



**Multiple Propagation Resistivity  
Gamma Ray**

**LWD MEMORY LOG**

Scale:	<b>1:1200 MD</b>	Company:	<b>Verdad Oil &amp; Gas Corporation</b>
Depth Reference:	<b>Driller's Depth</b>	Well:	<b>Lost Creek 03-62-08-2H</b>
		Field:	<b>Weld County (NAD83/TN)</b>
		Country:	<b>Weld</b>
		State:	<b>Colorado</b>
		Country:	<b>United States</b>

Status:	<b>Final Print</b>	Surface Location:	Other Services:
API No:	05-123-44648	Latitude:	040° 14' 48.876" N
Job ID:	8559926	Longitude:	104° 21' 09.173" W
		SEC:	8 TWN: 3N RGE: 62W
Permanent Datum (P.D.):	Ground Level	Elevation:	4697.00 ft
Log Measured From:	Rig Floor	Above P.D.	16.00 ft
		Elev. KB:	4713.00 ft
		Elev. DF:	4697.00 ft
		Elev. GL:	

Dates	Interval Logged	Magnetic Field Reference	
Date From:	2017-05-16	Top: (ft)	1690.00
Date To:	2017-06-17	Bottom: (ft)	5850.00
Spud Date:	2017-05-16	Total Magnetic Field Strength: (nT)	52431
		Mag to Reference North Correction: (deg)	8.14 E

Borehole Record				Casing Record			
Hole Size (in)	From (ft)	To (ft)	Size (in)	Weight (lb/ft)	From (ft)	To (ft)	
13.500	0.00	1720.00	9.625	36.00	0.00	1720.00	
8.500	1720.00	13989.00					

Mud Record				Deviation Record			
Type	From (ft)	To (ft)	Hole Size (in)	Interval (ft)	Incl   Az (Start)	Incl   Az (End)	
Diesel-Oil Based Mud	1720.00	13989.00	13.500	1720.00	0.001	0.00	
			8.500	12269.00	0.251	61.95	

Acquisition System	Software Version	Other
Baker Hughes Cadence	RT4.1	Rig: Xtreme 20
Plot Studio	4.1.7763.3	Contractor: Xtreme Drilling
		District: RMA
		Unit: D&E

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**Log Run Summary**

Run	Bit	Bit	Bit	Bit	Assembly	Logged Interval	Bit Depth Interval	Date / Time	Circ.
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No	Run No.	Size (in)	Type	Gauge Length (in)	Type	Top (ft)	Bottom (ft)	From (ft)	To (ft)	Start Logging	End Logging	Hours (h)
2	2	8.500	PDC	3.00	AutoTrak Curve	1720.00	2590.00	1720.00	2603.00	2017-06-14 09:28	2017-06-14 17:26	7.28
3	3	8.500	PDC	3.00	AutoTrak Curve	2590.00	5768.00	2603.00	13989.00	2017-06-14 23:28	2017-06-17 09:09	51.80
<b>Crew</b>												
Name			Arrive Wellsite	Depart Wellsite	Name		Arrive Wellsite	Depart Wellsite	Name		Arrive Wellsite	Depart Wellsite
Garrett Gerdson			2017-06-12	2017-06-18	John Bryson		2017-06-12	2017-06-18				
<b>Mud Properties Record</b>												
Date / Time		Run No.	Measured Depth (ft)	Mud Type	Density (ppg)	Viscosity (cP)	pH	Fluid Loss (cm3)	Oil / Water	Source	Total Chlorides (ppm)	K+ (%)
2017-06-14 05:00		2	1720.00	Diesel-Oil Based Mud	9.3	21	N/A	7.0	76/24	Active Pit	16000	0.00
2017-06-14 17:00		2	2603.00	Diesel-Oil Based Mud	9.3	22	N/A	8.0	75/25	Active Pit	35000	0.00
2017-06-15 05:00		3	3937.00	Diesel-Oil Based Mud	9.2	19	N/A	8.0	75/25	Active Pit	36000	0.00
2017-06-16 05:00		3	8333.00	Diesel-Oil Based Mud	10.0	23	N/A	8.0	71/29	Active Pit	40000	0.00
2017-06-17 05:00		3	13082.00	Diesel-Oil Based Mud	10.2	21	N/A	8.0	65.5/34.5	Active Pit	38000	0.00
<b>Mud Resistivity Record</b>												
				Surface						Downhole		
Date / Time		Run No.	Measured Depth (ft)	Surface Temp (degF)	Rm (ohm.m)	Rmf (ohm.m)	Rmc (ohm.m)	BHCT (degF)	Rm @ BHCT (ohm.m)	Rmf @ BHCT (ohm.m)	Rmc @ BHCT (ohm.m)	
2017-06-17 18:08		3	13989.41	80.0	100.000	N/A	N/A	215.0	100.000	N/A	N/A	
<b>Equipment and Service Data</b>												
Run No.	Tool			Serial Number	Measurement		Sensor Offset (ft)	Bit Offset (ft)	Max O.D. (in)	Min I.D. (in)		
2	ATC_SU			14236902	Near Bit Inclination		5.93	6.71	7.000	4.330		
2	ATC_SU			14236902	Near Bit VSS		5.93	6.71	7.000	4.330		
2	ATC_MWD			12154241	Gamma (single)		2.74	12.88	7.000	3.250		
2	ATC_MWD			12154241	Directional (mag)		12.26	22.40	7.000	3.250		
3	OnTrak			12115658	Pressure		1.06	8216.21	6.750	0.000		
3	OnTrak			12115658	Gamma (double)		1.95	8217.10	6.750	0.000		
3	OnTrak			12115658	Resistivity (4tx)		5.99	8221.14	6.750	0.000		
3	OnTrak			12115658	Directional (mag)		11.78	8226.93	6.750	0.000		
<b>Service and Tool Mnemonics</b>												
Mnemonic	Name			Description								
ATC_SU	ATC_SU			Auto Trak Curve Steering Unit								
ATC_MWD	ATC_MWD			Auto Trak Curve MWD								
ATC_LCPM	ATC_LCPM			Auto Trak Curve LCPM								
OTK	OnTrak			Sensor Sub (Inc, Azi, Temp, Azimuthal GR, Res, AP, VSS), OnTrak Platform								
BCPM	BCPM			Bi-Directional Communication and Power Module, OnTrak Platform								

**Comments**

- 1 Depth measurements obtained from a depth control system not supplied or operated by Baker Hughes. Due to lack of control by Baker Hughes logging engineers, depth calibrations and measurements could not be independently verified.
- 2 Baker Hughes LWD Runs 2 and 3 utilized 6 3/4 inch OnTrak services (Multiple Propagation Resistivity, Gamma Ray, and Directional) behind an 8 1/2 inch bit and rotary steerable assembly to perform a MAD (Measurement After Drilling) Pass from 1720 to 5768 feet MD (1720 to 5662 feet TVD ). The data collected during this run was ream logged up to 24 hours after being drilled and it is presented independent of the drilling log.

**Remarks**

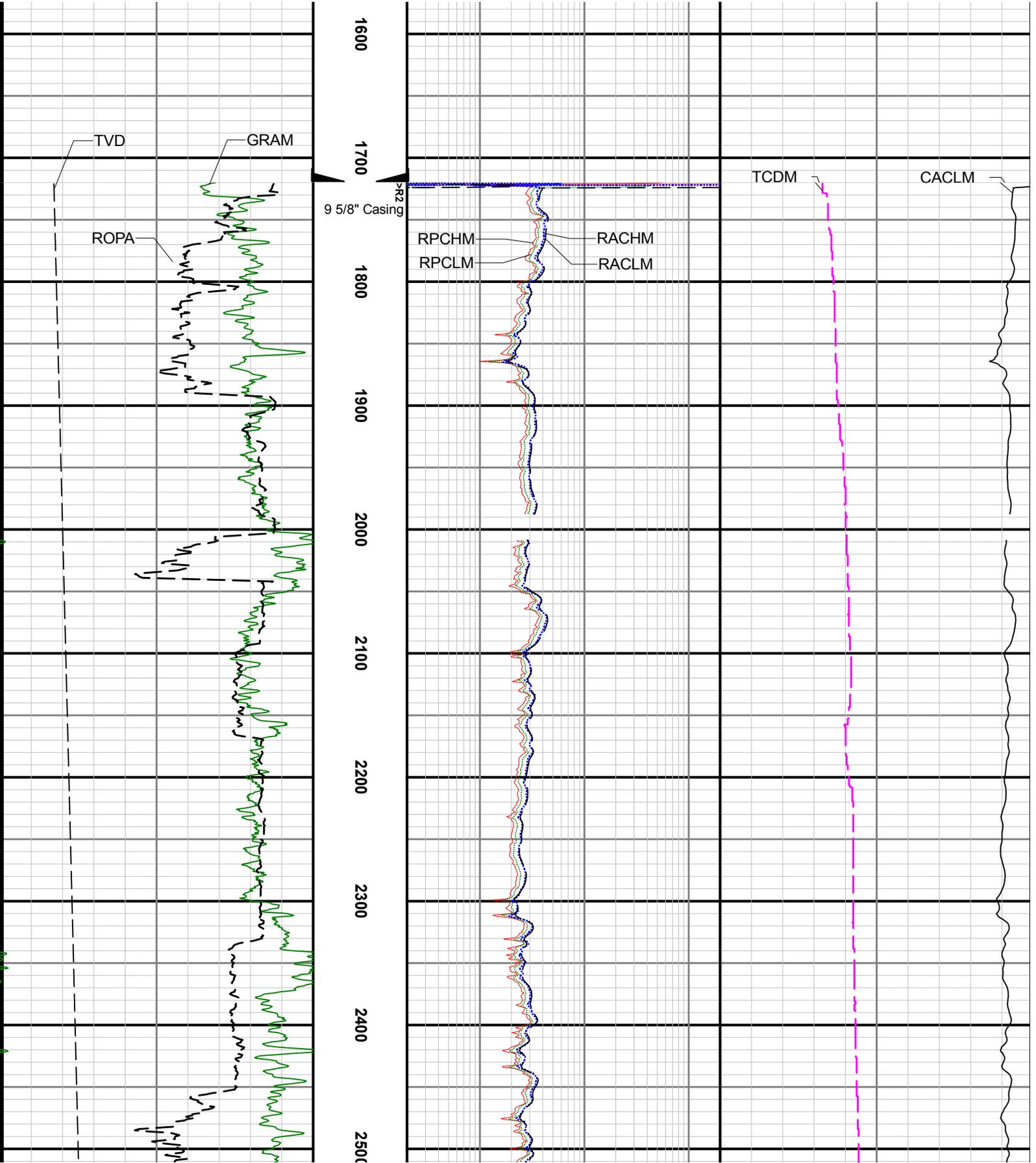
Number	Measured Depth (ft)	Hole Section (in)	Run No.	Remark
1	5780.00	8.500	3	The interval from 5768 to 13989 feet MD (5662 to 6349 feet TVD) was not logged with OnTrak services due to sensor to bit offset at well TD.

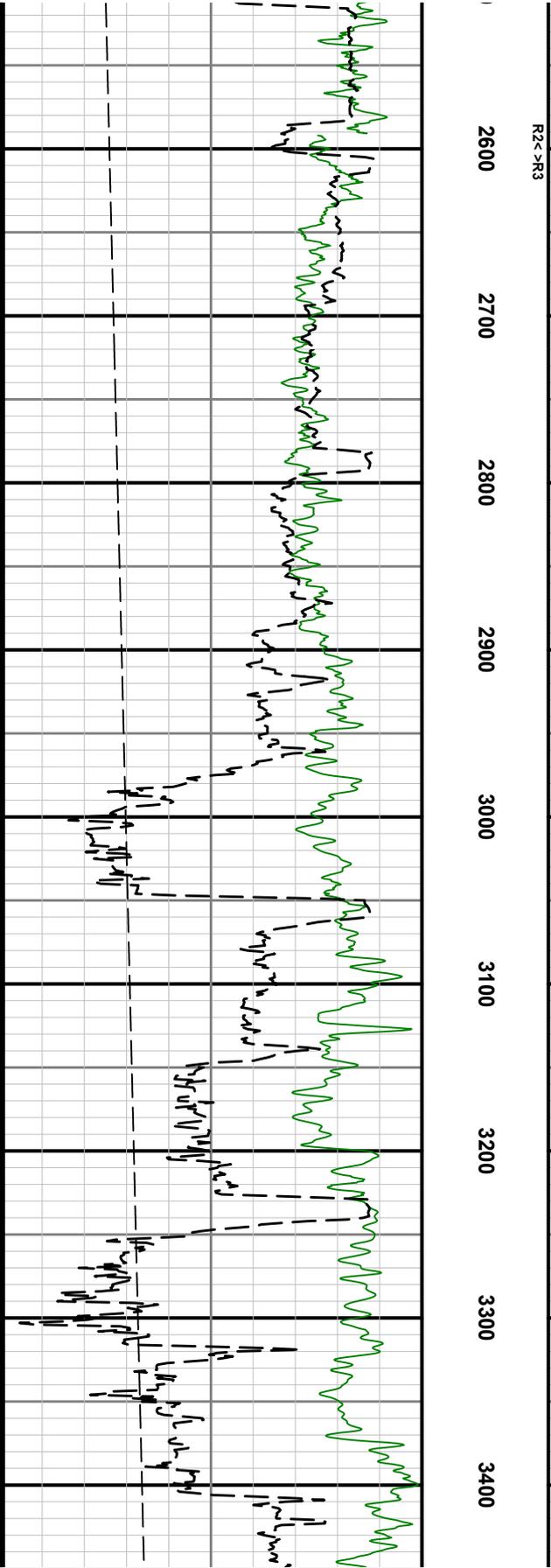
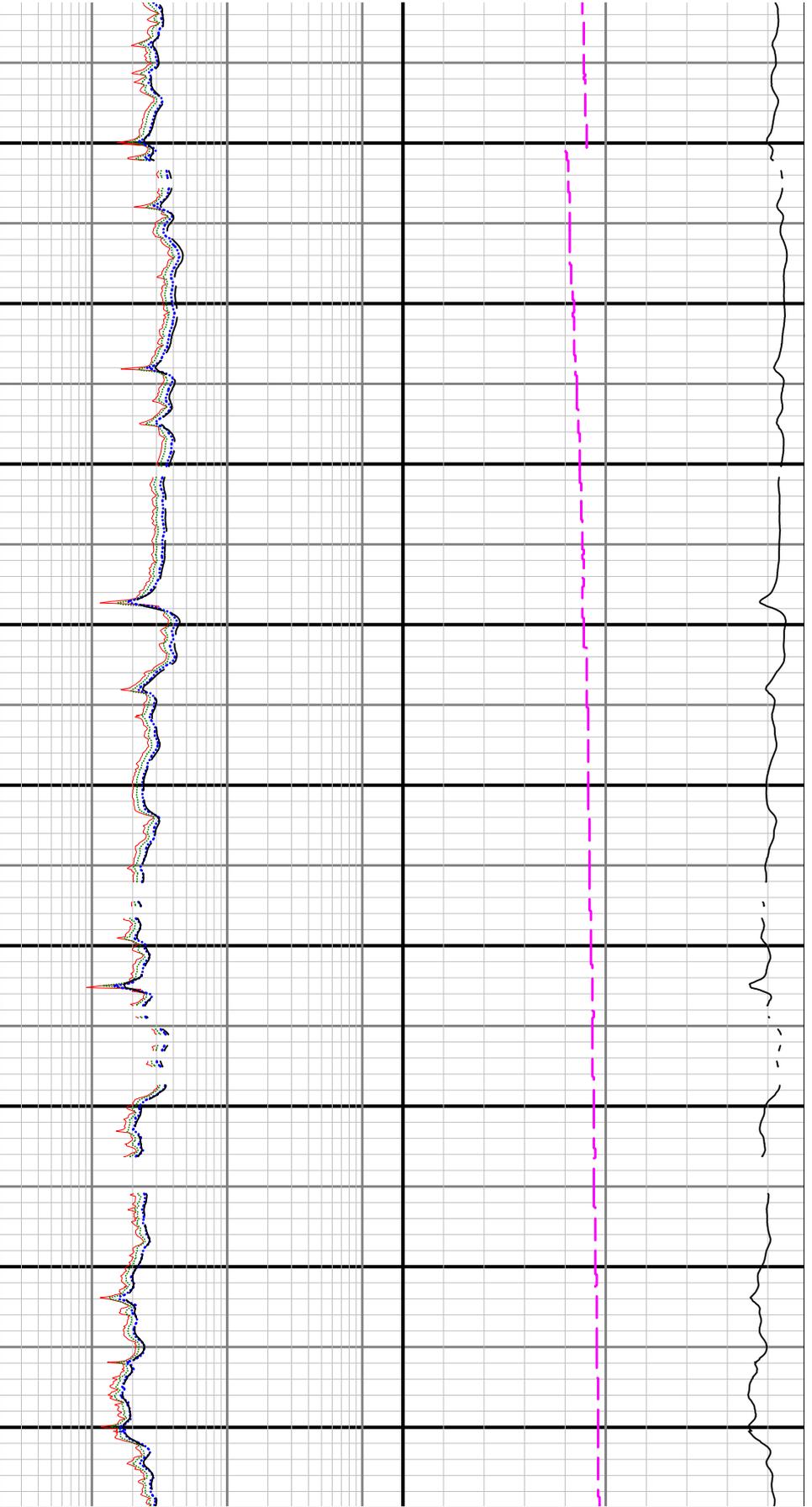
**Curve Mnemonics**

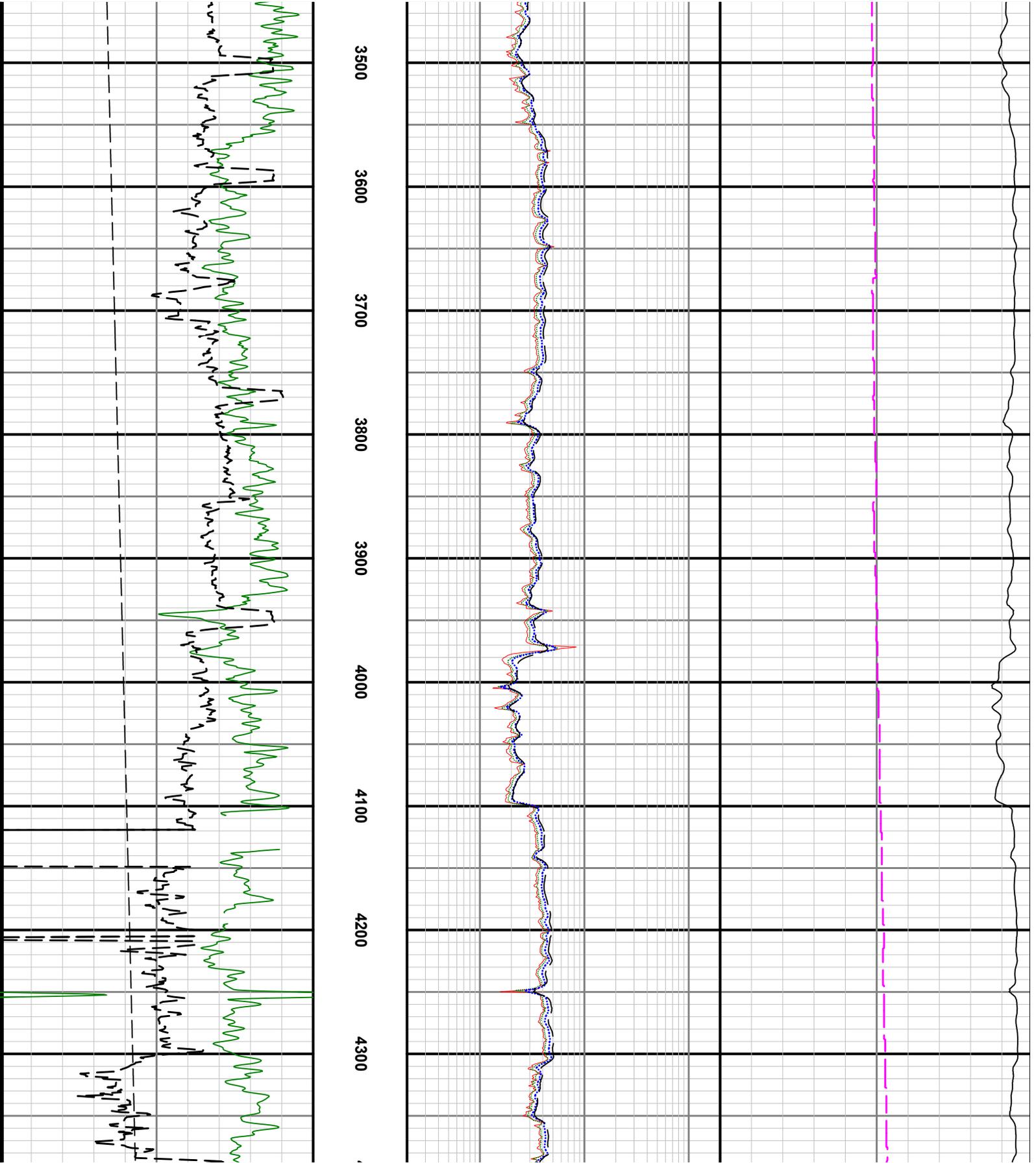
Presented Curves	Description	Units
CACLM	Conductivity Attenuation - Corrected - 400kHz	mmho/m
RACHM	Resistivity Attenuation - Corrected - 2MHz	ohm.m
RACLM	Resistivity Attenuation - Corrected - 400kHz	ohm.m
RPCHM	Resistivity Phase - Corrected - 2MHz	ohm.m
RPCLM	Resistivity Phase - Corrected - 400kHz	ohm.m
ROPA	Depth Averaged ROP 3 ft Average	ft/h
TVD	True Vertical Depth	ft
GRAM	OnTrak - Gamma Ray - Apparent - Memory 3 ft Average	API
TCDM	Downhole Temperature	degF

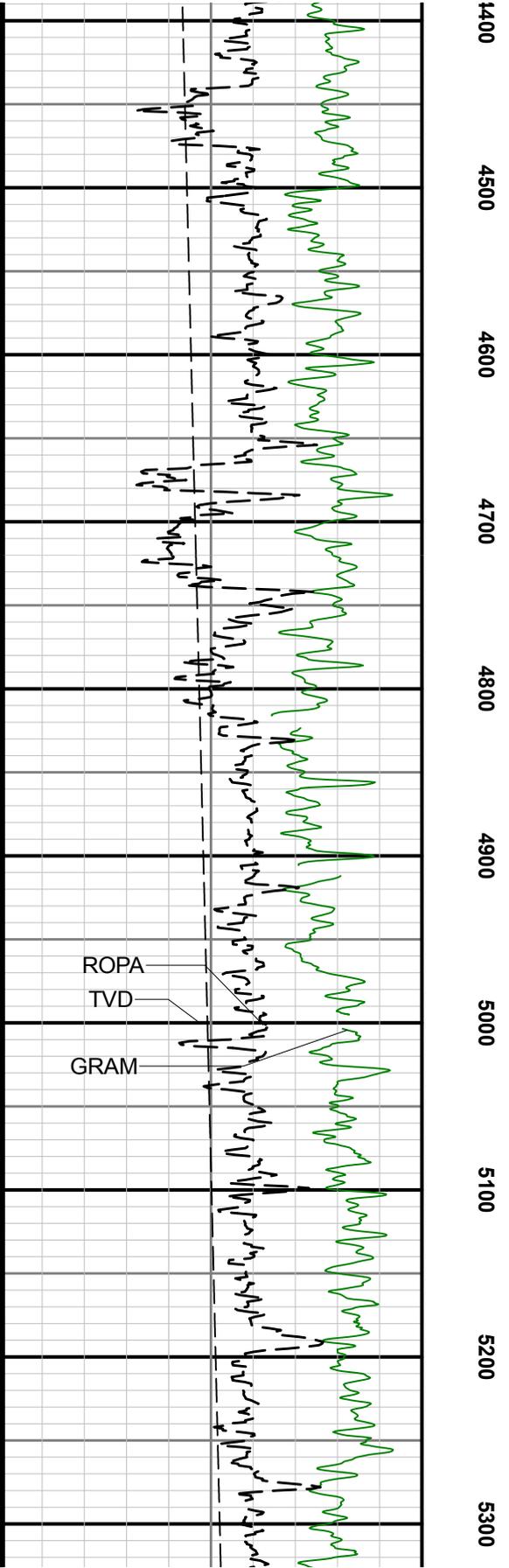
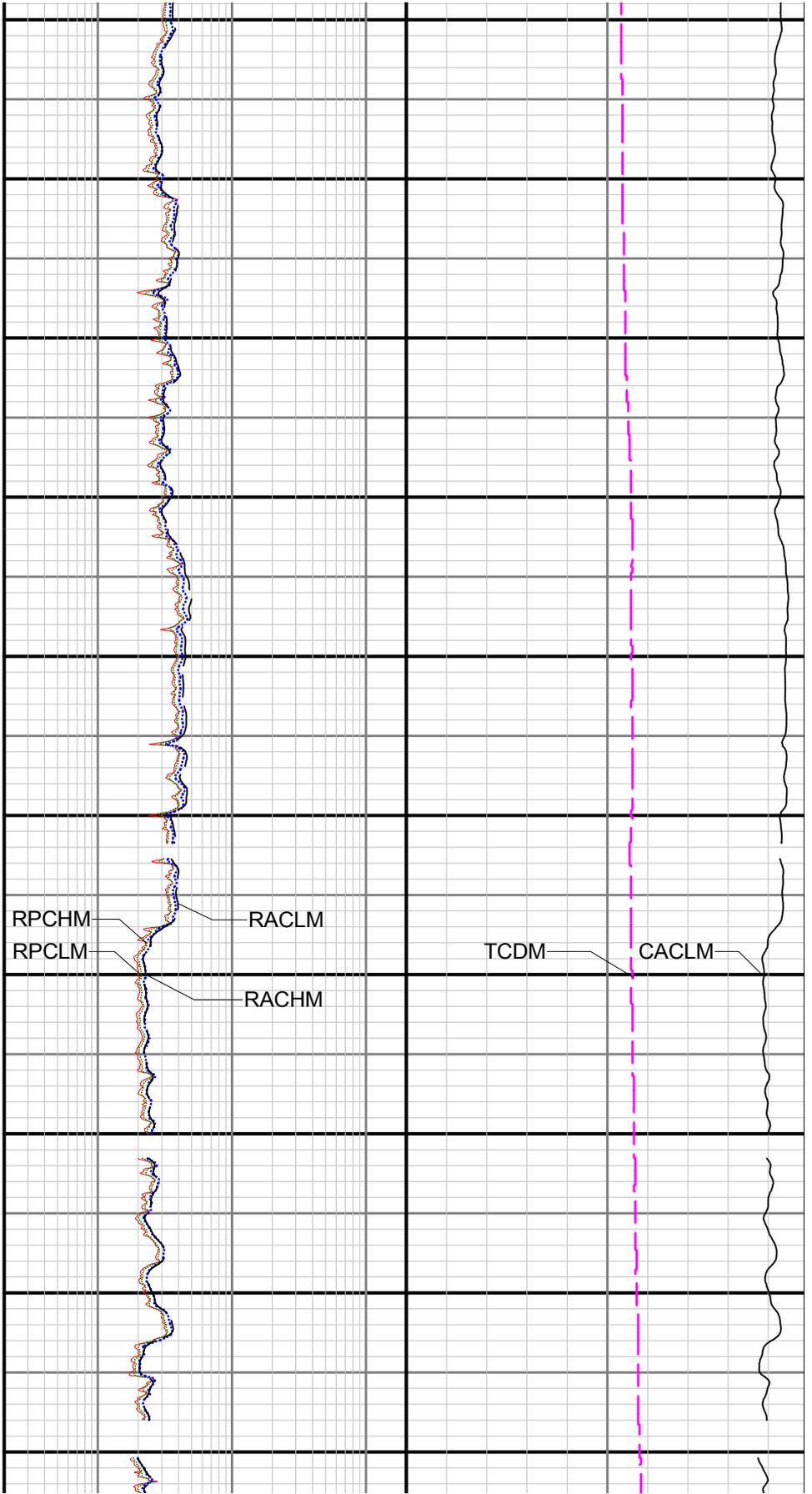
	<b>Company</b>	Verdad Oil & Gas Corporation		
	<b>Well</b>	Lost Creek 03-62-08-2H		
	<b>Interval</b>	<b>Date From:</b> 2017-05-16 20:23:00	<b>Top:</b> 1720.00	<b>Date To:</b> 2017-06-17 03:08:27
<b>Created</b>	2017-06-18 07:37:09	<b>Bottom:</b> 5780.00		

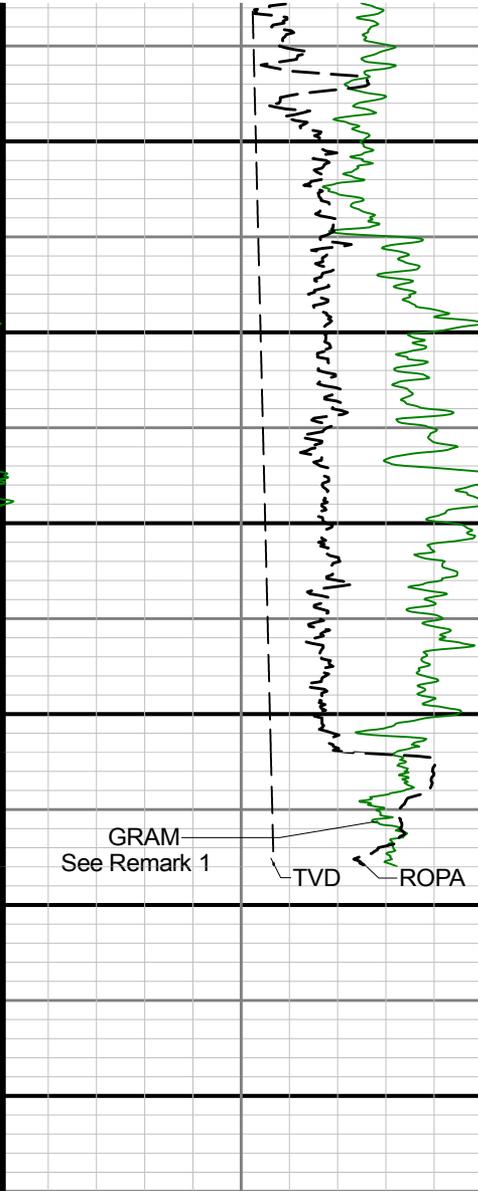
Gamma Ray - Apparent 3 ft Average [GRAM] 0 150	<b>MD 1:1200 feet</b>	Resistivity Phase - Corrected - 2MHz [RPCHM] 0.2 200	Conductivity Attenuation - Corrected - 400kHz [CACLM] 4000 0
API		ohm.m	mmho/m
Depth Averaged ROP 3 ft Average [ROPA] 1200 0		Resistivity Phase - Corrected - 400kHz [RPCLM] 0.2 200	Downhole Temperature [TCDM] 0 250
ft/h		ohm.m	degF
True Vertical Depth [TVD] 0 10000		Resistivity Attenuation - Corrected - 2MHz [RACHM] 0.2 200	
ft		ohm.m	
		Resistivity Attenuation - Corrected - 400kHz [RACLM] 0.2 200	
		ohm.m	



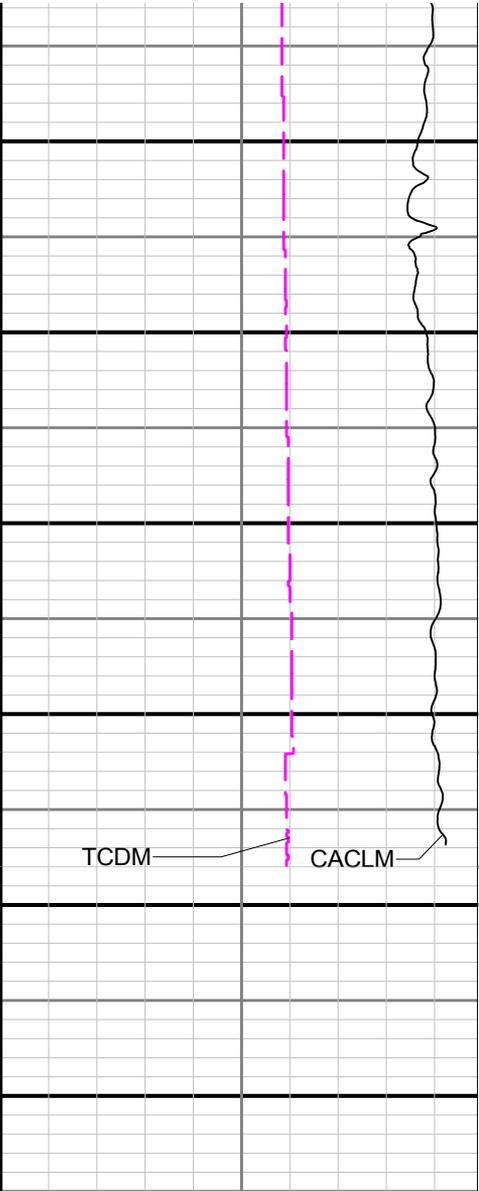
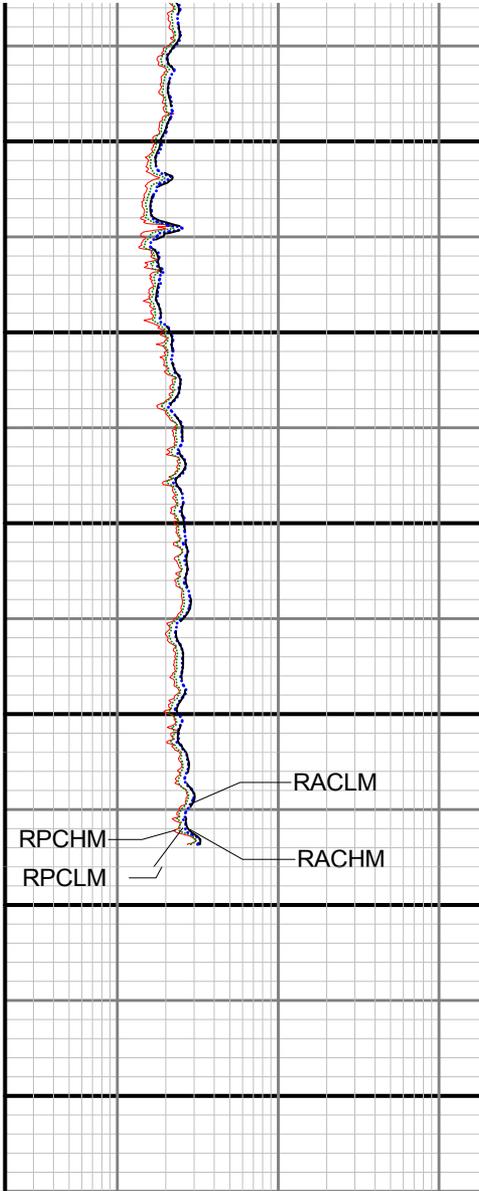








5400  
5500  
5600  
5700  
5800  
5900



Gamma Ray - Apparent 3 ft Average [GRAM]	0	150
API		
Depth Averaged ROP 3 ft Average [ROPA]	1200	0
ft/h		
True Vertical Depth [TVD]	0	10000
ft		

MD 1:1200 feet

Resistivity Phase - Corrected - 2MHz [RPCHM]	0.2	200
ohm.m		
Resistivity Phase - Corrected - 400kHz [RPCLM]	0.2	200
ohm.m		
Resistivity Attenuation - Corrected - 2MHz [RACHM]	0.2	200
ohm.m		
Resistivity Attenuation - Corrected - 400kHz [RACLM]	0.2	200
ohm.m		

Conductivity Attenuation - Corrected - 400kHz [CACLM]	4000	0
mmho/m		
Downhole Temperature [TCDM]	0	250
degF		