ENSIGN Directional

Josephine 19O-314

TVD
2":100’

Company: PDC Energy Inc.
Well Name: Joesphine 19O-314
API:
County/Parish: WELD
State: CO
Country: USA
Job number: 158-80
Field: WATTENBERG
Rig Id: Ensign 158
Survey Company: Ensign
Operator: Petroleum Development Corp.
Company Man: Dean Haight/Shane Paris

Daylight DD: Breven Williams
Night DD: TJ Simpson

Daylight MWD: Justin Klatt
Night MWD: Roy Montante

Log measurements: Gamma, ROP
Depth measured from:
Maximum temperature:

	Depth	**Date**
Start:	0 ft	8/22/2017
End:	ft	

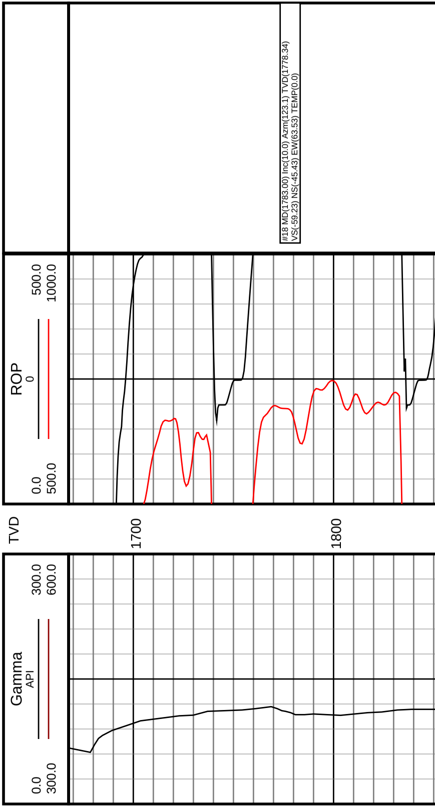
Casing	**Depth**	**Size**
Surface:	1695 ft	9 5/8"
Intermediate:		

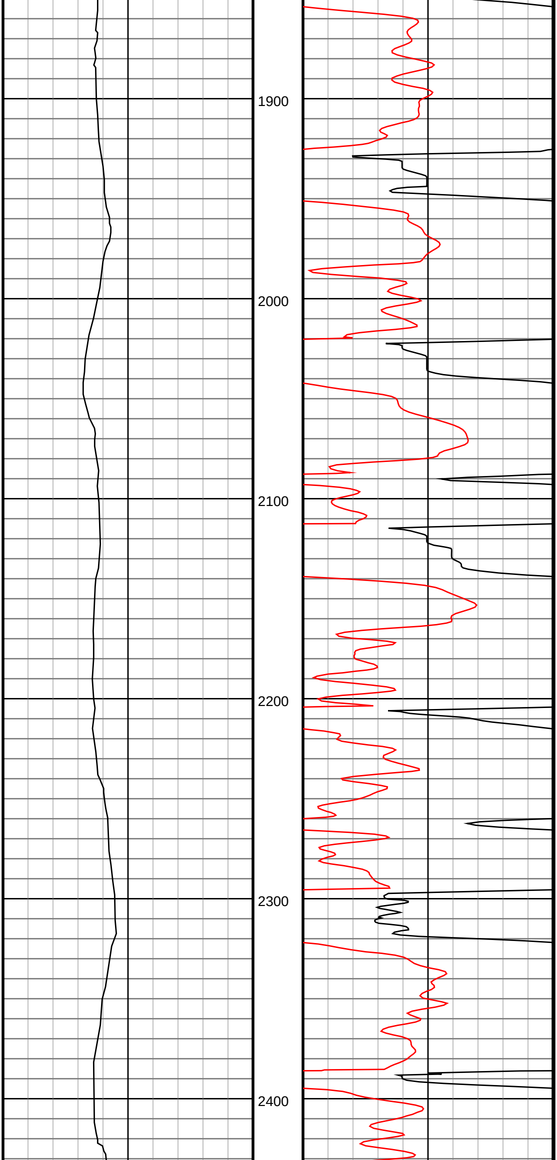
Mud Type: H2O
Density:
Viscosity:
Rm: **Rmf:** **Rmc:**

Elevations
KB: 4649 ft
GL: 4626 ft
DF: 4649 ft

		Offsets		**Depths**		**Dates**	
Run	**Bit Size**	**Gamma**	**Survey**	**Start**	**End**	**Start**	**End**
1	12.25"		60.97 ft	0 ft	1695 ft	8/22/2017	08/23/2017
2	8.5"	62.25 ft	57.25 ft	1695 ft		8/24/2017	
3							
4							
5							
6							
7							
8							
9							
10							

Ensign uses its best efforts to provide its customers with accurate information and interpretations in conjunction with services performed but will not be held liable or responsible for the accuracy of such information or interpretation.





#19 MD(1879.00) Inc(11.8) Azm(120.4) TVD(1872.60)
VS(-73.77) NS(-54.95) EW(78.98) TEMP(0.0)

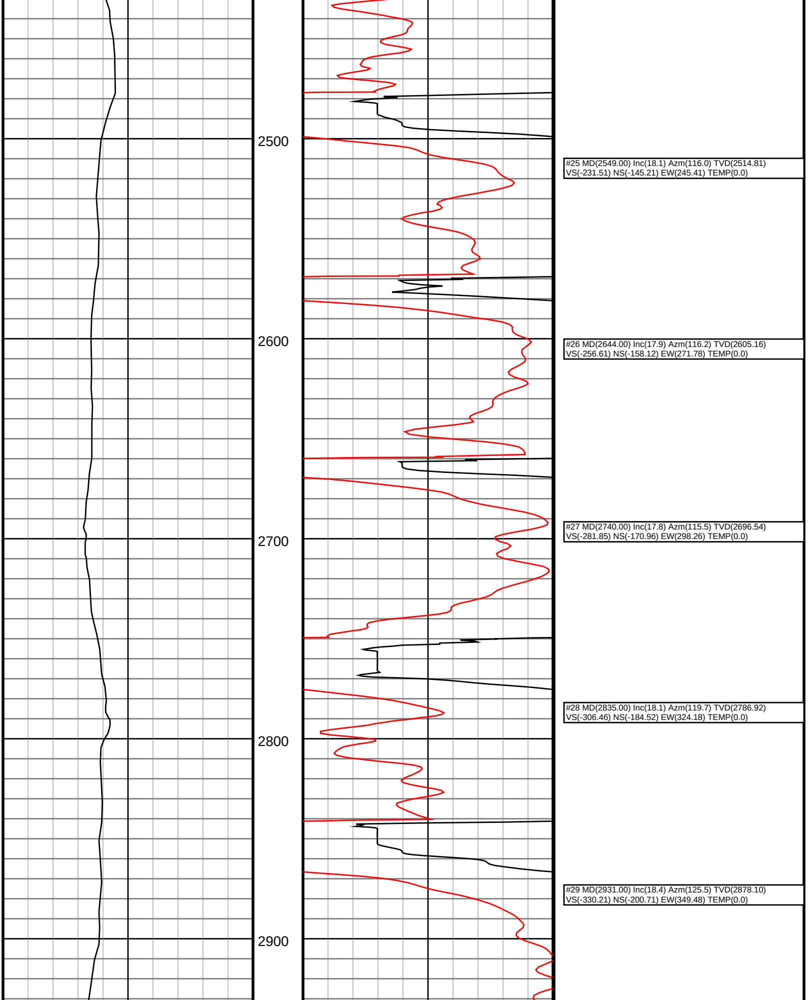
#20 MD(1975.00) Inc(13.7) Azm(120.3) TVD(1966.23)
VS(-91.03) NS(-65.65) EW(97.26) TEMP(0.0)

#21 MD(2071.00) Inc(15.6) Azm(121.0) TVD(2059.10)
VS(-110.72) NS(-78.04) EW(118.14) TEMP(0.0)

#22 MD(2166.00) Inc(17.8) Azm(122.4) TVD(2150.09)
VS(-132.57) NS(-92.40) EW(141.36) TEMP(0.0)

#23 MD(2262.00) Inc(16.8) Azm(121.0) TVD(2241.75)
VS(-155.41) NS(-107.40) EW(165.64) TEMP(0.0)

#24 MD(2357.00) Inc(18.2) Azm(113.2) TVD(2332.36)
VS(-179.57) NS(-120.32) EW(191.05) TEMP(0.0)



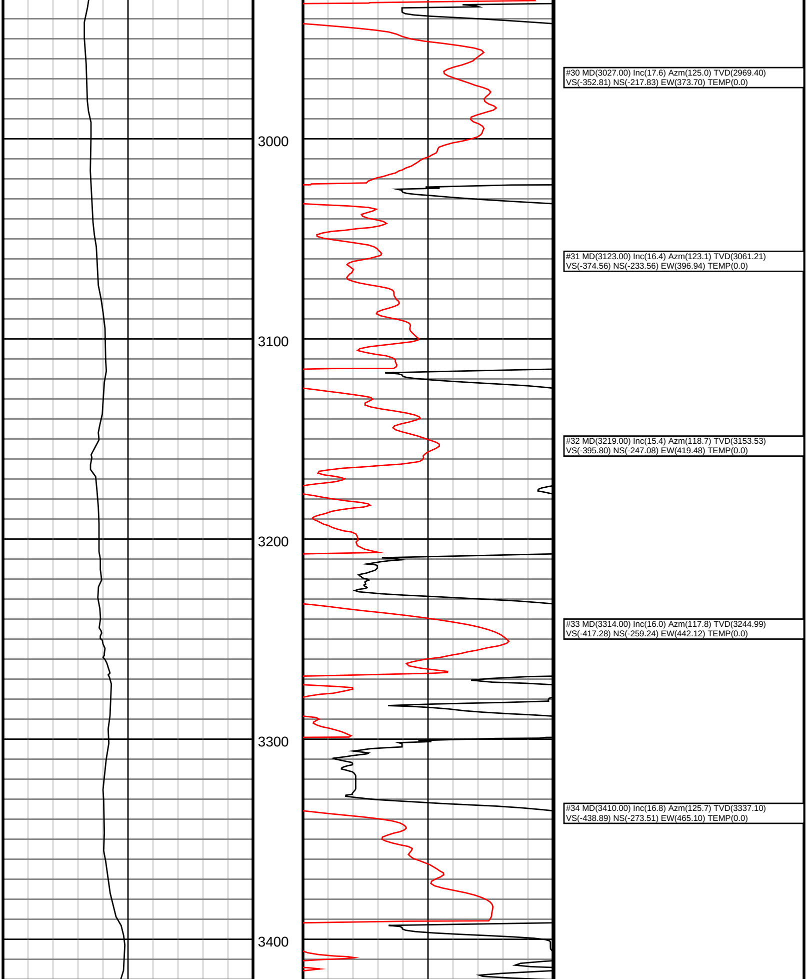
#25 MD(2549.00) Inc(18.1) Azm(116.0) TVD(2514.81)
VS(-231.51) NS(-145.21) EW(245.41) TEMP(0.0)

#26 MD(2644.00) Inc(17.9) Azm(116.2) TVD(2605.16)
VS(-256.61) NS(-158.12) EW(271.78) TEMP(0.0)

#27 MD(2740.00) Inc(17.8) Azm(115.5) TVD(2696.54)
VS(-281.85) NS(-170.96) EW(298.26) TEMP(0.0)

#28 MD(2835.00) Inc(18.1) Azm(119.7) TVD(2786.92)
VS(-306.46) NS(-184.52) EW(324.18) TEMP(0.0)

#29 MD(2931.00) Inc(18.4) Azm(125.5) TVD(2878.10)
VS(-330.21) NS(-200.71) EW(349.48) TEMP(0.0)



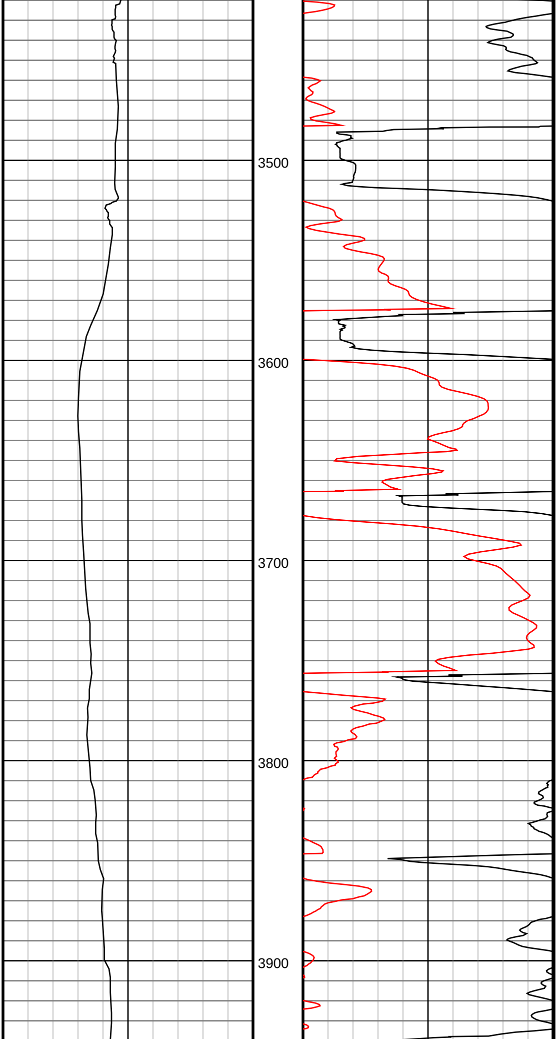
#30 MD(3027.00) Inc(17.6) Azm(125.0) TVD(2969.40)
VS(-352.81) NS(-217.83) EW(373.70) TEMP(0.0)

#31 MD(3123.00) Inc(16.4) Azm(123.1) TVD(3061.21)
VS(-374.56) NS(-233.56) EW(396.94) TEMP(0.0)

#32 MD(3219.00) Inc(15.4) Azm(118.7) TVD(3153.53)
VS(-395.80) NS(-247.08) EW(419.48) TEMP(0.0)

#33 MD(3314.00) Inc(16.0) Azm(117.8) TVD(3244.99)
VS(-417.28) NS(-259.24) EW(442.12) TEMP(0.0)

#34 MD(3410.00) Inc(16.8) Azm(125.7) TVD(3337.10)
VS(-438.89) NS(-273.51) EW(465.10) TEMP(0.0)



#35 MD(3506.00) Inc(14.8) Azm(121.0) TVD(3429.47)
VS(-459.30) NS(-287.92) EW(486.88) TEMP(0.0)

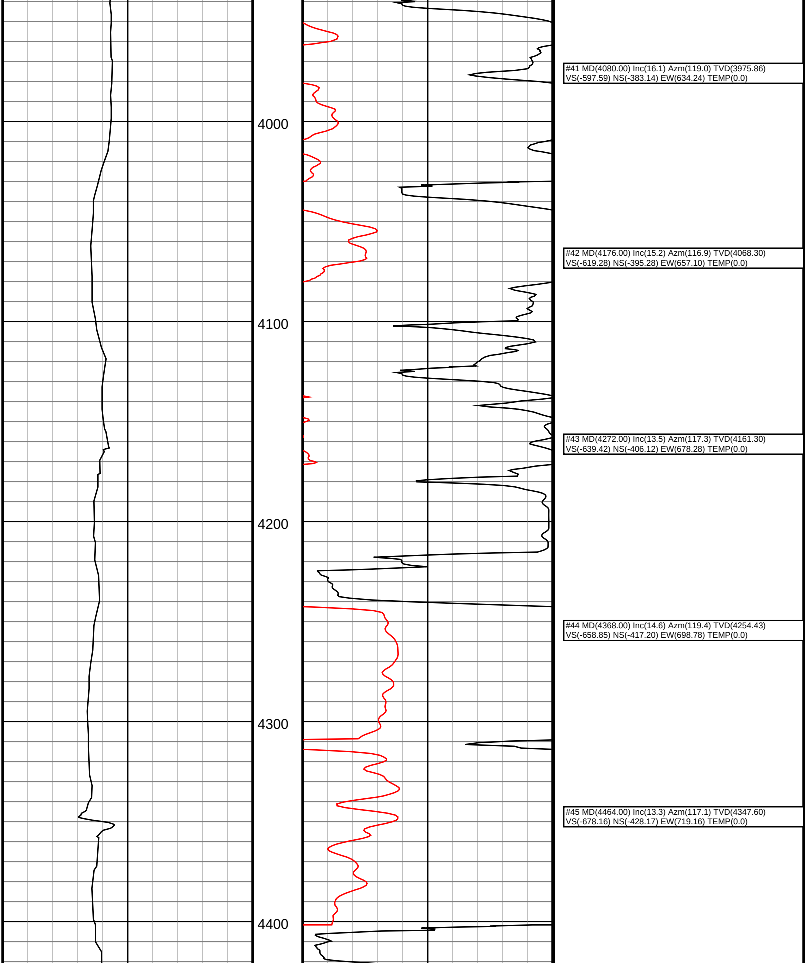
#36 MD(3601.00) Inc(17.3) Azm(125.0) TVD(3520.76)
VS(-479.91) NS(-302.28) EW(508.85) TEMP(0.0)

#37 MD(3697.00) Inc(18.7) Azm(125.0) TVD(3612.06)
VS(-502.59) NS(-319.29) EW(533.15) TEMP(0.0)

#38 MD(3793.00) Inc(19.0) Azm(123.8) TVD(3702.91)
VS(-526.52) NS(-336.81) EW(558.74) TEMP(0.0)

#39 MD(3889.00) Inc(18.7) Azm(121.7) TVD(3793.76)
VS(-551.01) NS(-353.59) EW(584.82) TEMP(0.0)

#40 MD(3984.00) Inc(17.7) Azm(121.3) TVD(3884.01)
VS(-574.82) NS(-369.10) EW(610.12) TEMP(0.0)



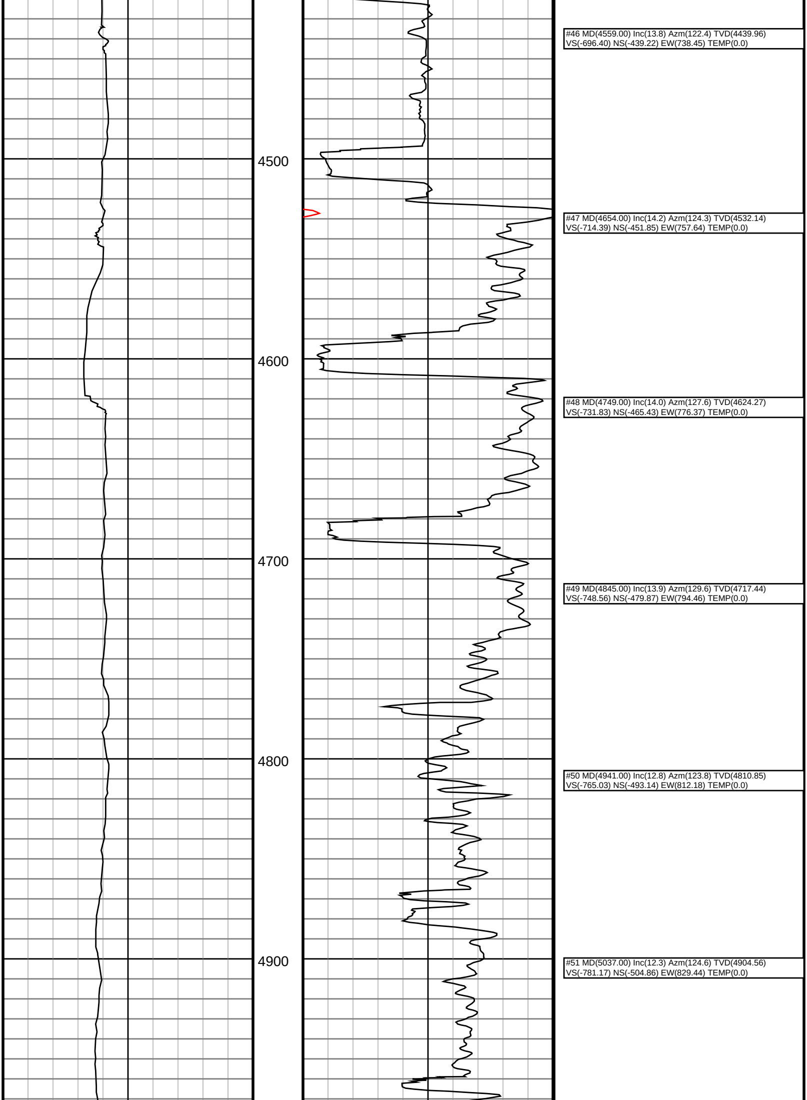
#41 MD(4080.00) Inc(16.1) Azm(119.0) TVD(3975.86)
VS(-597.59) NS(-383.14) EW(634.24) TEMP(0.0)

#42 MD(4176.00) Inc(15.2) Azm(116.9) TVD(4068.30)
VS(-619.28) NS(-395.28) EW(657.10) TEMP(0.0)

#43 MD(4272.00) Inc(13.5) Azm(117.3) TVD(4161.30)
VS(-639.42) NS(-406.12) EW(678.28) TEMP(0.0)

#44 MD(4368.00) Inc(14.6) Azm(119.4) TVD(4254.43)
VS(-658.85) NS(-417.20) EW(698.78) TEMP(0.0)

#45 MD(4464.00) Inc(13.3) Azm(117.1) TVD(4347.60)
VS(-678.16) NS(-428.17) EW(719.16) TEMP(0.0)



#46 MD(4559.00) Inc(13.8) Azm(122.4) TVD(4439.96)
VS(-696.40) NS(-439.22) EW(738.45) TEMP(0.0)

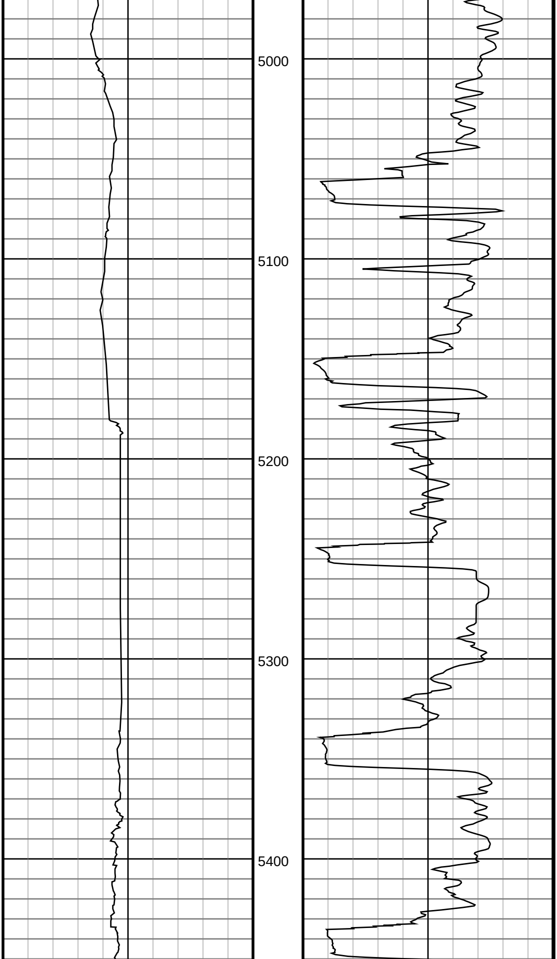
#47 MD(4654.00) Inc(14.2) Azm(124.3) TVD(4532.14)
VS(-714.39) NS(-451.85) EW(757.64) TEMP(0.0)

#48 MD(4749.00) Inc(14.0) Azm(127.6) TVD(4624.27)
VS(-731.83) NS(-465.43) EW(776.37) TEMP(0.0)

#49 MD(4845.00) Inc(13.9) Azm(129.6) TVD(4717.44)
VS(-748.56) NS(-479.87) EW(794.46) TEMP(0.0)

#50 MD(4941.00) Inc(12.8) Azm(123.8) TVD(4810.85)
VS(-765.03) NS(-493.14) EW(812.18) TEMP(0.0)

#51 MD(5037.00) Inc(12.3) Azm(124.6) TVD(4904.56)
VS(-781.17) NS(-504.86) EW(829.44) TEMP(0.0)



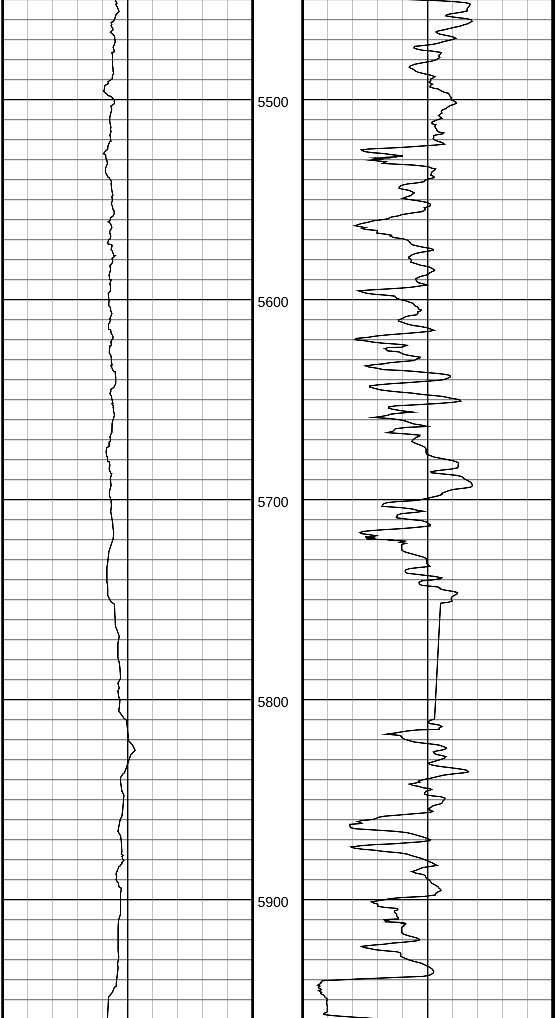
#52 MD(5132.00) Inc(12.0) Azm(123.6) TVD(4997.43)
VS(-796.66) NS(-516.07) EW(845.99) TEMP(0.0)

#53 MD(5228.00) Inc(9.8) Azm(132.6) TVD(5091.70)
VS(-809.95) NS(-527.12) EW(860.32) TEMP(0.0)

#54 MD(5324.00) Inc(6.5) Azm(131.7) TVD(5186.72)
VS(-819.17) NS(-536.27) EW(870.39) TEMP(0.0)

#55 MD(5419.00) Inc(5.0) Azm(121.0) TVD(5281.24)
VS(-826.20) NS(-541.98) EW(877.96) TEMP(0.0)

#56 MD(5515.00) Inc(2.5) Azm(96.2) TVD(5377.03)
VS(-831.63) NS(-544.36) EW(883.63) TEMP(0.0)



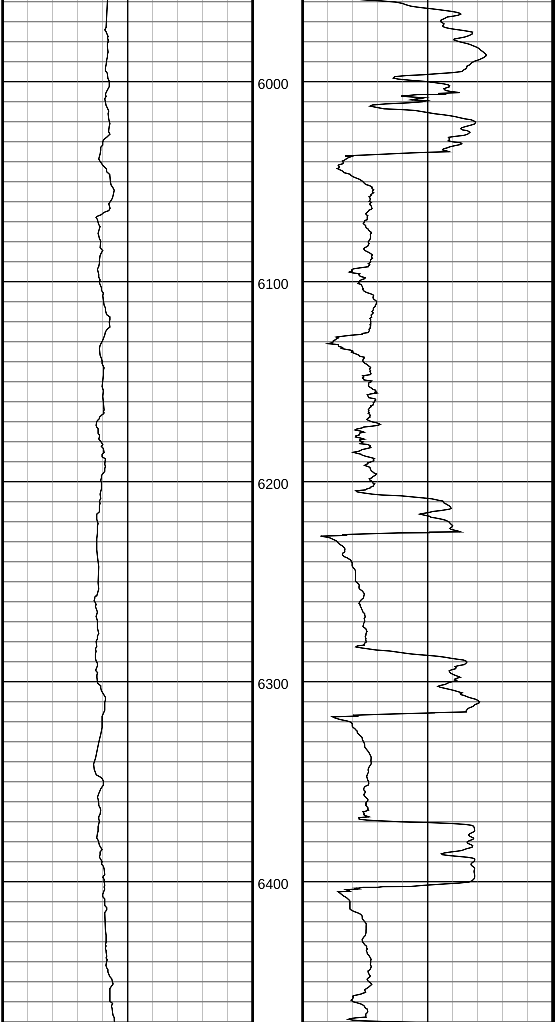
#57 MD(5610.00) Inc(0.7) Azm(175.6) TVD(5472.00)
VS(-833.65) NS(-545.16) EW(885.73) TEMP(0.0)

#58 MD(5706.00) Inc(0.9) Azm(129.4) TVD(5567.99)
VS(-834.18) NS(-546.23) EW(886.36) TEMP(0.0)

#59 MD(5801.00) Inc(2.0) Azm(139.2) TVD(5662.96)
VS(-835.68) NS(-547.96) EW(888.02) TEMP(0.0)

#60 MD(5897.00) Inc(2.5) Azm(130.8) TVD(5758.88)
VS(-838.12) NS(-550.59) EW(890.70) TEMP(0.0)

#61 MD(5992.00) Inc(3.0) Azm(122.5) TVD(5853.77)
VS(-841.53) NS(-553.28) EW(894.36) TEMP(0.0)



#62 MD(6118.00) Inc(3.5) Azm(89.8) TVD(5979.58)
VS(-847.97) NS(-555.04) EW(900.99) TEMP(149.3)

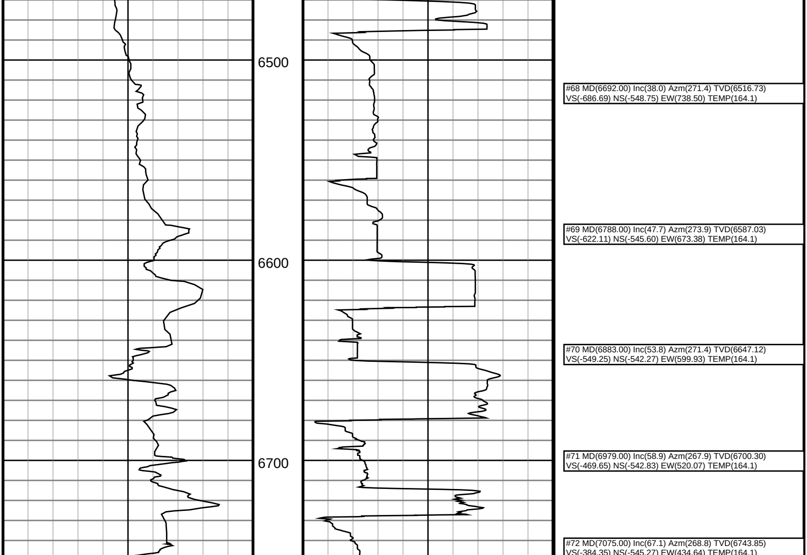
#63 MD(6214.00) Inc(1.0) Azm(260.8) TVD(6075.53)
VS(-850.06) NS(-555.16) EW(903.10) TEMP(149.3)

#64 MD(6310.00) Inc(10.9) Azm(265.6) TVD(6170.90)
VS(-840.12) NS(-556.00) EW(893.19) TEMP(149.3)

#65 MD(6405.00) Inc(18.6) Azm(273.0) TVD(6262.71)
VS(-816.10) NS(-555.89) EW(869.07) TEMP(149.3)

#66 MD(6501.00) Inc(24.0) Azm(274.4) TVD(6352.12)
VS(-781.67) NS(-553.59) EW(834.29) TEMP(149.3)

#67 MD(6597.00) Inc(29.5) Azm(273.2) TVD(6437.81)
VS(-738.99) NS(-550.77) EW(791.19) TEMP(164.1)



#68 MD(6692.00) Inc(38.0) Azm(271.4) TVD(6516.73)
VS(-686.69) NS(-548.75) EW(738.50) TEMP(164.1)

#69 MD(6788.00) Inc(47.7) Azm(273.9) TVD(6587.03)
VS(-622.11) NS(-545.60) EW(673.38) TEMP(164.1)

#70 MD(6883.00) Inc(53.8) Azm(271.4) TVD(6647.12)
VS(-549.25) NS(-542.27) EW(599.93) TEMP(164.1)

#71 MD(6979.00) Inc(58.9) Azm(267.9) TVD(6700.30)
VS(-469.65) NS(-542.83) EW(520.07) TEMP(164.1)

#72 MD(7075.00) Inc(67.1) Azm(268.8) TVD(6743.85)
VS(-384.35) NS(-545.27) EW(434.64) TEMP(164.1)

#73 MD(7170.00) Inc(75.4) Azm(269.8) TVD(6774.36)
VS(-294.74) NS(-546.35) EW(344.77) TEMP(164.1)

#133 MD(12874.00) Inc(90.0) Azm(267.0) TVD(6792.23)
VS(5378.03) NS(-497.35) EW(-5355.01) TEMP(1.2)