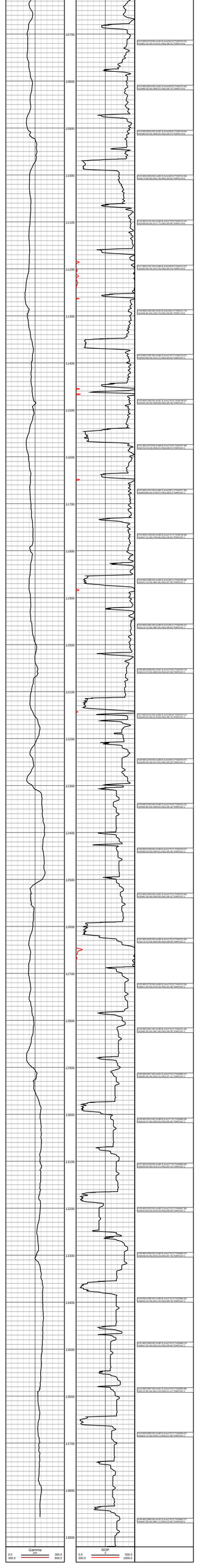

ENSIGN Directional

Ehrlich 5M-243

MD
2":100'

Company: Petroleum Development Corp.
Well Name: Ehrlich 5M-243
API: 05-123-43547-0000
County/Parish: WELD
State: COLORADO
Country: UNITED STATES
Job number: 158-207-60
Field: WATTENBURG
Rig Id: Ensign 158
Survey Company: Ensign Directional Services
Operator: Petroleum Development Corp.
Company Man: Dean Haight/Shane Paris
Daylight DD: Breven Williams/Tyler Batchelder
Night DD: David Van Dorin
Daylight MWD: Louie Ascione/ Justin Klatt
Night MWD: Matt Mason

Log measurements: Gamma, ROP
Depth measured from: 1665 ft
Maximum temperature:

	Depth	Date
Start:	0 ft	04/17/17
End:	13920 ft	04/21/17

Casing	Depth	Size
Surface:	1674 ft	9 5/8"
Intermediate:		

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

Elevations
KB: 4664 ft
GL: 4641 ft
DF: 4664 ft

Run	Bit Size	Offsets		Depths		Dates	
		Gamma	Survey	Start	End	Start	End
1	12.25"		60.48 ft	0 ft	1690 ft	04/17/17	04/17/17
2	8.5"	62.57 ft	57.57 ft	1690 ft	3758 ft	04/18/17	04/18/17
3	8.5"	62.57 ft	57.57 ft	3758 ft	13828 ft	04/18/17	04/21/17
4							
5							
6							
7							
8							
9							
10							

Ensign Directional Services 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.

#17 MD(1630.00) Inc(11.2) Azm(69.9) TVD(1603.94) VS(-32.07) NS(72.86) EW(234.15) TEMP(0.0)
#18 MD(1691.00) Inc(10.0) Azm(67.8) TVD(1663.90) VS(-34.27) NS(76.90) EW(244.62) TEMP(0.0)
#19 MD(1787.00) Inc(10.6) Azm(70.2) TVD(1758.36) VS(-37.60) NS(83.04) EW(260.64) TEMP(0.0)
#20 MD(1883.00) Inc(12.6) Azm(74.1) TVD(1852.39) VS(-40.26) NS(88.90) EW(279.02) TEMP(0.0)
#21 MD(1979.00) Inc(14.1) Azm(71.6) TVD(1945.80) VS(-43.13) NS(95.46) EW(300.19) TEMP(0.0)
#22 MD(2074.00) Inc(16.0) Azm(74.6) TVD(2037.53) VS(-46.15) NS(102.59) EW(323.80) TEMP(0.0)
#23 MD(2170.00) Inc(14.9) Azm(72.3) TVD(2130.06) VS(-49.15) NS(109.85) EW(348.31) TEMP(0.0)
#24 MD(2266.00) Inc(13.7) Azm(70.8) TVD(2223.09) VS(-52.72) NS(117.34) EW(370.81) TEMP(0.0)
#25 MD(2362.00) Inc(15.5) Azm(76.0) TVD(2315.99) VS(-55.53) NS(124.19) EW(393.99) TEMP(0.0)
#26 MD(2458.00) Inc(14.8) Azm(74.5) TVD(2408.65) VS(-57.70) NS(130.57) EW(418.25) TEMP(0.0)
#27 MD(2554.00) Inc(15.5) Azm(73.6) TVD(2501.32) VS(-60.40) NS(137.47) EW(442.37) TEMP(0.0)
#28 MD(2649.00) Inc(14.4) Azm(79.4) TVD(2593.10) VS(-62.04) NS(143.22) EW(466.17) TEMP(0.0)
#29 MD(2745.00) Inc(16.3) Azm(77.3) TVD(2685.68) VS(-62.90) NS(148.38) EW(491.04) TEMP(0.0)
#30 MD(2841.00) Inc(16.1) Azm(75.5) TVD(2777.86) VS(-64.69) NS(154.68) EW(517.07) TEMP(0.0)
#31 MD(2937.00) Inc(15.7) Azm(74.8) TVD(2870.19) VS(-67.02) NS(161.41) EW(542.50) TEMP(0.0)
#32 MD(3033.00) Inc(15.6) Azm(72.5) TVD(2962.63) VS(-69.98) NS(168.70) EW(567.34) TEMP(0.0)
#33 MD(3128.00) Inc(14.4) Azm(72.3) TVD(3054.39) VS(-73.33) NS(176.13) EW(590.78) TEMP(0.0)
#34 MD(3224.00) Inc(14.5) Azm(66.9) TVD(3147.36) VS(-77.75) NS(184.48) EW(613.21) TEMP(0.0)
#35 MD(3320.00) Inc(13.9) Azm(65.0) TVD(3240.43) VS(-83.55) NS(194.07) EW(634.71) TEMP(0.0)
#36 MD(3416.00) Inc(14.9) Azm(67.4) TVD(3333.41) VS(-89.32) NS(203.68) EW(656.56) TEMP(0.0)
#37 MD(3511.00) Inc(13.5) Azm(66.9) TVD(3425.51) VS(-94.59) NS(212.73) EW(678.03) TEMP(0.0)
#38 MD(3608.00) Inc(14.3) Azm(69.2) TVD(3519.67) VS(-99.49) NS(221.43) EW(699.65) TEMP(0.0)
#39 MD(3703.00) Inc(15.2) Azm(69.5) TVD(3611.54) VS(-104.05) NS(229.95) EW(722.28) TEMP(0.0)
#40 MD(3799.00) Inc(15.3) Azm(69.0) TVD(3704.16) VS(-108.86) NS(238.90) EW(745.89) TEMP(0.0)
#41 MD(3895.00) Inc(15.2) Azm(69.5) TVD(3796.77) VS(-113.67) NS(247.85) EW(769.51) TEMP(0.0)
#42 MD(3990.00) Inc(15.5) Azm(68.1) TVD(3888.39) VS(-118.66) NS(256.94) EW(792.95) TEMP(0.0)
#43 MD(4086.00) Inc(14.7) Azm(66.5) TVD(3981.07) VS(-124.24) NS(266.58) EW(816.02) TEMP(0.0)
#44 MD(4181.00) Inc(14.9) Azm(75.0) TVD(4072.93) VS(-128.22) NS(274.55) EW(838.88) TEMP(0.0)
#45 MD(4277.00) Inc(15.4) Azm(73.8) TVD(4165.59) VS(-130.77) NS(281.30) EW(863.04) TEMP(0.0)
#46 MD(4373.00) Inc(13.5) Azm(73.9) TVD(4258.55) VS(-133.43) NS(287.97) EW(886.05) TEMP(0.0)
#47 MD(4468.00) Inc(13.8) Azm(77.4) TVD(4350.87) VS(-135.22) NS(293.51) EW(907.76) TEMP(0.0)
#48 MD(4564.00) Inc(15.3) Azm(74.3) TVD(4443.79) VS(-137.09) NS(299.44) EW(931.13) TEMP(0.0)
#49 MD(4660.00) Inc(14.1) Azm(73.2) TVD(4536.65) VS(-139.83) NS(306.25) EW(954.52) TEMP(0.0)
#50 MD(4755.00) Inc(14.6) Azm(74.3) TVD(4628.68) VS(-142.48) NS(312.83) EW(977.12) TEMP(0.0)
#51 MD(4851.00) Inc(15.8) Azm(75.3) TVD(4721.32) VS(-144.86) NS(319.42) EW(1001.41) TEMP(0.0)
#52 MD(4947.00) Inc(13.7) Azm(73.6) TVD(4814.15) VS(-147.29) NS(325.95) EW(1024.96) TEMP(0.0)
#53 MD(5042.00) Inc(14.5) Azm(67.8) TVD(4906.30) VS(-151.15) NS(333.62) EW(1046.77) TEMP(0.0)
#54 MD(5138.00) Inc(13.2) Azm(65.7) TVD(4999.50) VS(-156.49) NS(342.67) EW(1067.88) TEMP(0.0)
#55 MD(5233.00) Inc(14.2) Azm(64.3) TVD(5091.80) VS(-162.41) NS(352.19) EW(1088.27) TEMP(0.0)
#56 MD(5329.00) Inc(12.1) Azm(59.3) TVD(5185.28) VS(-169.24) NS(362.43) EW(1107.53) TEMP(0.0)
#57 MD(5425.00) Inc(9.6) Azm(66.5) TVD(5279.56) VS(-174.73) NS(370.76) EW(1123.53) TEMP(0.0)
#58 MD(5521.00) Inc(9.1) Azm(78.1) TVD(5374.29) VS(-176.91) NS(375.52) EW(1138.30) TEMP(134.5)
#59 MD(5617.00) Inc(8.3) Azm(76.4) TVD(5469.19) VS(-177.66) NS(378.72) EW(1152.46) TEMP(134.5)
#60 MD(5713.00) Inc(7.6) Azm(75.2) TVD(5564.27) VS(-178.68) NS(381.97) EW(1165.34) TEMP(134.5)
#61 MD(5808.00) Inc(5.8) Azm(68.5) TVD(5658.61) VS(-180.20) NS(385.33) EW(1175.88) TEMP(134.5)
#62 MD(5904.00) Inc(4.5) Azm(67.4) TVD(5754.22) VS(-182.03) NS(388.56) EW(1183.87) TEMP(134.5)
#63 MD(5999.00) Inc(2.7) Azm(89.2) TVD(5849.04) VS(-182.51) NS(390.02) EW(1189.55) TEMP(134.5)
#64 MD(6095.00) Inc(1.1) Azm(100.3) TVD(5944.98) VS(-181.84) NS(389.89) EW(1192.72) TEMP(134.5)
#65 MD(6191.00) Inc(4.4) Azm(171.8) TVD(6040.87) VS(-177.84) NS(386.08) EW(1194.15) TEMP(134.5)
#66 MD(6287.00) Inc(9.1) Azm(175.5) TVD(6136.18) VS(-166.59) NS(374.86) EW(1195.27) TEMP(149.3)
#67 MD(6383.00) Inc(15.3) Azm(178.5) TVD(6229.97) VS(-146.48) NS(354.61) EW(1196.20) TEMP(149.3)
#68 MD(6479.00) Inc(21.6) Azm(186.3) TVD(6321.00) VS(-116.93) NS(324.35) EW(1194.59) TEMP(149.3)
#69 MD(6574.00) Inc(30.1) Azm(189.6) TVD(6406.42) VS(-77.58) NS(283.40) EW(1188.69) TEMP(149.3)
#70 MD(6670.00) Inc(39.1) Azm(187.8) TVD(6485.37) VS(-25.90) NS(229.56) EW(1180.55) TEMP(149.3)
#71 MD(6766.00) Inc(49.8) Azm(181.0) TVD(6553.84) VS(39.20) NS(162.68) EW(1175.78) TEMP(149.3)
#72 MD(6862.00) Inc(59.3) Azm(179.9) TVD(6609.45) VS(116.08) NS(84.57) EW(1175.21) TEMP(149.3)
#73 MD(6957.00) Inc(63.0) Azm(181.3) TVD(6655.29) VS(197.91) NS(1.38) EW(1174.32) TEMP(149.3)
#74 MD(7053.00) Inc(69.6) Azm(177.5) TVD(6693.86) VS(284.63) NS(-86.45) EW(1175.32) TEMP(149.3)
#75 MD(7149.00) Inc(78.3) Azm(177.5) TVD(6720.38) VS(376.06) NS(-178.53) EW(1179.34) TEMP(149.3)
#76 MD(7245.00) Inc(82.5) Azm(179.2) TVD(6736.39) VS(469.74) NS(-273.12) EW(1182.05) TEMP(149.3)
#77 MD(7340.00) Inc(86.4) Azm(178.3) TVD(6745.57) VS(563.24) NS(-367.63) EW(1184.12) TEMP(149.3)
#78 MD(7435.00) Inc(91.7) Azm(178.5) TVD(6747.15) VS(657.23) NS(-462.55) EW(1186.77) TEMP(149.3)
#79 MD(7531.00) Inc(91.6) Azm(178.7) TVD(6744.38) VS(752.16) NS(-558.48) EW(1189.11) TEMP(149.3)
#80 MD(7626.00) Inc(91.3) Azm(178.2) TVD(6741.98) VS(846.16) NS(-653.41) EW(1191.68) TEMP(149.3)
#81 MD(7722.00) Inc(91.0) Azm(179.7) TVD(6740.05) VS(941.03) NS(-749.38) EW(1193.44) TEMP(149.3)
#82 MD(7817.00) Inc(90.8) Azm(179.2) TVD(6738.56) VS(1034.79) NS(-844.36) EW(1194.35) TEMP(164.1)
#83 MD(7913.00) Inc(91.2) Azm(178.7) TVD(6736.88) VS(1129.66) NS(-940.33) EW(1196.11) TEMP(164.1)
#84 MD(8009.00) Inc(89.3) Azm(180.6) TVD(6736.47) VS(1224.36) NS(-1036.32) EW(1196.70) TEMP(164.1)
#85 MD(8105.00) Inc(89.3) Azm(179.9) TVD(6737.64) VS(1318.89) NS(-1132.31) EW(1196.28) TEMP(164.1)
#86 MD(8200.00) Inc(89.9) Azm(181.2) TVD(6738.30) VS(1412.34) NS(-1227.30) EW(1195.37) TEMP(164.1)
#87 MD(8296.00) Inc(90.2) Azm(181.2) TVD(6738.22) VS(1506.59) NS(-1323.28) EW(1193.36) TEMP(164.1)
#88 MD(8392.00) Inc(90.5) Azm(180.1) TVD(6737.63) VS(1601.00) NS(-1419.27) EW(1192.27) TEMP(164.1)
#89 MD(8487.00) Inc(90.6) Azm(180.5) TVD(6736.72) VS(1694.54) NS(-1514.26) EW(1191.77) TEMP(164.1)
#90 MD(8583.00) Inc(90.4) Azm(180.8) TVD(6735.88) VS(1788.95) NS(-1610.25) EW(1190.68) TEMP(164.1)
#91 MD(8678.00) Inc(91.2) Azm(180.5) TVD(6734.56) VS(1882.37) NS(-1705.24) EW(1189.60) TEMP(164.1)
#92 MD(8804.00) Inc(91.8) Azm(179.9) TVD(6731.26) VS(2006.43) NS(-1831.19) EW(1189.16) TEMP(164.1)
#93 MD(8900.00) Inc(90.9) Azm(180.6) TVD(6729.00) VS(2100.93) NS(-1927.16) EW(1188.74) TEMP(164.1)
#94 MD(8995.00) Inc(91.5) Azm(180.5) TVD(6727.01) VS(2194.38) NS(-2022.14) EW(1187.83) TEMP(164.1)
#95 MD(9091.00) Inc(90.2) Azm(179.9) TVD(6725.58) VS(2288.91) NS(-2118.12) EW(1187.50) TEMP(164.1)
#96 MD(9186.00) Inc(91.1) Azm(179.6) TVD(6724.50) VS(2382.60) NS(-2213.11) EW(1187.91) TEMP(164.1)
#97 MD(9282.00) Inc(89.9) Azm(180.1) TVD(6723.67) VS(2477.24) NS(-2309.11) EW(1188.16) TEMP(164.1)
#98 MD(9378.00) Inc(90.9) Azm(180.3) TVD(6723.00) VS(2571.79) NS(-2405.10) EW(1187.83) TEMP(164.1)
#99 MD(9474.00) Inc(89.7) Azm(180.1) TVD(6722.49) VS(2666.34) NS(-2501.10) EW(1187.49) TEMP(164.1)
#100 MD(9569.00) Inc(90.4) Azm(180.1) TVD(6722.41) VS(2759.93) NS(-2596.10) EW(1187.33) TEMP(164.1)
#101 MD(9665.00) Inc(91.4) Azm(180.1) TVD(6720.90) VS(2854.50) NS(-2692.09) EW(1187.16) TEMP(164.1)
#102 MD(9761.00) Inc(90.0) Azm(180.6) TVD(6719.73) VS(2948.99) NS(-2788.07) EW(1186.57) TEMP(178.9)
#103 MD(9857.00) Inc(90.7) Azm(180.1) TVD(6719.14) VS(3043.50) NS(-2884.07) EW(1185.99) TEMP(164.1)
#104 MD(9952.00) Inc(89.3) Azm(180.1) TVD(6719.14) VS(3137.09) NS(-2979.07) EW(1185.82) TEMP(178.9)
#105 MD(10048.00) Inc(89.4) Azm(179.4) TVD(6720.23) VS(3231.76) NS(-3075.06) EW(1186.24) TEMP(178.9)
#106 MD(10144.00) Inc(89.9) Azm(178.7) TVD(6720.82) VS(3326.62) NS(-3171.04) EW(1187.83) TEMP(178.9)
#107 MD(10239.00) Inc(90.1) Azm(178.5) TVD(6720.82) VS(3420.61) NS(-3266.01) EW(1190.15) TEMP(178.9)
#108 MD(10335.00) Inc(89.1) Azm(179.6) TVD(6721.49) VS(3515.47) NS(-3362.00) EW(1191.74) TEMP(178.9)
#109 MD(10431.00) Inc(89.2) Azm(179.2) TVD(6722.91) VS(3610.23) NS(-3457.98) EW(1192.75) TEMP(178.9)
#110 MD(10527.00) Inc(88.9) Azm(181.3) TVD(6724.50) VS(3704.75) NS(-3553.96) EW(1192.33) TEMP(178.9)
#111 MD(10622.00) Inc(90.4) Azm(181.3) TVD(6725.09) VS(3797.98) NS(-3648.93) EW(1190.18) TEMP(178.9)

#112 MD(10718.00) Inc(91.0) Azm(181.0) TVD(6723.91)
VS(3892.23) NS(-3744.91) EW(1188.25) TEMP(178.9)

#113 MD(10814.00) Inc(91.5) Azm(180.8) TVD(6721.82)
VS(3986.55) NS(-3840.87) EW(1186.74) TEMP(178.9)

#114 MD(10910.00) Inc(92.3) Azm(180.6) TVD(6718.64)
VS(4080.90) NS(-3936.81) EW(1185.57) TEMP(178.9)

#115 MD(11005.00) Inc(90.3) Azm(180.3) TVD(6716.48)
VS(4174.36) NS(-4031.78) EW(1184.82) TEMP(178.9)

#116 MD(11101.00) Inc(90.9) Azm(179.9) TVD(6715.47)
VS(4268.93) NS(-4127.77) EW(1184.66) TEMP(178.9)

#117 MD(11197.00) Inc(90.9) Azm(180.6) TVD(6713.97)
VS(4363.46) NS(-4223.76) EW(1184.24) TEMP(178.9)

#118 MD(11292.00) Inc(91.8) Azm(180.1) TVD(6711.73)
VS(4456.95) NS(-4318.73) EW(1183.66) TEMP(178.9)

#119 MD(11387.00) Inc(90.2) Azm(179.7) TVD(6710.07)
VS(4550.58) NS(-4413.71) EW(1183.82) TEMP(193.7)

#120 MD(11483.00) Inc(91.3) Azm(178.5) TVD(6708.81)
VS(4645.43) NS(-4509.69) EW(1185.33) TEMP(193.7)

#121 MD(11579.00) Inc(89.8) Azm(179.9) TVD(6707.89)
VS(4740.24) NS(-4605.67) EW(1186.67) TEMP(193.7)

#122 MD(11674.00) Inc(90.2) Azm(180.1) TVD(6707.89)
VS(4833.86) NS(-4700.67) EW(1186.67) TEMP(193.7)

#123 MD(11769.00) Inc(90.9) Azm(179.7) TVD(6706.98)
VS(4927.51) NS(-4795.66) EW(1186.84) TEMP(193.7)

#124 MD(11865.00) Inc(90.3) Azm(180.1) TVD(6705.98)
VS(5022.14) NS(-4891.66) EW(1187.00) TEMP(193.7)

#125 MD(11961.00) Inc(90.5) Azm(180.1) TVD(6705.31)
VS(5116.72) NS(-4987.65) EW(1186.84) TEMP(193.7)

#126 MD(12056.00) Inc(91.4) Azm(179.6) TVD(6703.73)
VS(5210.37) NS(-5082.64) EW(1187.08) TEMP(193.7)

#127 MD(12152.00) Inc(89.3) Azm(180.8) TVD(6703.14)
VS(5304.91) NS(-5178.63) EW(1186.75) TEMP(193.7)

#128 MD(12248.00) Inc(89.6) Azm(180.6) TVD(6704.07)
VS(5399.30) NS(-5274.62) EW(1185.58) TEMP(193.7)

#129 MD(12343.00) Inc(90.2) Azm(179.9) TVD(6704.23)
VS(5492.85) NS(-5369.62) EW(1185.16) TEMP(193.7)

#130 MD(12438.00) Inc(90.6) Azm(179.7) TVD(6703.57)
VS(5586.53) NS(-5464.61) EW(1185.49) TEMP(193.7)

#131 MD(12534.00) Inc(91.2) Azm(179.2) TVD(6702.06)
VS(5681.28) NS(-5560.60) EW(1186.41) TEMP(193.7)

#132 MD(12630.00) Inc(89.4) Azm(178.2) TVD(6701.56)
VS(5776.22) NS(-5656.56) EW(1188.59) TEMP(193.7)

#133 MD(12726.00) Inc(90.0) Azm(178.5) TVD(6702.06)
VS(5871.26) NS(-5752.52) EW(1191.36) TEMP(193.7)

#134 MD(12821.00) Inc(90.8) Azm(178.2) TVD(6701.40)
VS(5965.30) NS(-5847.48) EW(1194.09) TEMP(193.7)

#135 MD(12917.00) Inc(91.5) Azm(178.2) TVD(6699.47)
VS(6060.36) NS(-5943.41) EW(1197.11) TEMP(193.7)

#136 MD(13013.00) Inc(89.8) Azm(177.8) TVD(6698.38)
VS(6155.47) NS(-6039.34) EW(1200.46) TEMP(193.7)

#137 MD(13109.00) Inc(90.3) Azm(177.8) TVD(6698.30)
VS(6250.63) NS(-6135.27) EW(1204.14) TEMP(193.7)

#138 MD(13203.00) Inc(90.2) Azm(179.2) TVD(6697.89)
VS(6343.65) NS(-6229.24) EW(1206.60) TEMP(193.7)

#139 MD(13299.00) Inc(90.9) Azm(179.4) TVD(6696.97)
VS(6438.44) NS(-6325.23) EW(1207.78) TEMP(193.7)

#140 MD(13395.00) Inc(89.9) Azm(179.4) TVD(6696.30)
VS(6533.21) NS(-6421.22) EW(1208.78) TEMP(193.7)

#141 MD(13490.00) Inc(90.3) Azm(179.2) TVD(6696.13)
VS(6627.02) NS(-6516.21) EW(1209.94) TEMP(193.7)

#142 MD(13587.00) Inc(91.2) Azm(179.0) TVD(6694.86)
VS(6722.85) NS(-6613.19) EW(1211.47) TEMP(193.7)

#143 MD(13682.00) Inc(90.0) Azm(179.2) TVD(6693.87)
VS(6816.71) NS(-6708.17) EW(1212.96) TEMP(193.7)

#144 MD(13865.00) Inc(91.0) Azm(178.3) TVD(6692.27)
VS(6997.68) NS(-6891.11) EW(1216.95) TEMP(208.5)