket No.: 5276259		API Serial No.: 050770928800		PGM Version: WL INSITE R1.8 (Build 6)			
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	HRI-1133S008	N/A	1.5" S.O.	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.	ONE	Run No.	ONE
Serial No.	A070	Serial No.		Serial No.	I380P049	Serial No.	108721
Model No.	NGRT	Model No.		Model No.	SDL_DC	Model No.	DSN_II
Diameter	3.625"	No. of Cent.		Diameter	4.0"	Diameter	3.625"
Detector Model No.	102-A	Spacing		Log Type	GAM-GAM	Log Type	NEU-NEU
Type	SCINT.			Source Type	Cs137	Source Type	Am241Be
Length	4"	LSA [Y/N]		Serial No.	2647 GW	Serial No.	DSN_34
Distance to Source	10'	FWDA [Y/N]		Strength	1.5 Ci	Strength	18.5 Ci

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	T.D.	CSG.	REC.	0	200				30%	-10%	2.68 g/cc	30%	-10%	SAND.

VEGA FIELD TYPE LOG 077-09288

DIRECTIONAL INFORMATION

Maximum Deviation	@	KOP	@
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Remarks: HRI-SDL-DSN-GR RAN IN COMBINATION.  
 ANNULAR HOLE VOLUME CALCULATED FOR 4.5" CASING.  
 ANNULAR HOLE VOLUME = 2790 FT3.  
 CHLORIDES REPORTED AT 700 mg/L.  
 BOREHOLE RUGOSITY, TENSION PULLS AND WASHOUTS MAY AFFECT TOOL RESPONSE.  
 INDCTION ANOMALIES AT 7535', 7670', 7720', AND 7740' REPEATED ON DOWNLOG.

LATITUDE: 39° 14' N // LONGITUDE: 107° 44' N.  
 TODAY'S CREW: R. RUSSELL & W. KENNEDY. RIG: DHS #6.  
 THANK YOU FOR CHOOSING HALLIBURTON ENERGY SERVICES, FARMINGTON, NM.

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.

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## 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	MDWT	Borehole Fluid Weight	9.400	ppg
	SHARED	RMUD	Mud Resistivity	1.770	ohmm
	SHARED	TRM	Temperature of Mud	78.0	degF
	SHARED	OBM	Oil Based Mud System?	No	
	SHARED	ICOD	AHV Casing OD	4.500	in
	SHARED	CSD	Logging Interval is Cased?	No	
	SHARED	CSOD	Casing OD size	4.500	in
	SHARED	CSWT	Casing Weight	17.00	lbpf
	SHARED	ST	Surface Temperature	75.0	degF
	SHARED	TD	Total Well Depth	10000.00	ft
	SHARED	BHT	Bottom Hole Temperature	200.0	degF
	SHARED	CSOD	Outer Casing OD size	8.500	in
	SHARED	CSWT	Outer Casing Weight	17.00	lbpf
	Rwa / CrossPlot	XPOK	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 /	RMER	Rmf Reference	0.10	ohmm

CrossPlot	Rmf Ref Temp	75.00	degF
Rwa / CrossPlot	TMFR		
NGRT	GROK	Process Gamma Ray?	Yes
NGRT	GRSO	Gamma Tool Standoff	0.000 in
NGRT	GEOK	Process Gamma Ray EVR?	No
DSN_II	DNOK	Process DSN?	Yes
DSN_II	DEOK	Process DSN EVR?	No
DSN_II	BHOL	Use DSN Bad Hole Correction?	No
DSN_II	NLIT	Neutron Lithology	Sandstone
DSN_II	DNNO	DSN Tool Standoff	0.000 in
DSN_II	TMPC	Temperature Correction Type	None
DSN_II	DPRS	DSN Pressure Correction Type	None
SDL_DC	DNOK	Process Density?	Yes
SDL_DC	DNOK	Process Density EVR?	No
SDL_DC	AD	Is Hole Air Drilled?	No
SDL_DC	CB	Use Calibration Blocks?	No
SDL_DC	SPVT	SDLT Pad Temperature Valid?	Yes
SDL_DC	MDTP	Weighted Mud Correction Type?	None
SDL_DC	DMA	Formation Density Matrix	2.680 g/cc
SDL_DC	DFL	Formation Density Fluid	1.000 g/cc
SDL_DC	CLOK	Process Caliper Outputs?	Yes
HRID-SP	HRE	Do HRI Induction Calculation?	Yes
HRID-SP	DFLE	Do DFL Calculation?	Yes
HRID-SP	PYRI	Pyrite Switch	Off
HRID-SP	CSDP	Casing Depth	2010.0 ft
HRID-SP	HDSP	Spike Reduction Filter Type	DELTA
HRID-SP	HRTC	Temperature Correction Source	None
HRID-SP	MMRS	Hrimap Minimum Resistivity	0.20
HRID-SP	MXRS	Hrimap Maximum Resistivity	200.00

BOTTOM

Data: DELT\_VEGA\_27431\0002 D4TS-NGRT-DSN-SDL-HRI-TEMPSUB\004 04-Aug-07 18:16 Up @8980.8f

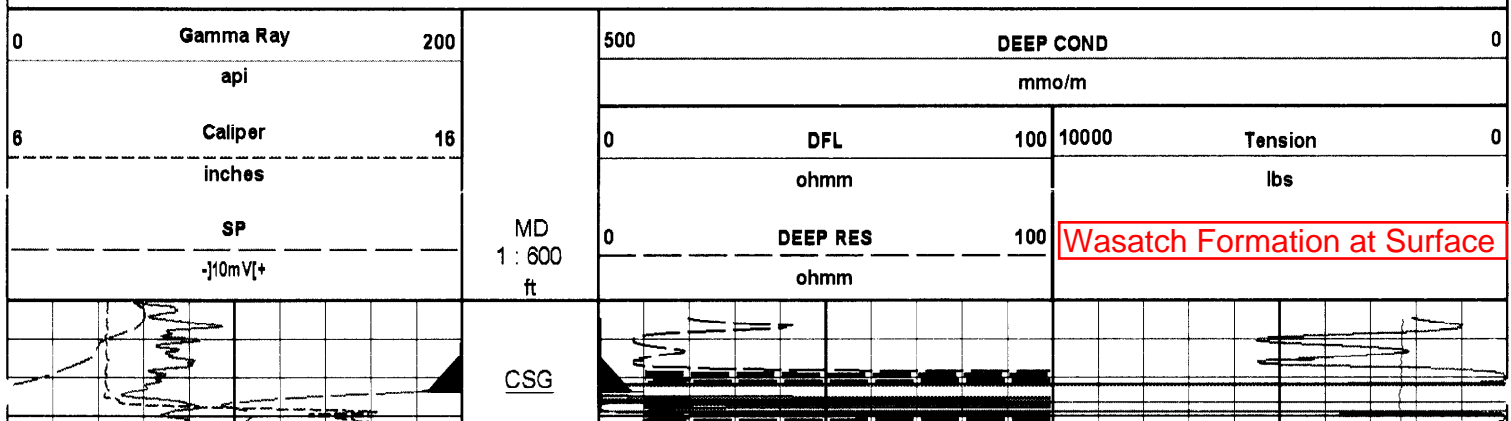
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**HALLIBURTON**

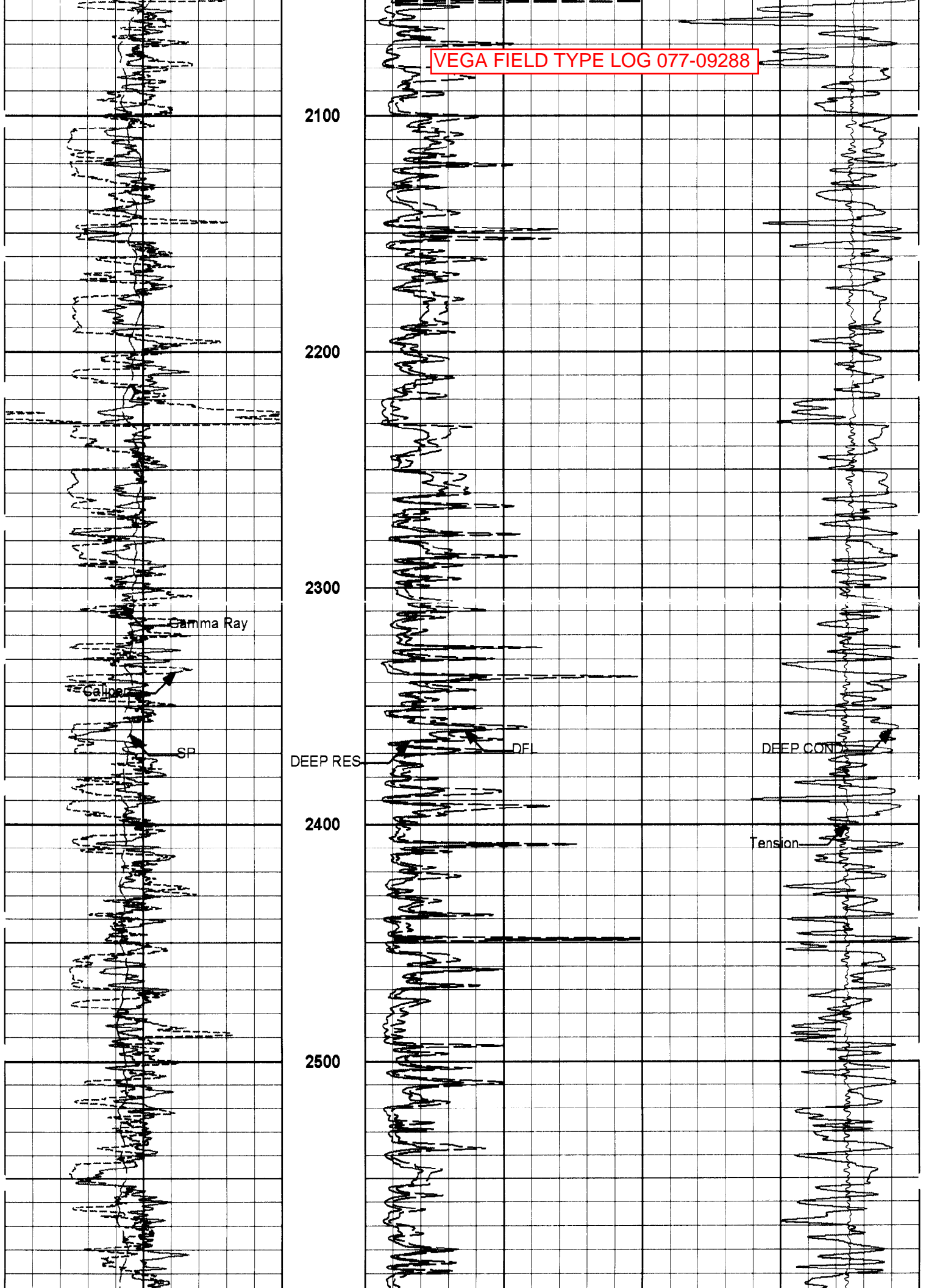
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 Plot Range: 2020 ft to 8980 ft  
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 Plot File: \\IND\DELTA\_2IN\_IND\_COND

**INDUCTION - CONDUCTIVITY PRESENTATION  
 MAIN LOG SECTION  
 2" = 100'**

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2600  
2700  
2800  
2900  
3000  
3100

COGCC pick for  
Wasatch G Sand top  
(upper interval)

COGCC pick for  
Wasatch G Sand top  
(lower interval)

Gamma Ray

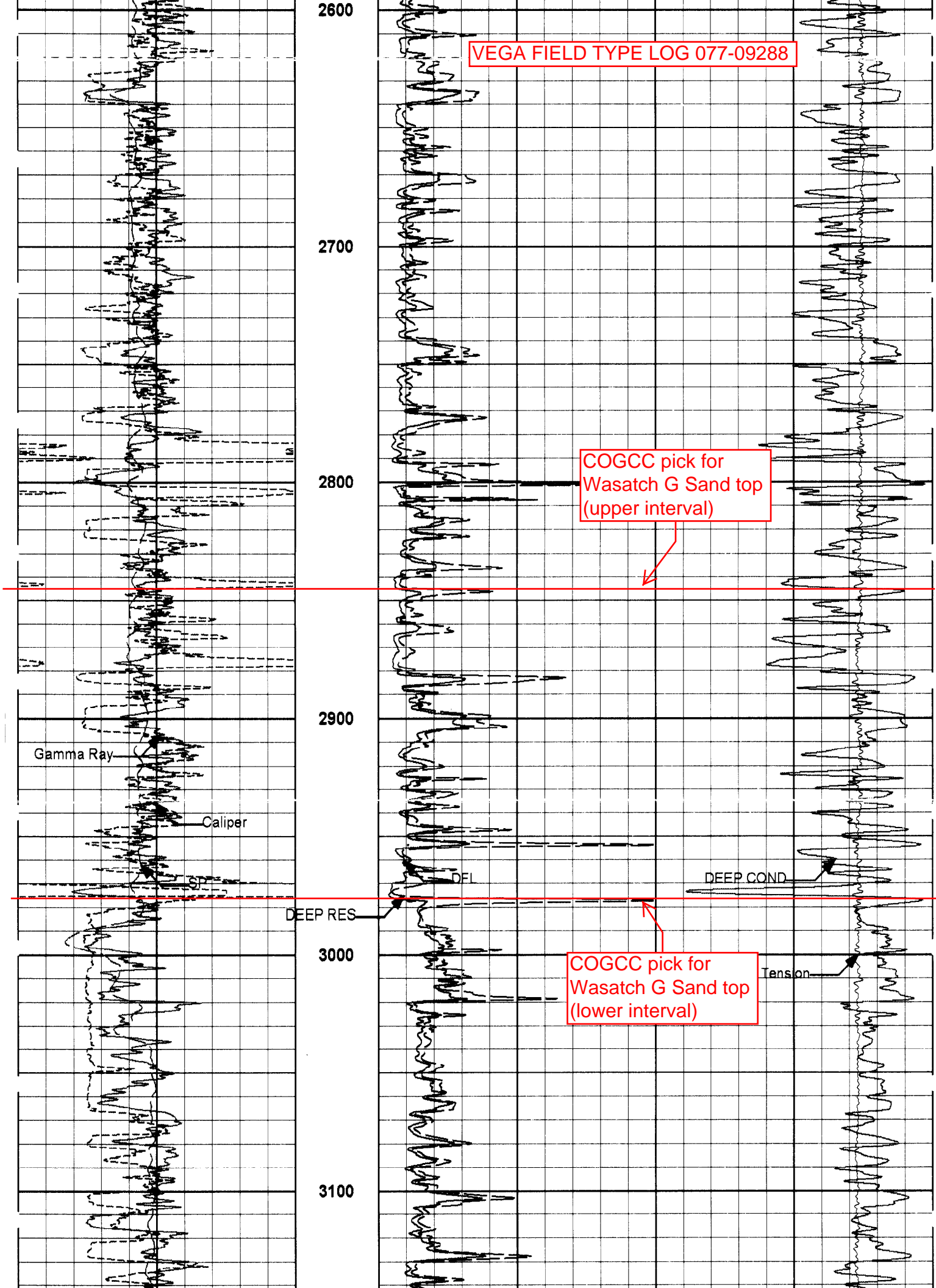
Caliper

DEEP RES

DFI

DEEP COND

Tension



VEGA FIELD TYPE LOG 077-09288

3200

3300

3400

3500

3600

Gamma Ray

Caliper

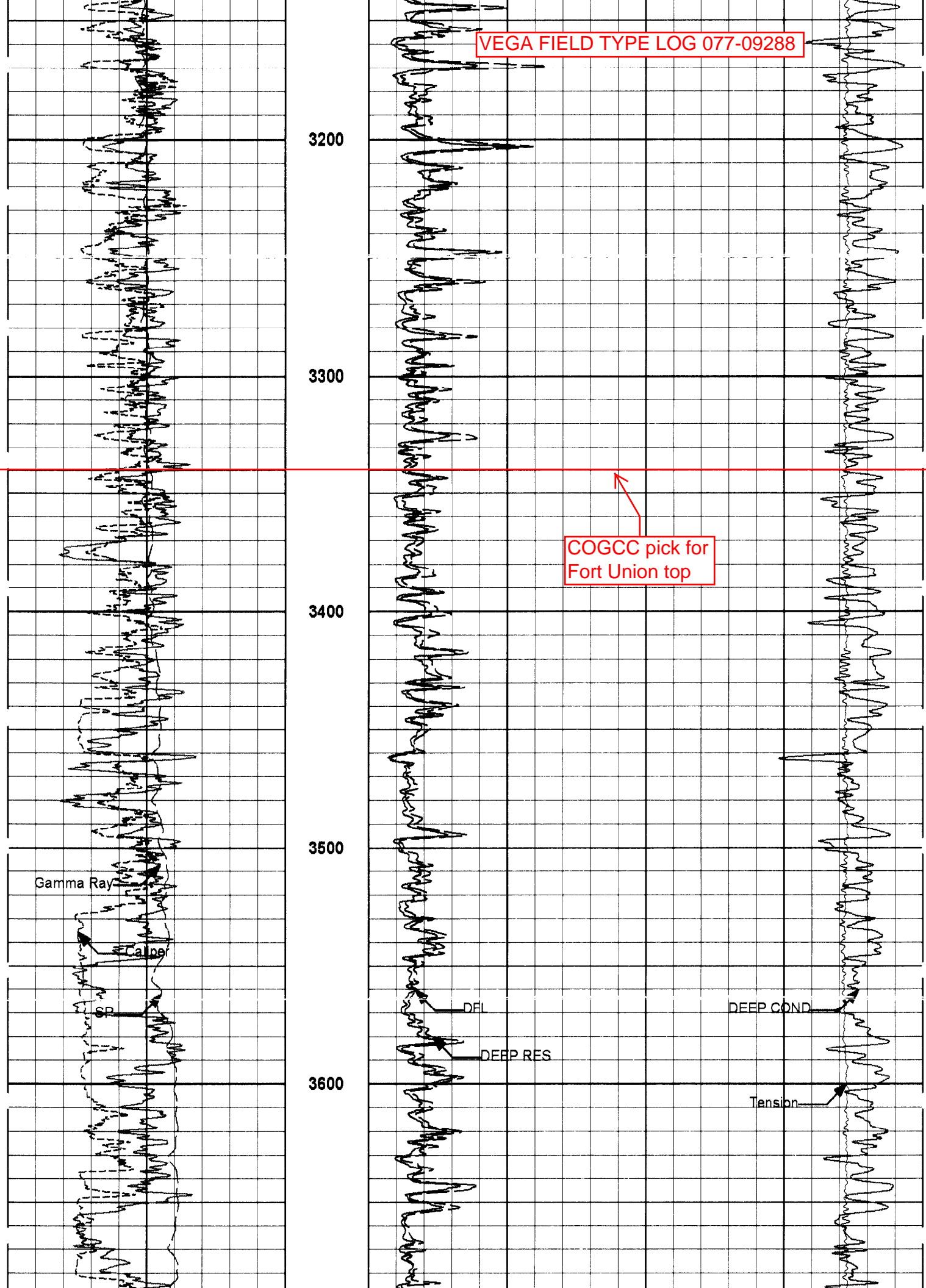
DFI

DEEP RES

DEEP COND

Tension

COGCC pick for Fort Union top



VEGA FIELD TYPE LOG 077-09288

3700

3800

3900

4000

4100

4200

Gamma Ray

Caliper

SP

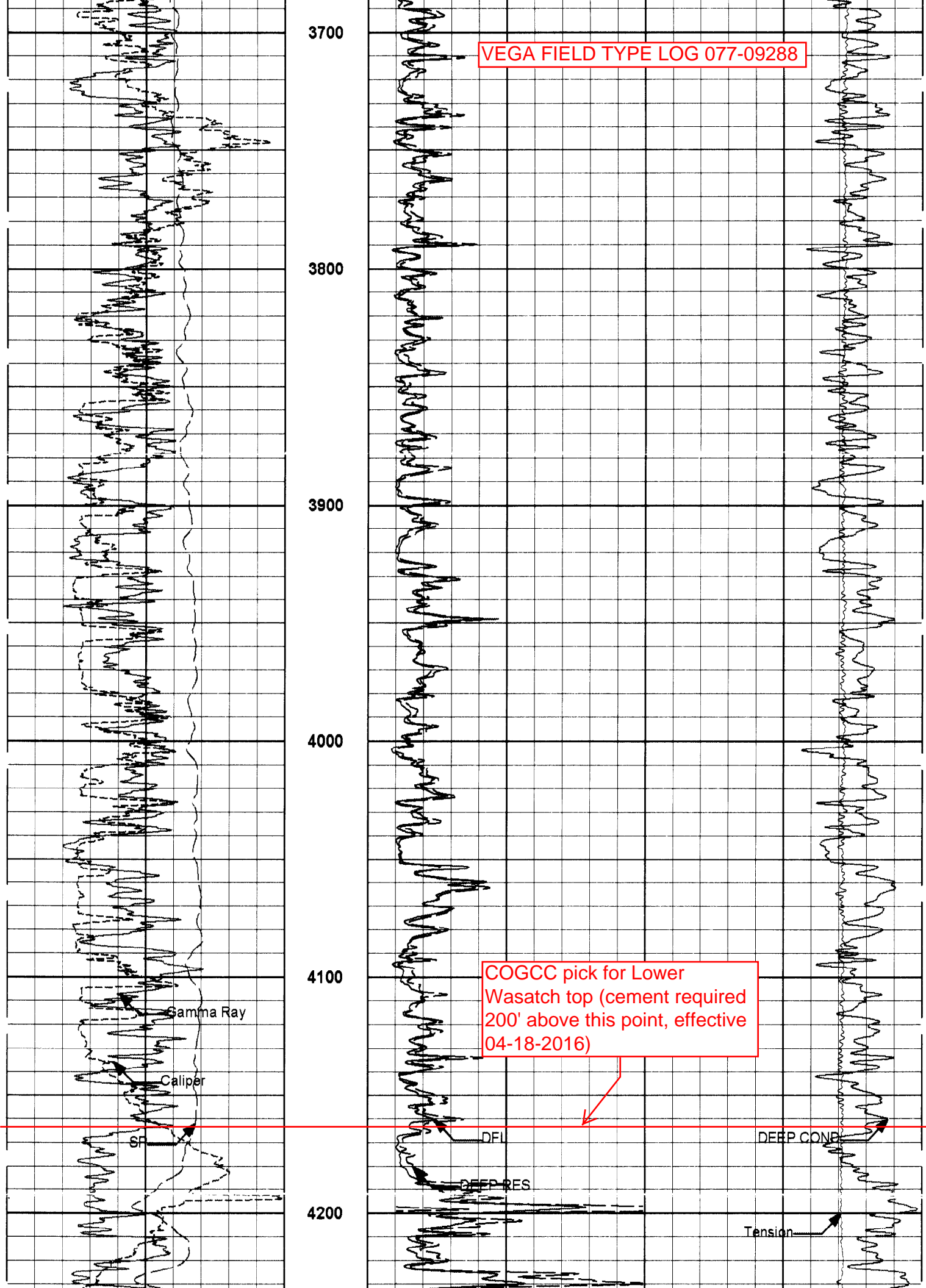
COGCC pick for Lower Wasatch top (cement required 200' above this point, effective 04-18-2016)

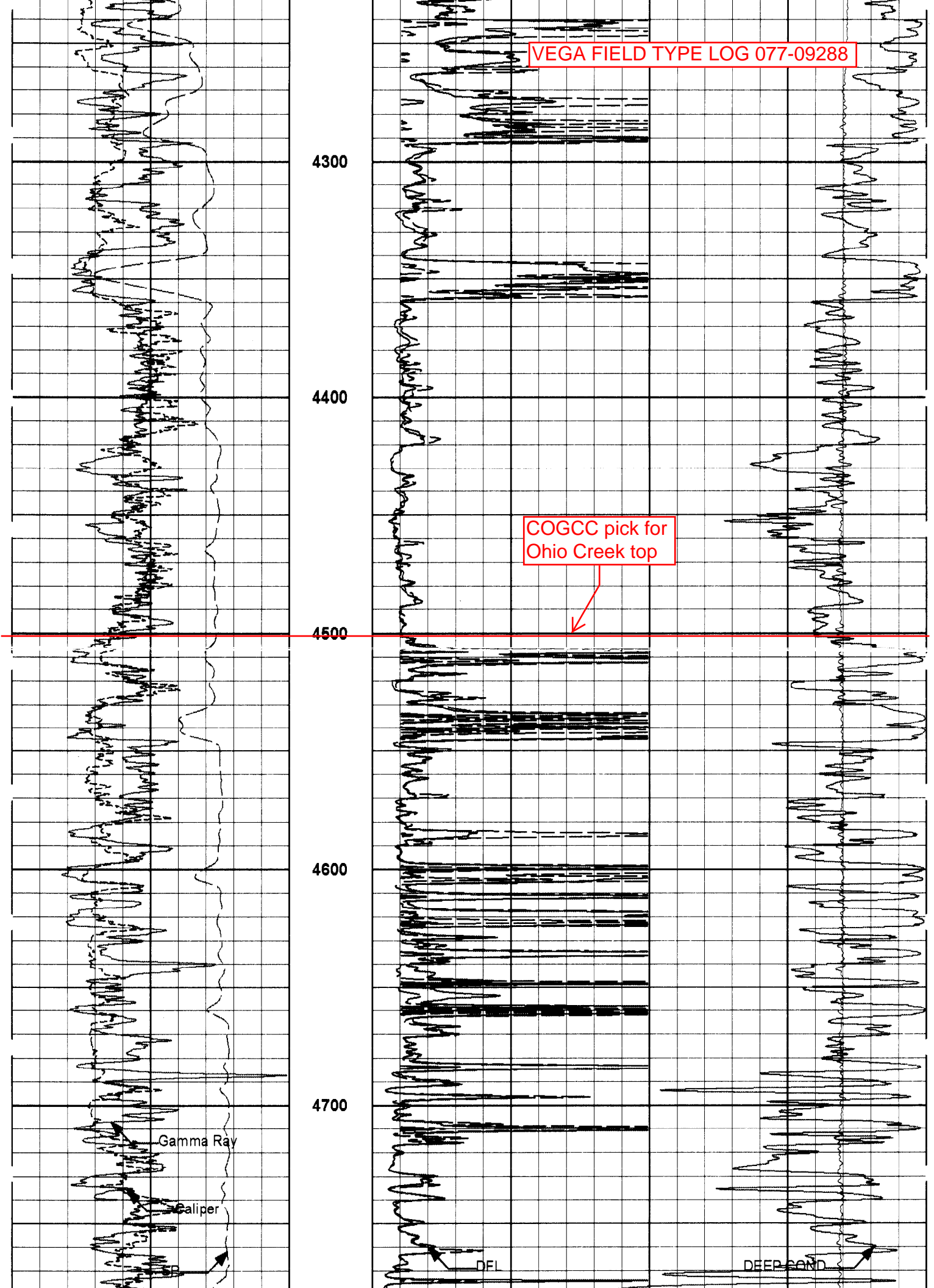
DFI

DEEP COND

DEEP RES

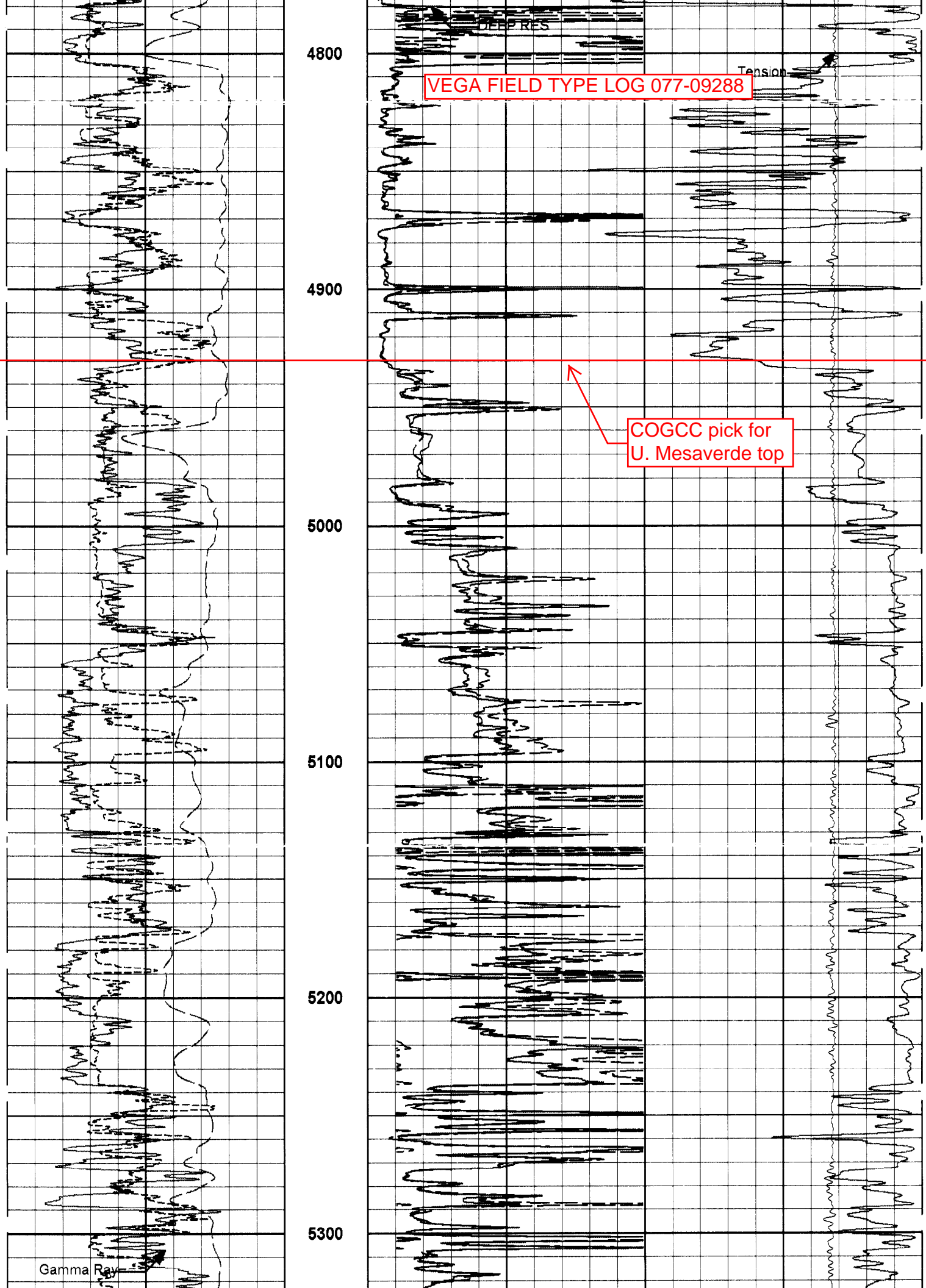
Tension







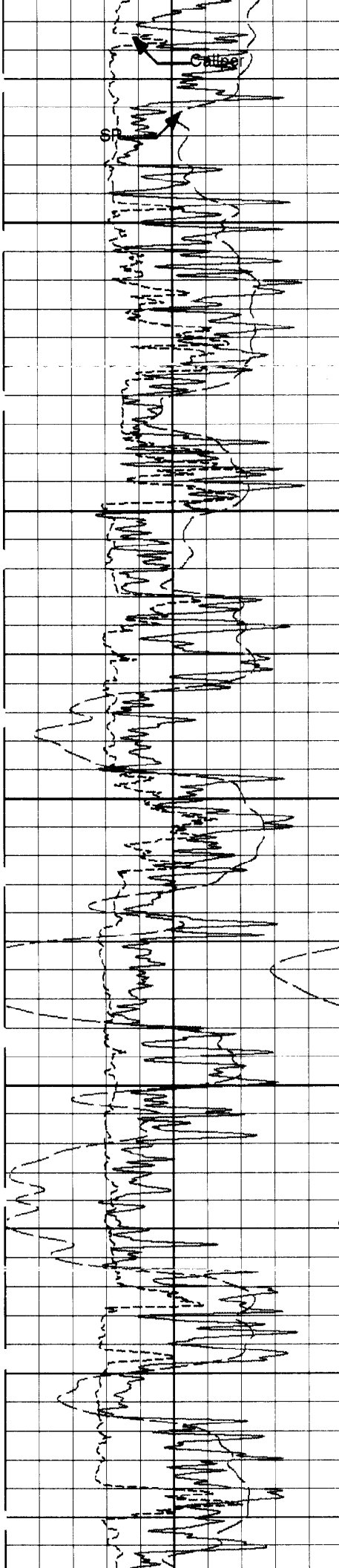
VEGA FIELD TYPE LOG 077-09288



COGCC pick for U. Mesaverde top

Gamma Ray

VEGA FIELD TYPE LOG 077-09288



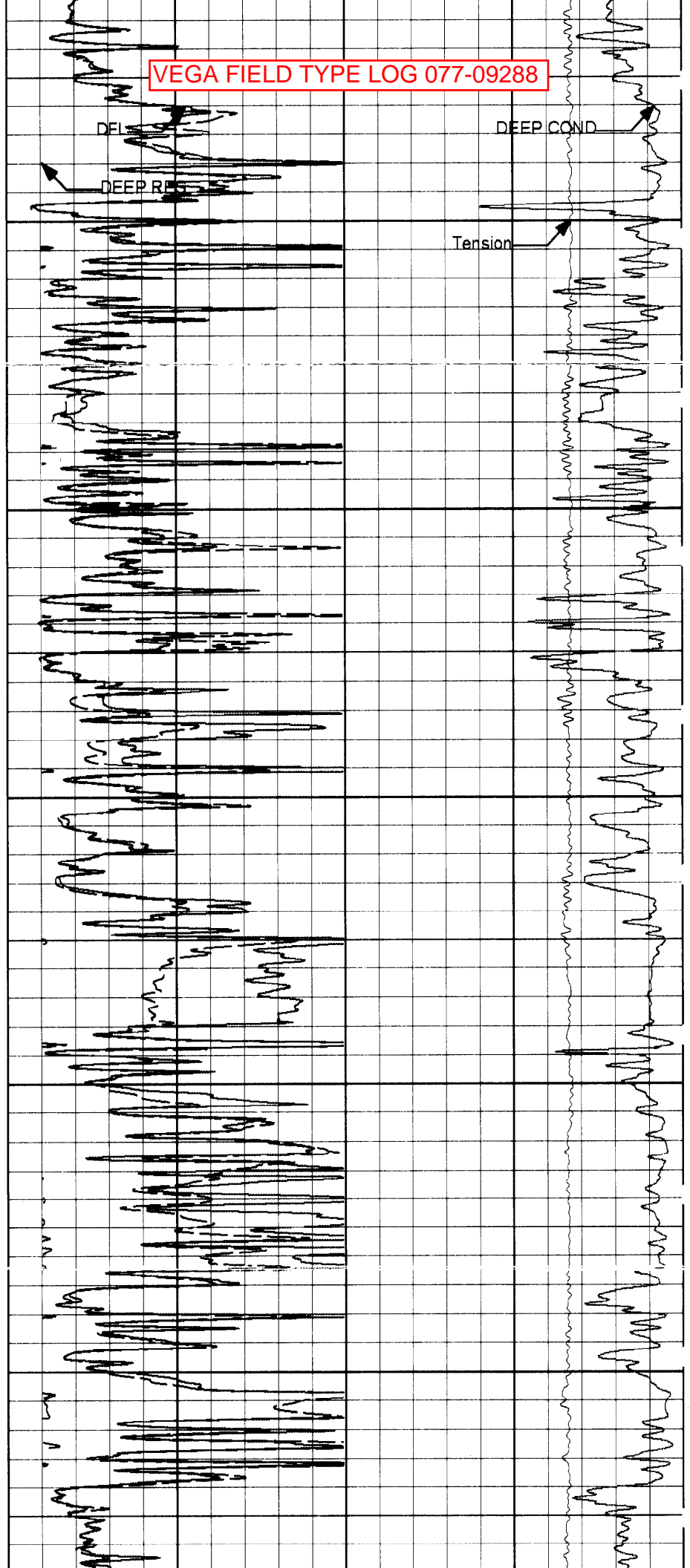
5400

5500

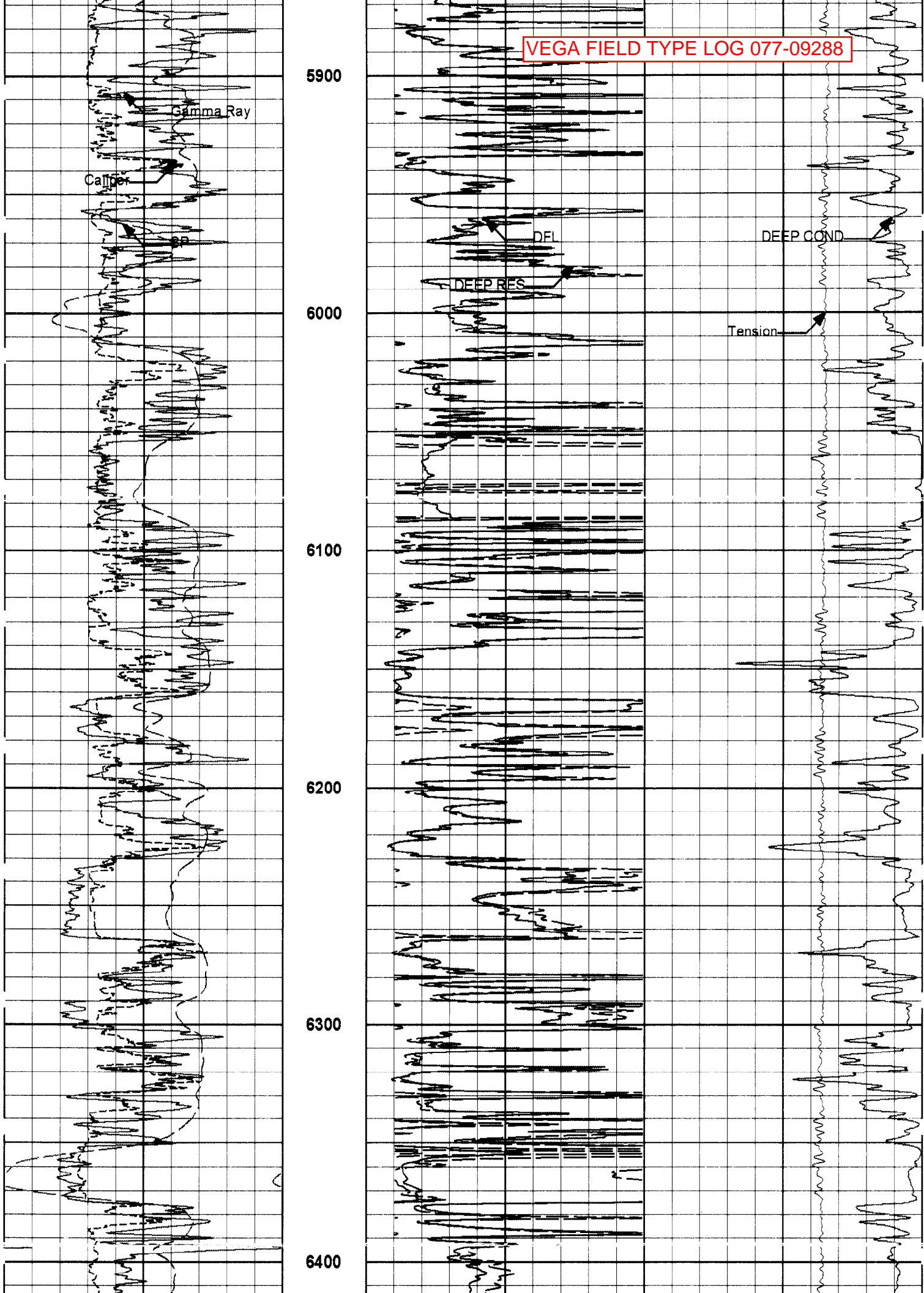
5600

5700

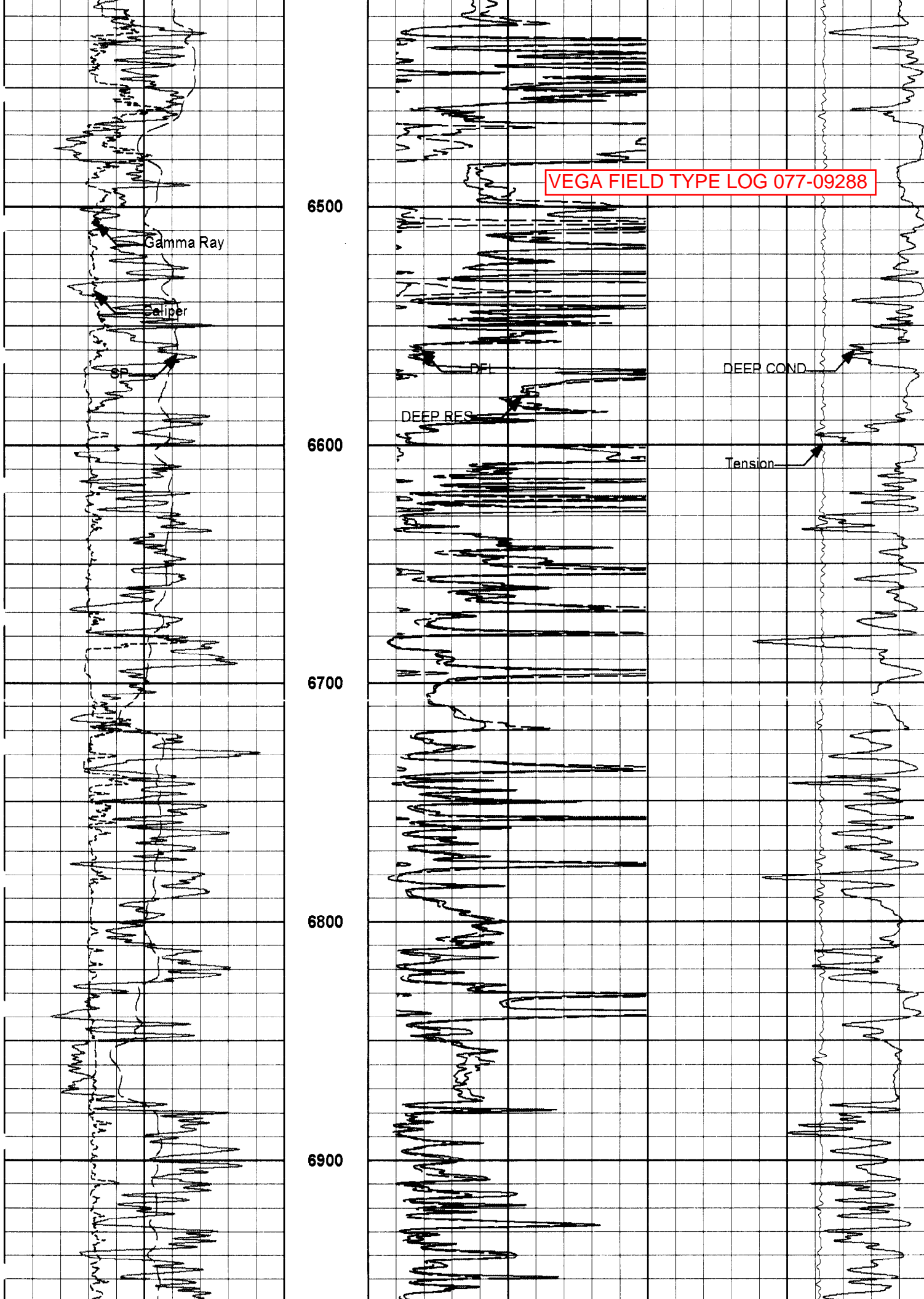
5800



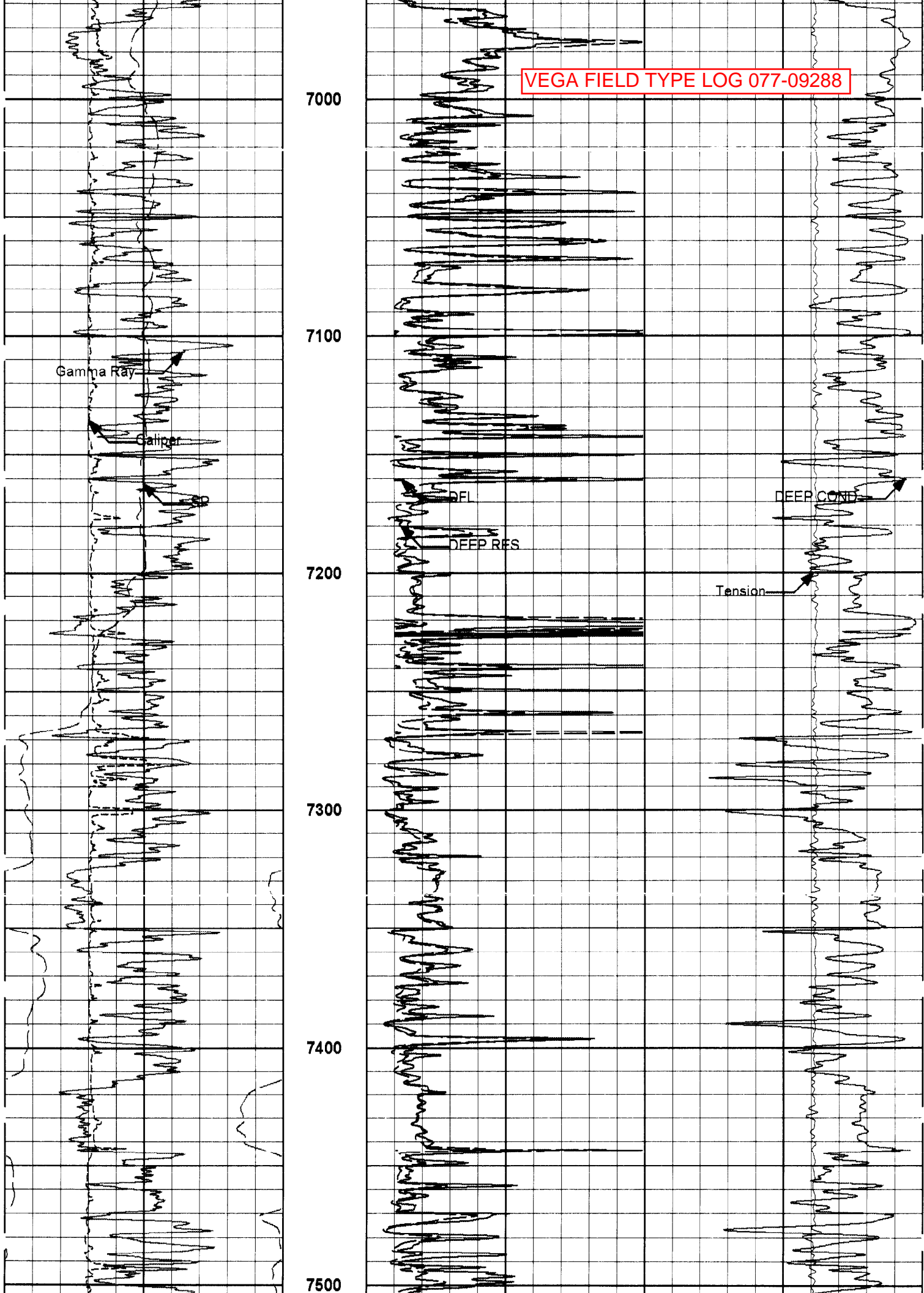
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Gamma Ray

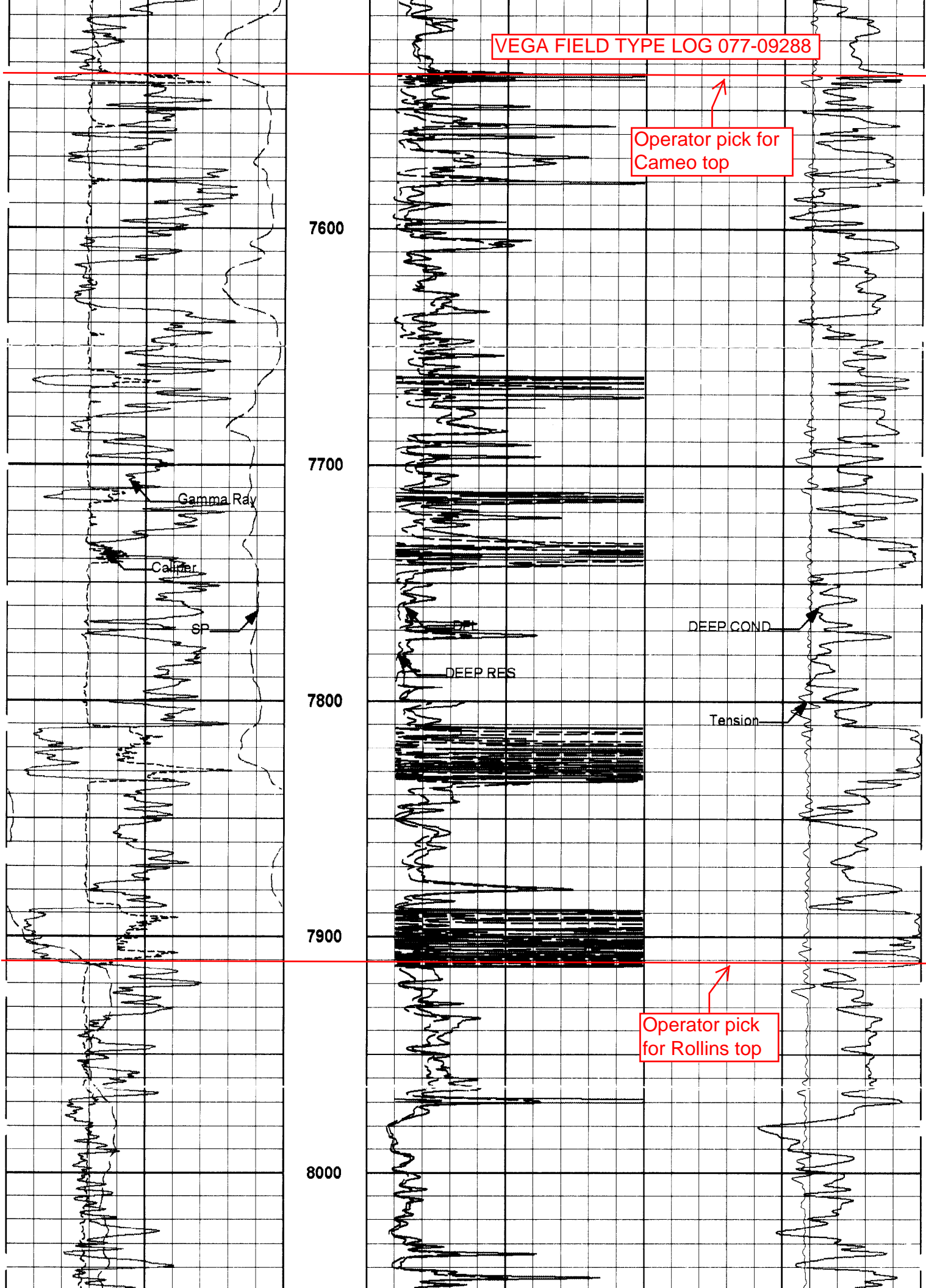
Caliper

DFI

DEEP RES

Tension

DEEP COMB



Operator pick for Cameo top

Gamma Ray

Caliper

SP

DEEP RES

DEEP COND

Tension

7600

7700

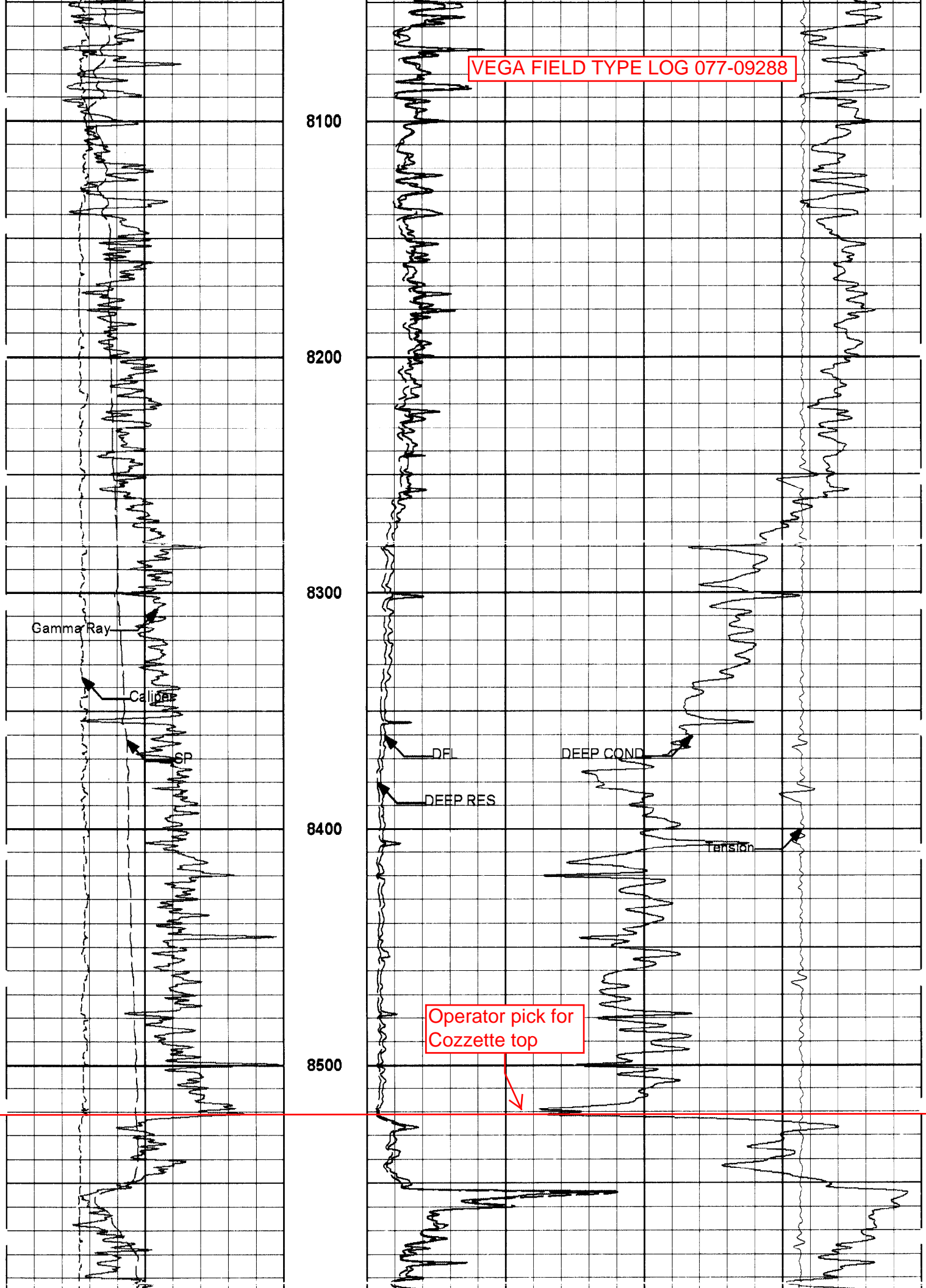
7800

7900

8000

Operator pick for Rollins top

VEGA FIELD TYPE LOG 077-09288



Gamma Ray

Caliper

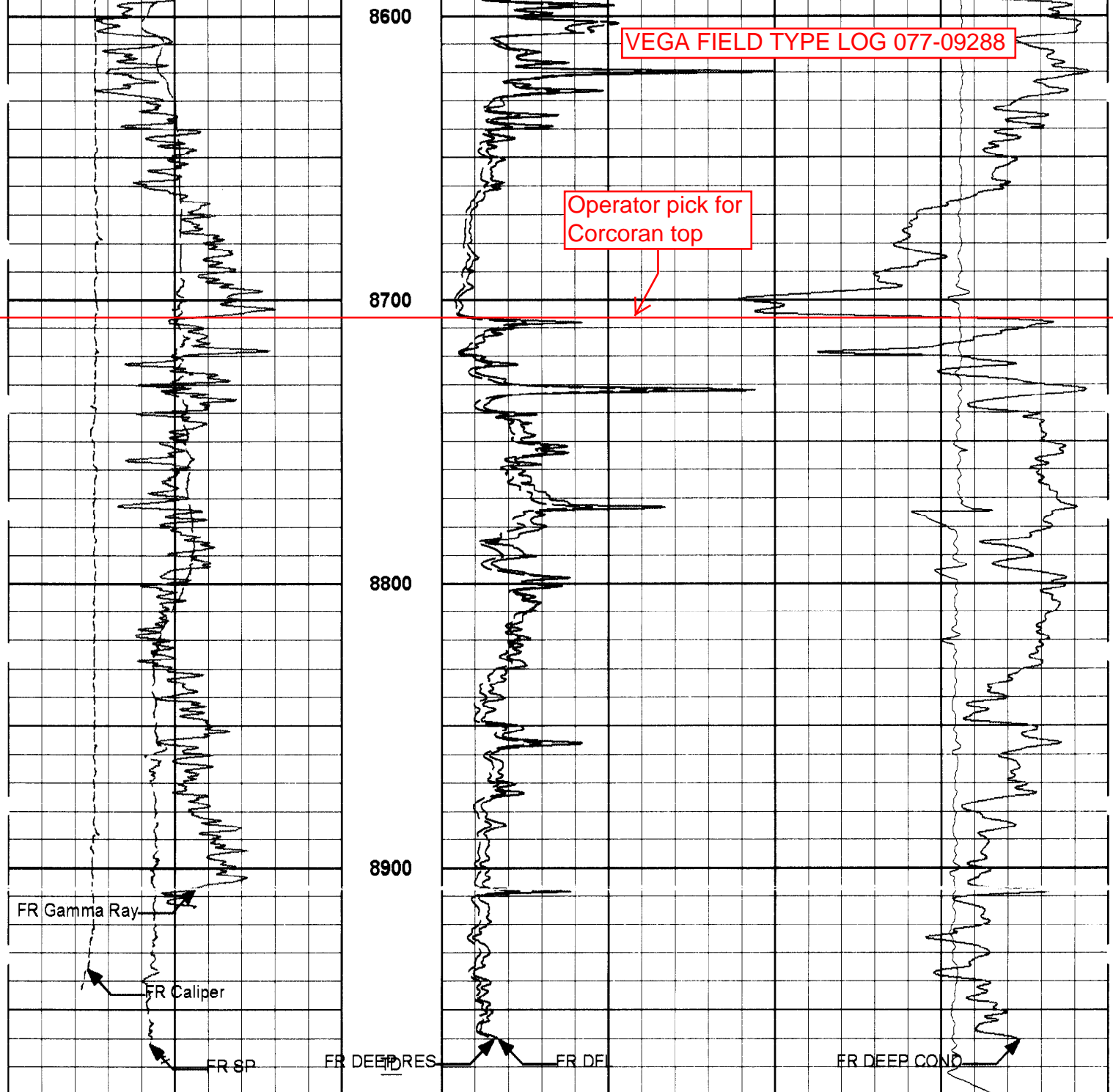
DFL

DEEP RES

DEEP COND

Tension

Operator pick for  
Cozzette top



FR Gamma Ray

FR Caliper

FR SP

FR DEEP RES

FR DFL

FR DEEP COND

SP	MD	0	DEEP RES	100		
- 10mV +	1 : 600		ohmm			
6	ft	0	DFL	100	10000	Tension
Caliper			ohmm			lbs
16						
inches		500			DEEP COND	0
Gamma Ray						
200						
api					mmo/m	

**HALLIBURTON**

Plot Time: 04-Aug-07 21:41:01  
 Plot Range: 2020 ft to 8980 ft  
 Data: {ActiveWell}-Well Based-DAQ-0002-MAIN-  
 Plot File: \\ND\DELTA\_2IN\_IND\_COND

INDUCTION - CONDUCTIVITY PRESENTATION  
 MAIN LOG SECTION  
 2" = 100'