

HA...L...RTON

HIGH RESOLUTION
INDUCTION

045-13191

PARACHUTE FIELD TYPE LOG 045-13191

COGCC Document Number 2056084

05-02-2016

COMPANY NOBLE ENERGY INC.	WELL M. DUTTON #1-34B	FIELD PARACHUTE FIELD	COUNTY GARFIELD	STATE CO
GROUND LEVEL KELLY BUSHING KELLY BUSHING	Typ. 08S	Rge. 96W	Elev. 6075.0 ft	Elev. K.B. D.F. G.L.
API No. 050451319100	Location: 0987 FSL 1289 FEL - BOTTOM: 0670 FSL 1979 FEL	Other Services: SDL / DSN BCS		
Date 11-Mar-08 00:45	Ln No. ONE	Depth - Driller 6800.0 ft	Depth - Logger 6776.0 ft	Atom - Logged Interval 6766.0 ft
App - Logged Interval 1546.0 ft	Logging - Driller 9.675 in @ 1546.0 ft	Logging - Logger 1546.0 ft	Log Size 7.875 in	Type Fluid in Hole LSND
Density 8.8 ppv	Viscosity 74.00 scf	Ph 10.10 pH	Fluid Loss 4.6 qplm	Source of Sample MUD TANK
Rm @ Meas. Temperature 1.55 ohmm @ 67.00 degF	Rmf @ Meas. Temperature 1.45 ohmm @ 70.30 degF	Rmc @ Meas. Temperature 1.42 ohmm @ 78.00 degF	Source Rmf Rmc MEAS. MEAS.	m @ BHT 0.60 ohmm @ 183.00 degF
Time Since Circulation 9.3 hr	Time on Bottom 11-Mar-08 04:15	Max Rec. Temperature 183.0 degF @ 6776.0 ft	Equipment Location 10748912 G.J.	Recorded By M. MAZUREK
Assessed By J. HOWELL				E KIND

RECEIVED
APR 08 2008
COGCC

Fold here

Service Ticket No.: 5738084		API Serial No.: 050451319100		PGM Version: WL INSITE R2.0 (Build 22)					
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	1.55 ohmm @ 67.00 degF	@	Run No.	Tool Type & No.	Pad Type	Tool Pos.	Other		
Rmf @ Meas. Temp.	1.45 ohmm @ 70.30 degF	@	ONE	HRI-191S0180	N/A	CENTERED	N/A		
Rmc @ Meas. Temp.	1.42 ohmm @ 78.00 degF	@							
Source Rmf	Rmc	CALC.	CALC.						
Rm @ BHT	0.60 ohmm @ 183.00 degF	@							
Rmf @ BHT	0.59 ohmm @ 183.00 degF	@							
Rmc @ BHT	0.63 ohmm @ 183.00 degF	@							
EQUIPMENT DATA									
GAMMA		ACOUSTIC		DENSITY		NEUTRON			
Run No.	ONE	Run No.	ONE	Run No.	ONE	Run No.	ONE		
Serial No.	A143_2	Serial No.	B064-13075	Serial No.	I709MC136_2	Serial No.	A064_2		
Model No.	NGRT	Model No.	M305B-BCS	Model No.	SDL-DC	Model No.	DSN-II		
Diameter	3.625"	No. of Cent.	4	Diameter	4.50"	Diameter	3.625"		
Detector Model No.	102A	Spacing	3' - 5'	Log Type	GAMMA-GAMMA	Log Type	THERMAL		
Type	SCINT.			Source Type	Cs137	Source Type	Am241Be		
Length	4"	LSA [Y/N]	N	Serial No.	3026 GW	Serial No.	DSN-108		
Distance to Source	11'	FWDA [Y/N]	N	Strength	1.5 Ci	Strength	18.5 Ci		
LOGGING DATA									
GENERAL		GAMMA		ACOUSTIC		DENSITY		NEUTRON	

Run No.	Depth		Speed ft/min	Scale		Scale		Matrix	Scale		Matrix	Scale		Matrix
	From	To		L	R	L	R		L	R		L	R	
ONE	T.D.	CSG	REC.	0	200	30%	-10%	55.5	30%	-10%	2.68	30%	-10%	SAND

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DIRECTIONAL INFORMATION

Maximum Deviation

⊙

KOP

⊙

Remarks:

~~RWCH D4TS-NGRT-DSN-SDL-BCS-HRID WERF RAN IN COMBINATION~~

HOLE RUGOSITY AND TENSION PULLS MAY AFFECT LOG QUALITY.

A.H.V. CALCULATED FOR 7.0" CASING.

CHLORIDES REPORTED AT 900 mg/L.

LATITUDE: 39.38° N // LONGITUDE: 108.05° W

YOUR CREW TODAY IS J. NEFF AND N. EHLERS.

RIG: PATTERSON #154

THANK YOU FOR CHOOSING HALLIBURTON ENERGY SERVICES - GRAND JUNCTION, CO - (970) 523-3600.

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	8.800	ppg
	SHARED	RMUD	Mud Resistivity	2.000	ohmm
	SHARED	TRM	Temperature of Mud	75.0	degF
	SHARED	OBM	Oil Based Mud System?	No	
	SHARED	CSD	Logging Interval is Cased?	No	
	SHARED	ICOD	AHV Casing OD	7.000	in
	SHARED	ST	Surface Temperature	75.0	degF
	SHARED	TD	Total Well Depth	6776.00	ft
	SHARED	BHT	Bottom Hole Temperature	183.0	degF
	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 / CrossPlot	RMFR	Rmf Reference	0.10	ohmm
	Rwa / CrossPlot	TMFR	Rmf Ref Temp	75.00	degF
	Rwa / CrossPlot	RWA	Resistivity of Formation Water	0.05	ohmm
	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	NLIT	Neutron Lithology	Sandstone	
DSN_II	DNSO	DSNTool Standoff	0.000	in
DSN_II	DNTP	Temperature Correction Type	None	
DSN_II	DPRS	DSN Pressure Correction Type	None	
DSN_II	SHCO	View More Correction Options	No	
DSN_II	UTVD	Use TVD for Gradient Corrections?	No	
DSN_II		Logging Horizontal Water Tank?	No	
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	MOTP	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	
BCS	BCOK	Compute BCS Results?	Yes	
BCS	DTFL	Delta -T Fluid	189.00	uspf
BCS	DTMT	Delta -T Matrix Type	Sandstone 55.5	
BCS	DTSH	Delta -T Shale	100.00	uspf
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	1525.0	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: NOB_M_DUT_1_34B\0002 QUAD COMBOIDLE

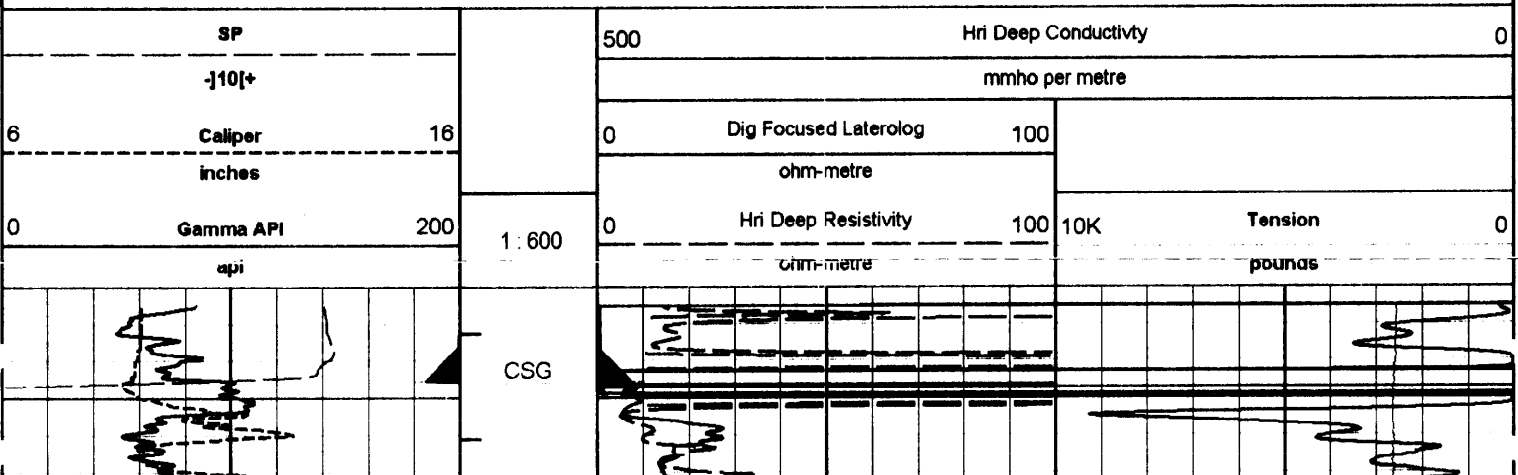
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HALLIBURTON Plot Time: 11-Mar-08 09:19:20
 Plot Range: 1520 ft to 6790 ft
 Data: NOB_M_DUT_1_34B\Well Based\MAIN PASS - CASING\
 Plot File: \HRIDITS_HRI_2IN_RM

MAIN PASS 2" = 100'

Wasatch Formation at Surface



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1600

COGCC pick for
Wasatch G Sand top
(upper interval)

1700

COGCC pick for
Wasatch G Sand top
(lower interval)

1800

1900

2000

2100

Garriga API

Dig Focused Laterolog

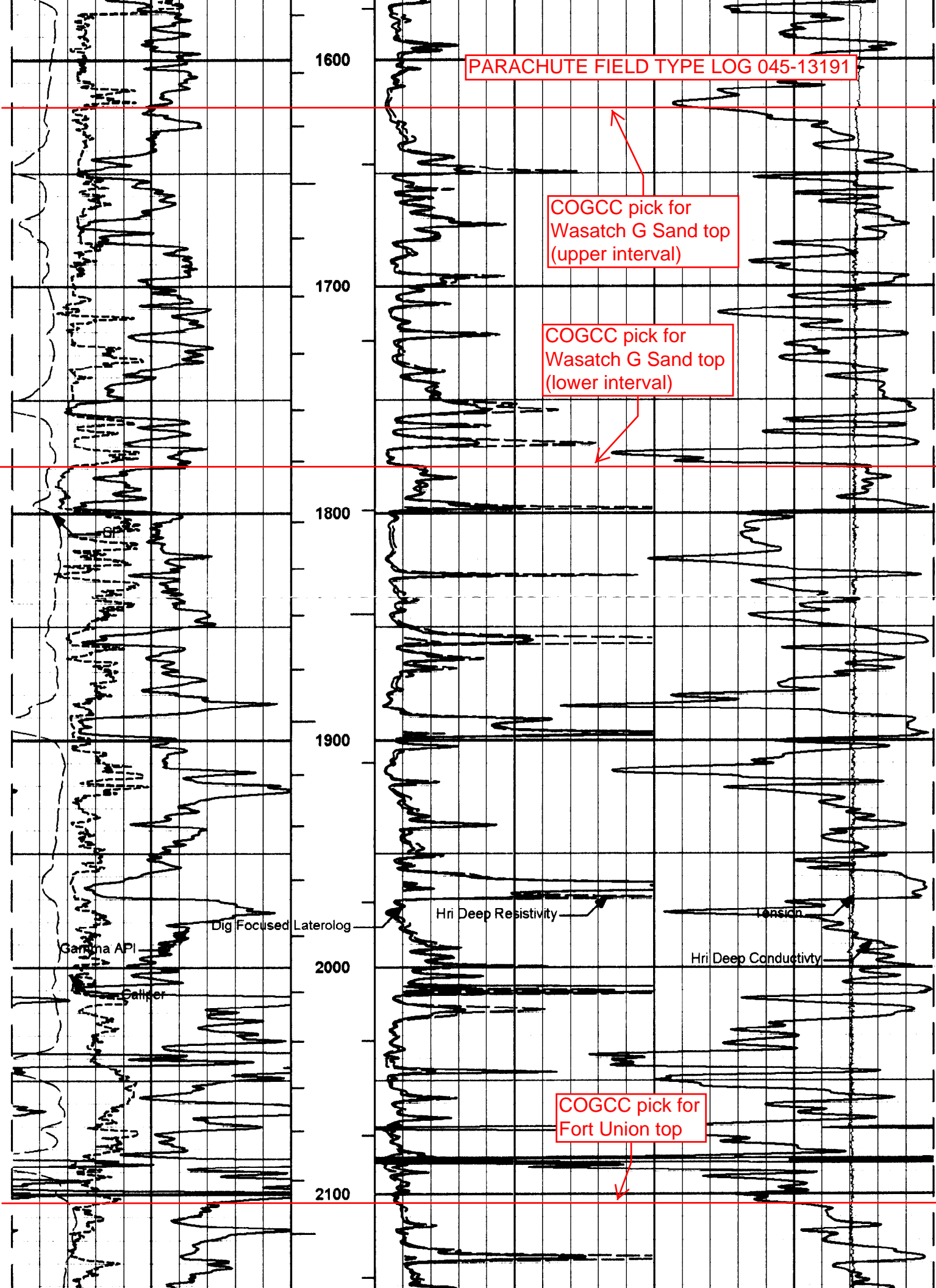
Hri Deep Resistivity

Gamma

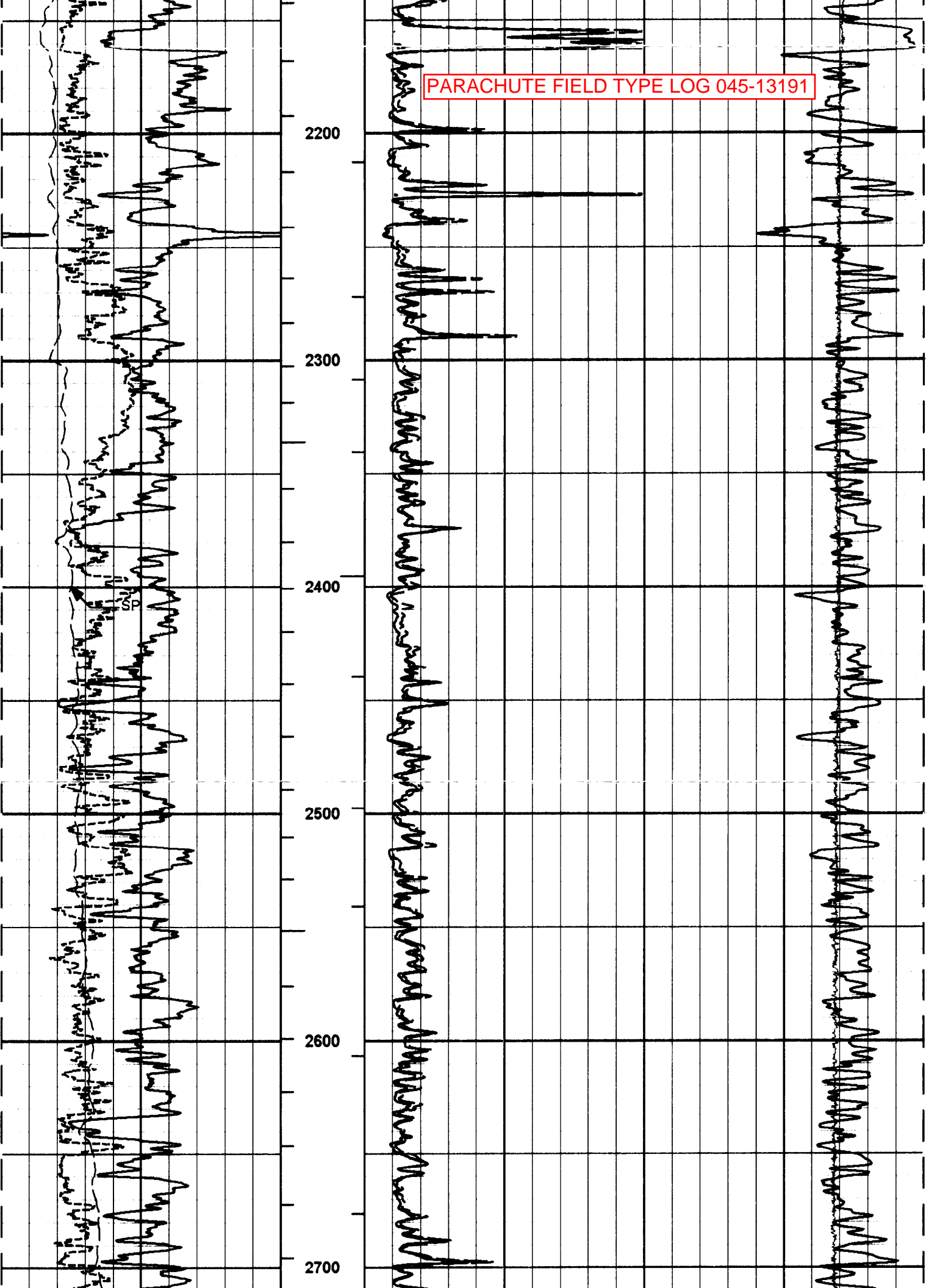
Hri Deep Conductivity

Caliper

COGCC pick for
Fort Union top



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2800

COGCC pick for Lower Wasatch top (cement required 200' above this point, effective 05/02/2016)

2900

COGCC pick for Ohio Creek top

Hri Deep Resistivity

Tension

Gamma Ray Dig Focused Laterolog

Hri Deep Conductivity

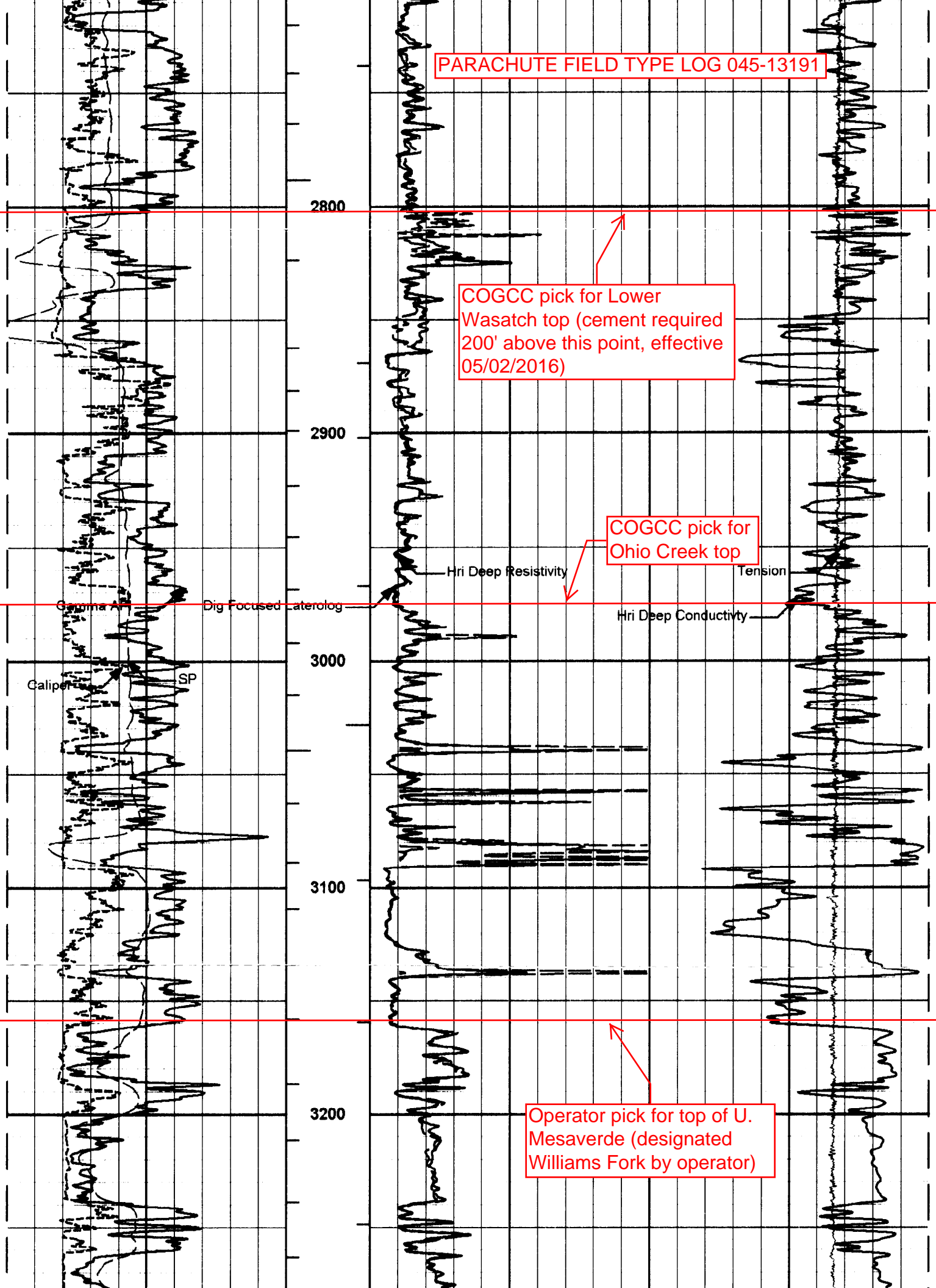
3000

Caliper SP

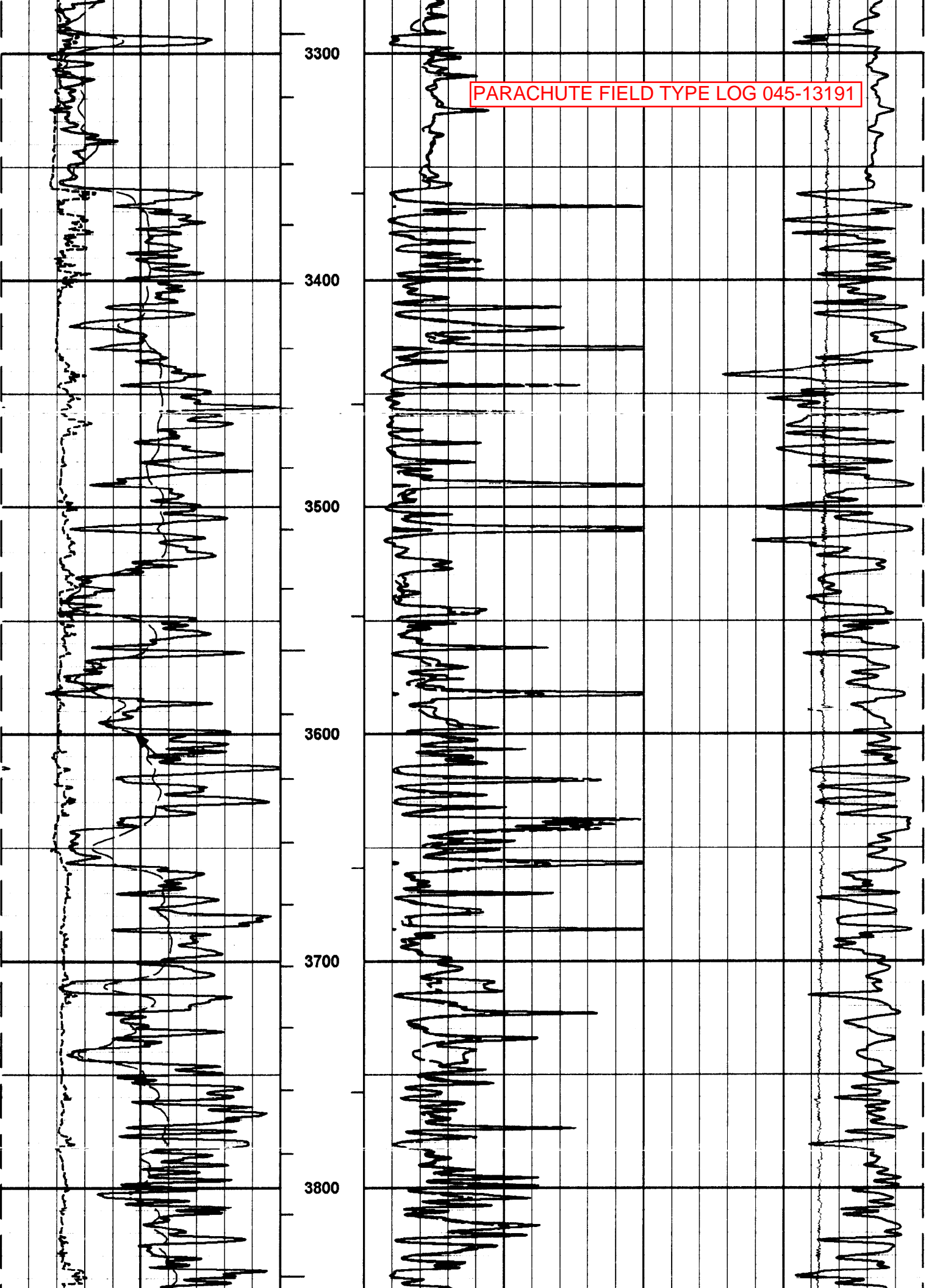
3100

3200

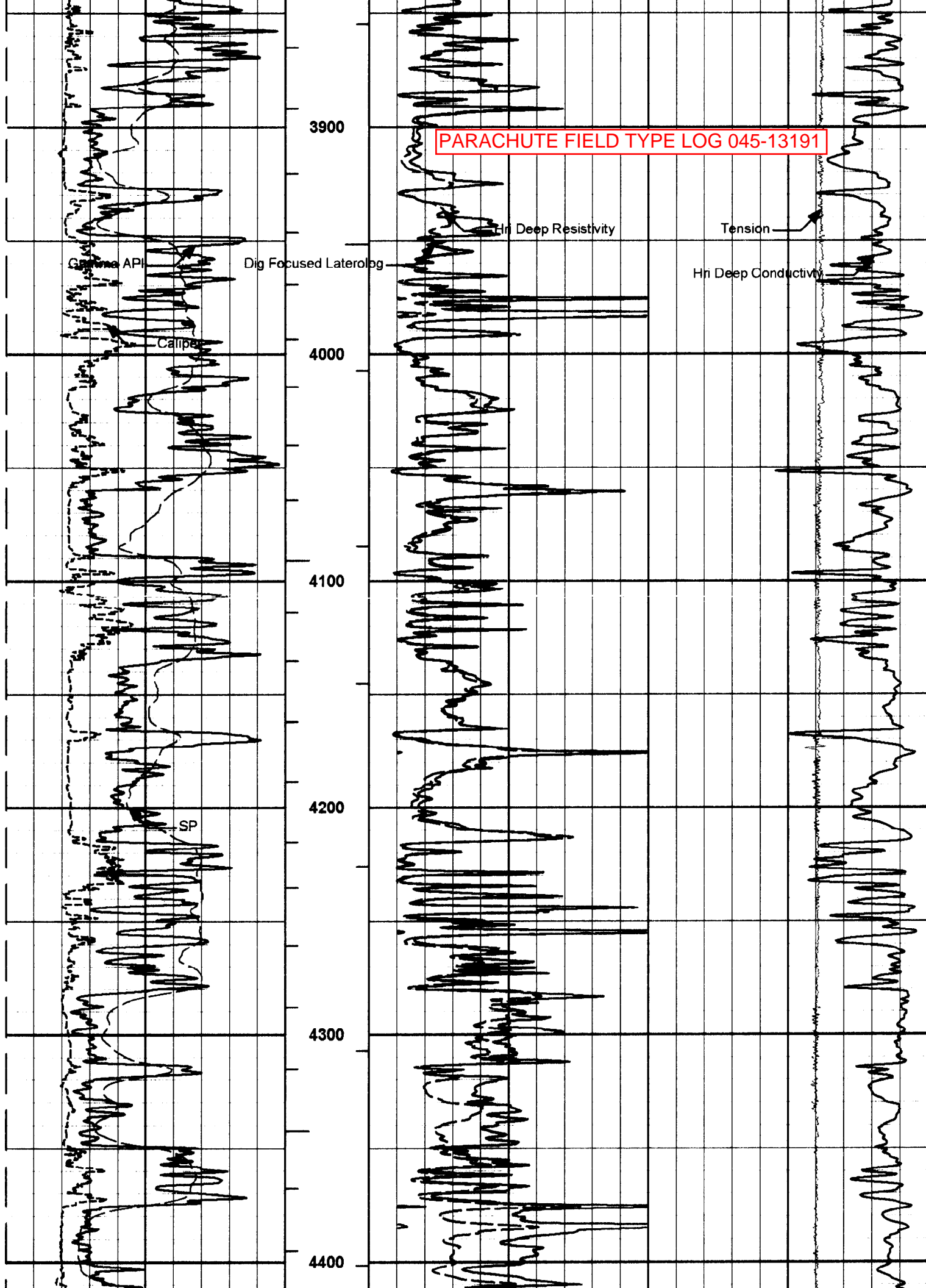
Operator pick for top of U. Mesaverde (designated Williams Fork by operator)



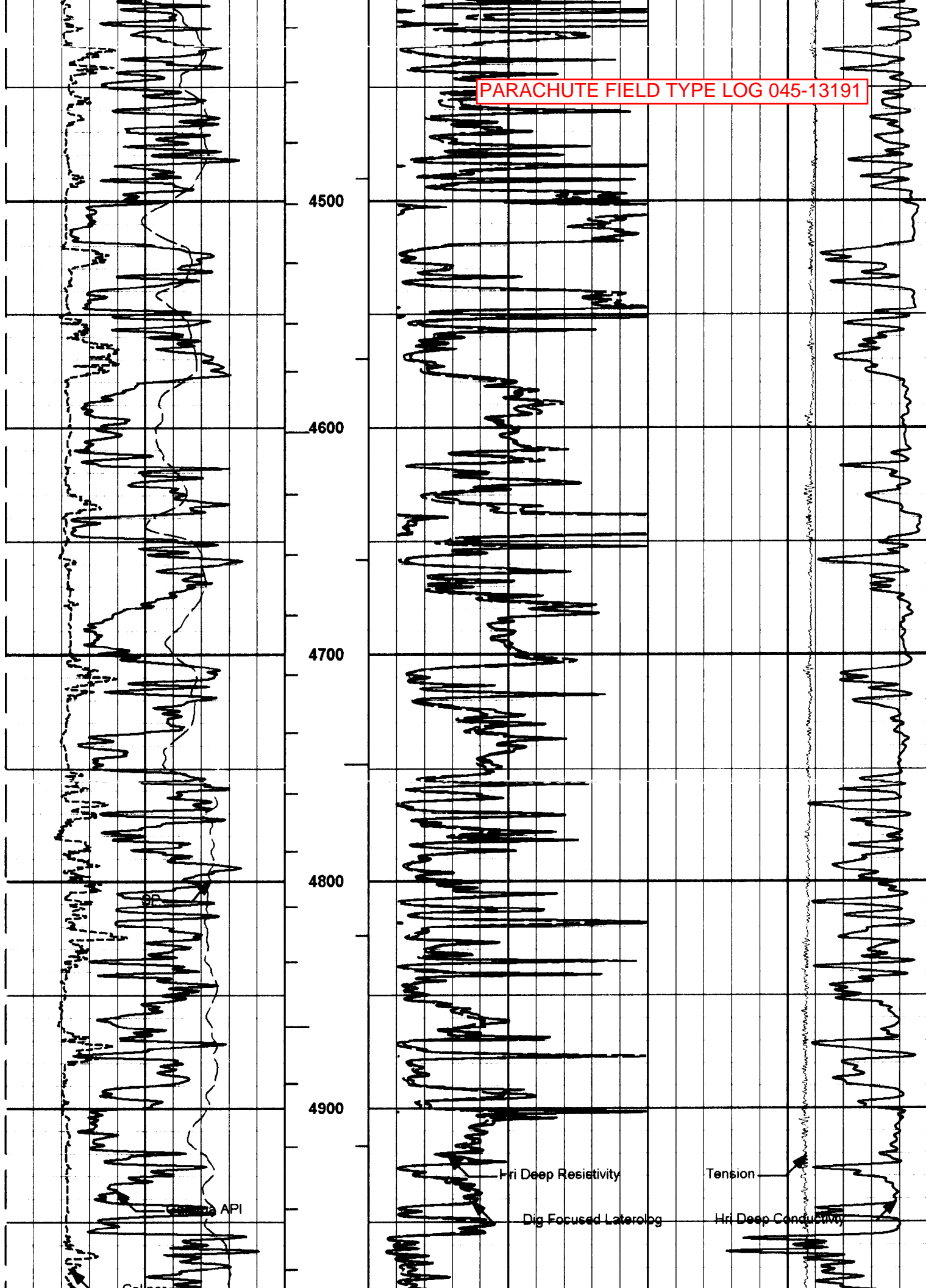
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4500

4600

4700

4800

4900

Hri Deep Resistivity

Tension

Dig Focused Laterolog

Hri Deep Conductivity

API

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5000

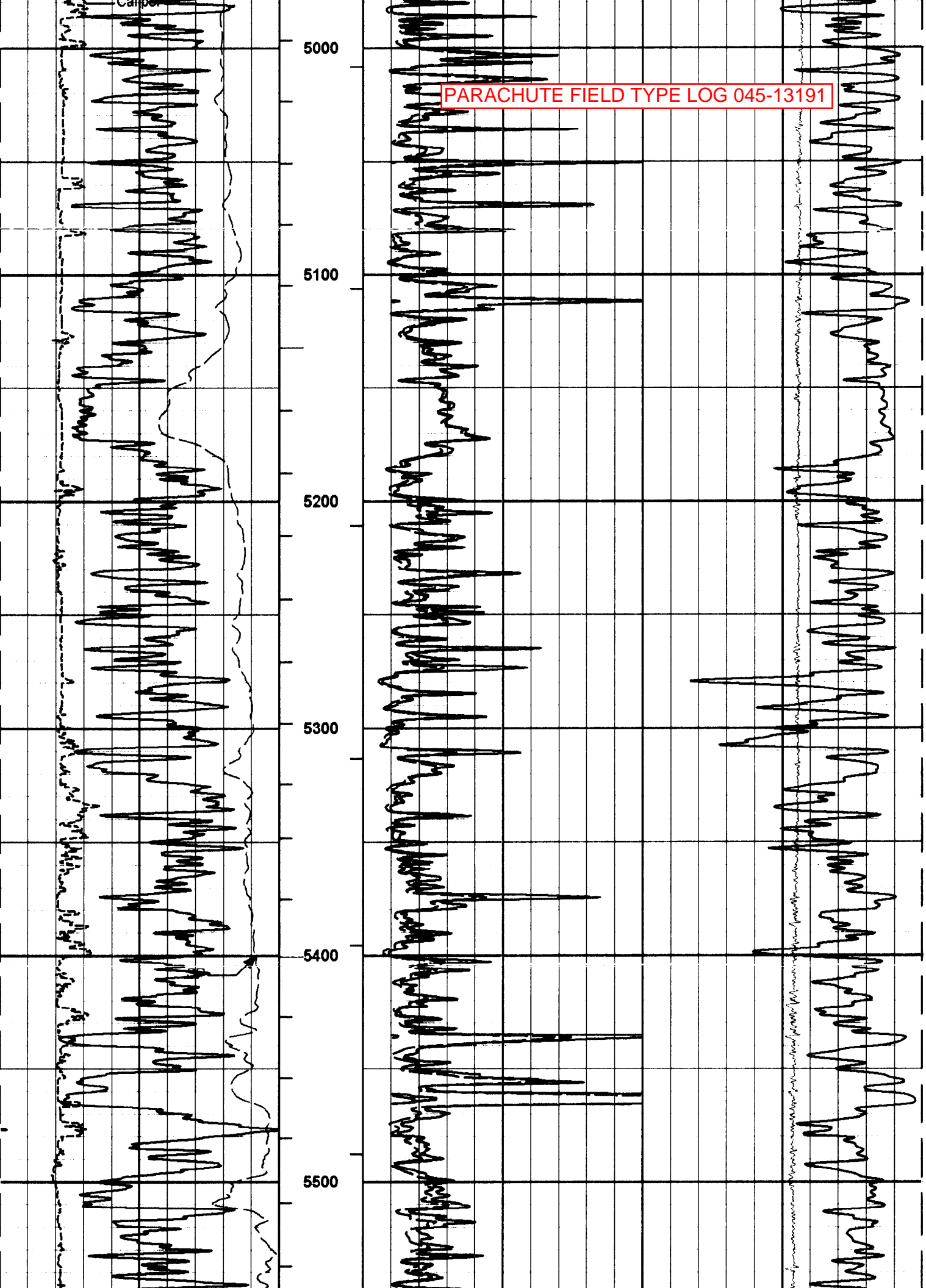
5100

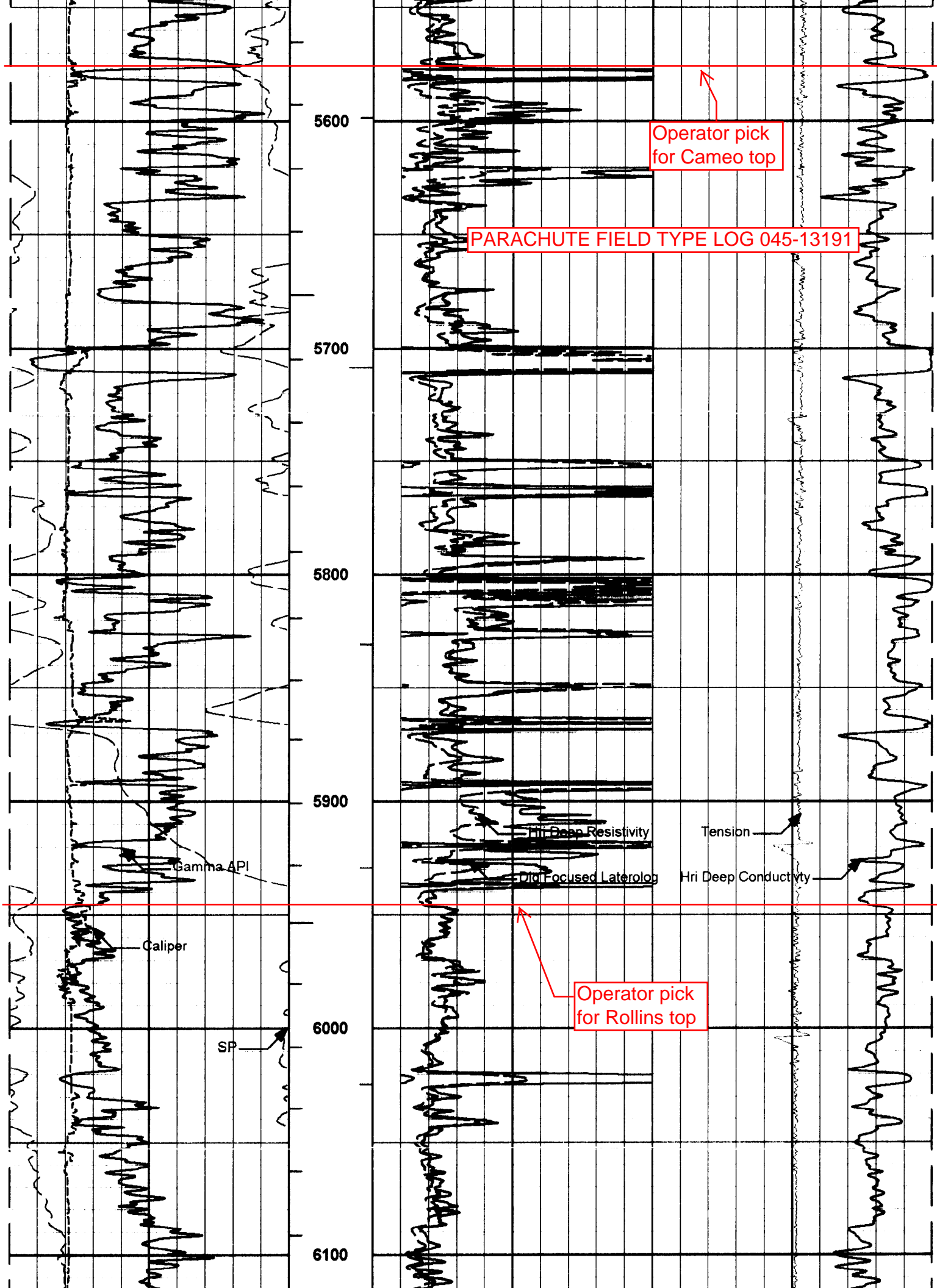
5200

5300

5400

5500





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6200

Operator pick for
Cozzette top

6300

Operator pick for
Corcoran top

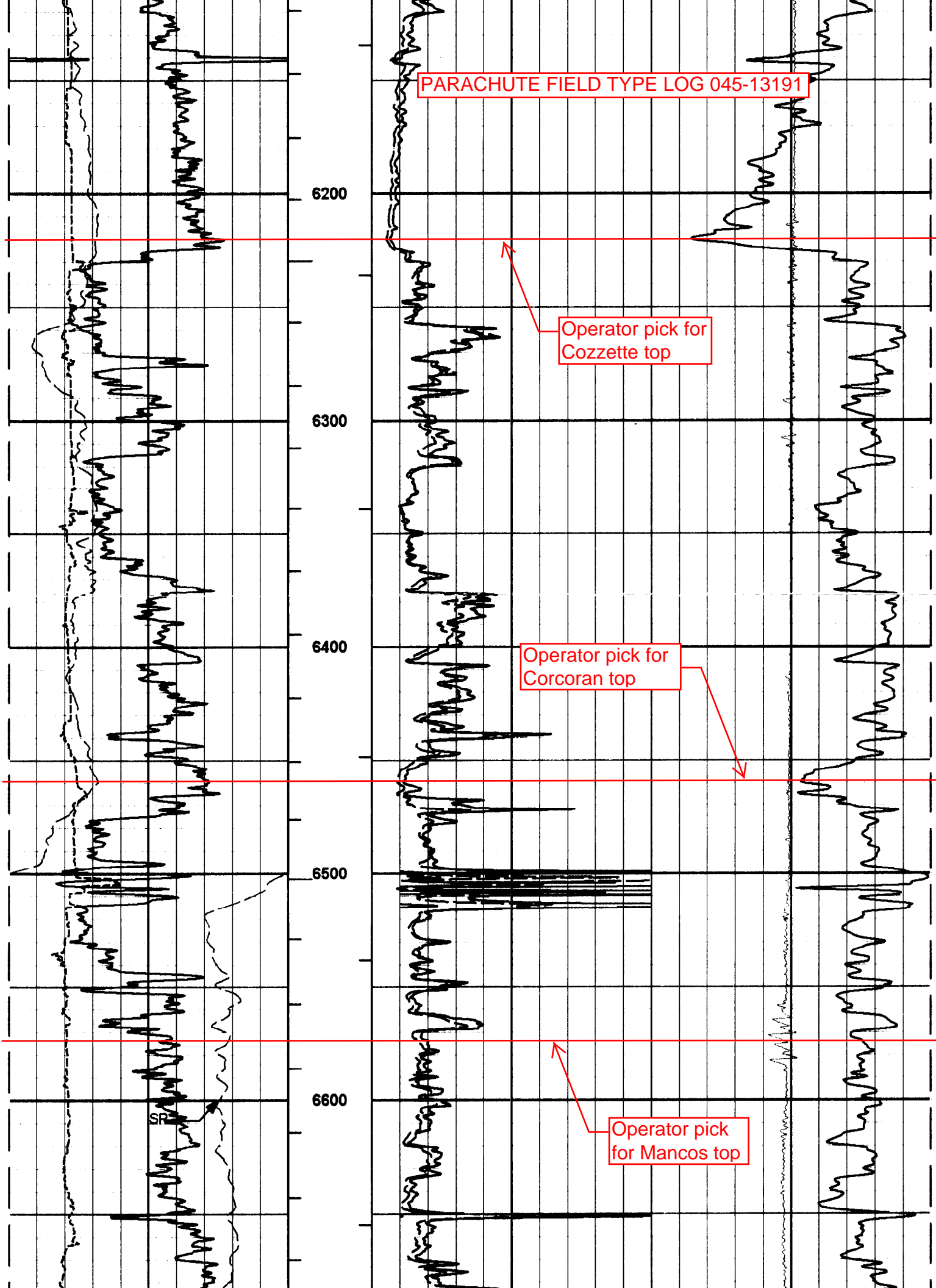
6400

6500

Operator pick for
Mancos top

6600

SR



6700

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TD

0	Gamma API	200	1 : 600	0	Hri Deep Resistivity	100	10K	Tension	0	
	api					ohm-metre			pounds	
6	Caliper	16		0	Dig Focused Laterolog	100				
	inches					ohm-metre				
	SP				500	Hri Deep Conductivity				0
	-j10[+				mmho per metre					

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