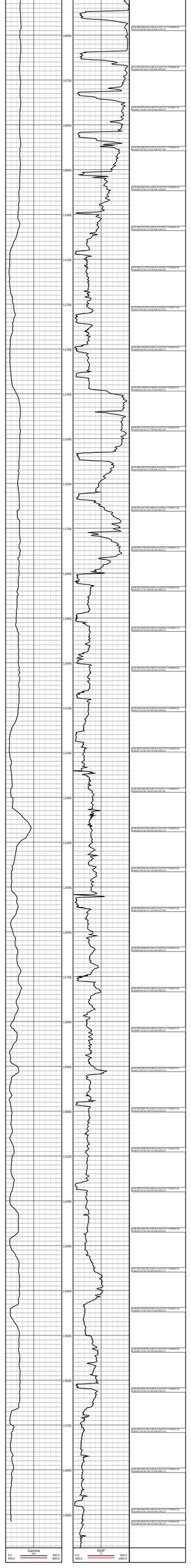

ENSIGN Directional

LDS 1W-414

MD
2":100'

Company: PDC Energy
Well Name: LDS 1W-414
API: 05123412050000
County/Parish: Weld
State: Colorado
Country: USA
Job number: 161-39
Field: Wattenberg
Rig Id: Ensign 161
Survey Company: Ensign Directional Services
DD1 Daniel Barton
DD2 Tony Callow
DD3 Richard Stahl
MWD1 Matt Brokaw
MWD2 Kabel Skelton

Log measurements: gamma, ROP
Depth measured from: Rig Floor ft
Maximum temperature:

	Depth	Date
Start:	1523 ft	2/3/2016
End:	ft	

Casing	Depth	Size
Surface:	1489 ft	9-5/8"
Intermediate:		

Mud Type: Water Based
Density:
Viscosity:
Rm: **Rmf:** **Rmc:**

Elevations
KB: 4636 ft
GL: 4613 ft
DF: 4636 ft

Run	Bit Size	Offsets Gamma	Offsets Survey	Depths Start	Depths End	Dates Start	Dates End
1	13.75"		52.81 ft	0 ft	1523 ft	2/2/2016	2/2/2016
2	8.75"	52.66 ft	47.66 ft	1523 ft	12240 ft	2/3/2016	2/8/2016
3	8.75"	59.42 ft	54.42 ft	12240 ft	12516 ft	2/8/16	2/9/16
4	8.75"	58.22 ft	53.22 ft	12516 ft		2/9/16	
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.

#16 MD(1587.00) Inc(1.1) Azm(256.5) TVD(1586.77)
VS(21.49) NS(-1.59) EW(-21.46)

#17 MD(1676.00) Inc(1.1) Azm(159.1) TVD(1675.76)
VS(22.04) NS(-2.59) EW(-21.98)

#18 MD(1766.00) Inc(2.6) Azm(145.3) TVD(1765.71)
VS(20.63) NS(-5.07) EW(-20.51)

#19 MD(1855.00) Inc(3.3) Azm(129.1) TVD(1854.60)
VS(17.57) NS(-8.35) EW(-17.37)

#20 MD(1945.00) Inc(4.3) Azm(122.8) TVD(1944.40)
VS(12.81) NS(-11.81) EW(-12.53)

#21 MD(2034.00) Inc(5.6) Azm(119.4) TVD(2033.06)
VS(6.32) NS(-15.75) EW(-5.94)

#22 MD(2124.00) Inc(6.8) Azm(116.1) TVD(2122.54)
VS(-2.18) NS(-20.25) EW(2.67)

#23 MD(2213.00) Inc(7.5) Azm(119.2) TVD(2210.84)
VS(-11.85) NS(-25.40) EW(12.47)

#24 MD(2303.00) Inc(6.9) Azm(115.7) TVD(2300.13)
VS(-21.72) NS(-30.61) EW(22.47)

#25 MD(2392.00) Inc(7.3) Azm(118.4) TVD(2388.45)
VS(-31.39) NS(-35.62) EW(32.26)

#26 MD(2481.00) Inc(6.9) Azm(117.0) TVD(2476.77)
VS(-41.00) NS(-40.73) EW(42.00)

#27 MD(2571.00) Inc(7.7) Azm(125.6) TVD(2566.04)
VS(-50.57) NS(-46.70) EW(51.72)

#28 MD(2660.00) Inc(7.9) Azm(123.3) TVD(2654.22)
VS(-60.36) NS(-53.53) EW(61.68)

#29 MD(2750.00) Inc(8.5) Azm(122.2) TVD(2743.30)
VS(-70.99) NS(-60.47) EW(72.48)

#30 MD(2839.00) Inc(8.4) Azm(121.7) TVD(2831.33)
VS(-81.92) NS(-67.39) EW(83.58)

#31 MD(2928.00) Inc(8.1) Azm(120.8) TVD(2919.41)
VS(-92.67) NS(-74.01) EW(94.49)

#32 MD(3018.00) Inc(7.5) Azm(120.1) TVD(3008.58)
VS(-103.04) NS(-80.21) EW(105.02)

#33 MD(3107.00) Inc(8.5) Azm(118.9) TVD(3096.71)
VS(-113.68) NS(-86.30) EW(115.80)

#34 MD(3197.00) Inc(7.7) Azm(119.1) TVD(3185.81)
VS(-124.62) NS(-92.45) EW(126.90)

#35 MD(3286.00) Inc(7.8) Azm(118.7) TVD(3274.00)
VS(-134.98) NS(-98.25) EW(137.40)

#36 MD(3375.00) Inc(8.2) Azm(116.6) TVD(3362.13)
VS(-145.81) NS(-103.99) EW(148.38)

#37 MD(3465.00) Inc(7.7) Azm(115.0) TVD(3451.27)
VS(-156.88) NS(-109.41) EW(159.58)

#38 MD(3554.00) Inc(7.7) Azm(112.4) TVD(3539.46)
VS(-167.68) NS(-114.20) EW(170.50)

#39 MD(3644.00) Inc(8.4) Azm(115.0) TVD(3628.58)
VS(-179.08) NS(-119.28) EW(182.03)

#40 MD(3733.00) Inc(9.1) Azm(116.3) TVD(3716.54)
VS(-191.14) NS(-125.14) EW(194.23)

#41 MD(3822.00) Inc(10.3) Azm(118.5) TVD(3804.27)
VS(-204.27) NS(-132.06) EW(207.53)

#42 MD(3912.00) Inc(10.5) Azm(118.9) TVD(3892.79)
VS(-218.32) NS(-139.86) EW(221.78)

#43 MD(4001.00) Inc(9.4) Azm(119.1) TVD(3980.45)
VS(-231.59) NS(-147.32) EW(235.23)

#44 MD(4091.00) Inc(8.8) Azm(118.9) TVD(4069.32)
VS(-243.87) NS(-154.22) EW(247.68)

#45 MD(4180.00) Inc(7.8) Azm(117.8) TVD(4157.38)
VS(-255.02) NS(-160.32) EW(258.98)

#46 MD(4269.00) Inc(6.8) Azm(111.2) TVD(4245.66)
VS(-265.16) NS(-165.05) EW(269.24)

#47 MD(4359.00) Inc(4.8) Azm(118.9) TVD(4335.20)
VS(-273.33) NS(-168.79) EW(277.50)

#48 MD(4448.00) Inc(3.3) Azm(116.1) TVD(4423.97)
VS(-278.82) NS(-171.72) EW(283.07)

#49 MD(4537.00) Inc(1.6) Azm(54.6) TVD(4512.90)
VS(-282.12) NS(-172.13) EW(286.38)

#50 MD(4626.00) Inc(2.8) Azm(39.8) TVD(4601.83)
VS(-284.58) NS(-169.74) EW(288.78)

#51 MD(4716.00) Inc(3.1) Azm(36.8) TVD(4691.71)
VS(-287.53) NS(-166.10) EW(291.65)

#52 MD(4805.00) Inc(0.7) Azm(128.6) TVD(4780.67)
VS(-289.44) NS(-164.51) EW(293.52)

#53 MD(4895.00) Inc(0.8) Azm(180.2) TVD(4870.66)
VS(-289.84) NS(-165.48) EW(293.94)

#54 MD(4984.00) Inc(0.7) Azm(191.3) TVD(4959.65)
VS(-289.71) NS(-166.64) EW(293.83)

#55 MD(5073.00) Inc(0.4) Azm(199.6) TVD(5048.65)
VS(-289.47) NS(-167.46) EW(293.62)

#56 MD(5163.00) Inc(0.4) Azm(215.9) TVD(5138.65)
VS(-289.17) NS(-168.01) EW(293.33)

#57 MD(5252.00) Inc(0.5) Azm(291.0) TVD(5227.65)
VS(-288.62) NS(-168.13) EW(292.79)

#58 MD(5341.00) Inc(0.7) Azm(317.2) TVD(5316.64)
VS(-287.91) NS(-167.59) EW(292.06)

#59 MD(5431.00) Inc(0.5) Azm(285.9) TVD(5406.64)
VS(-287.17) NS(-167.08) EW(291.31)

#60 MD(5520.00) Inc(0.9) Azm(256.7) TVD(5495.63)
VS(-286.11) NS(-167.13) EW(290.25)

#61 MD(5609.00) Inc(0.8) Azm(250.7) TVD(5584.62)
VS(-284.84) NS(-167.50) EW(288.99)

#62 MD(5699.00) Inc(0.3) Azm(294.3) TVD(5674.62)
VS(-284.03) NS(-167.61) EW(288.18)

#63 MD(5788.00) Inc(0.4) Azm(7.8) TVD(5763.62)
VS(-283.87) NS(-167.20) EW(288.01)

#64 MD(5878.00) Inc(0.6) Azm(2.9) TVD(5853.61)
VS(-283.95) NS(-166.42) EW(288.07)

#65 MD(5967.00) Inc(0.8) Azm(356.2) TVD(5942.61)
VS(-283.96) NS(-165.34) EW(288.06)

#66 MD(6057.00) Inc(0.8) Azm(4.5) TVD(6032.60)
VS(-284.00) NS(-164.08) EW(288.06)

#67 MD(6146.00) Inc(5.9) Azm(284.0) TVD(6121.43)
VS(-279.65) NS(-162.36) EW(283.67)

#68 MD(6235.00) Inc(17.9) Azm(287.1) TVD(6208.36)
VS(-262.20) NS(-157.21) EW(266.10)

#69 MD(6325.00) Inc(22.3) Azm(280.4) TVD(6292.87)
VS(-232.35) NS(-150.06) EW(236.06)

#70 MD(6414.00) Inc(26.6) Azm(269.4) TVD(6373.91)
VS(-195.86) NS(-147.21) EW(199.49)

#71 MD(6503.00) Inc(31.3) Azm(265.0) TVD(6451.78)
VS(-152.84) NS(-149.44) EW(156.51)

#72 MD(6592.00) Inc(34.7) Azm(264.4) TVD(6526.41)
VS(-104.49) NS(-153.93) EW(108.25)

#73 MD(6682.00) Inc(36.2) Azm(262.2) TVD(6599.73)
VS(-52.52) NS(-160.03) EW(56.42)

#74 MD(6771.00) Inc(40.5) Azm(262.3) TVD(6669.51)
VS(2.35) NS(-167.48) EW(1.72)

#75 MD(6860.00) Inc(49.3) Azm(265.5) TVD(6732.50)
VS(64.89) NS(-174.01) EW(-60.69)

#76 MD(6950.00) Inc(60.5) Azm(268.8) TVD(6784.17)
VS(138.37) NS(-177.52) EW(-134.10)

#77 MD(7039.00) Inc(66.5) Azm(271.5) TVD(6823.87)
VS(217.94) NS(-177.26) EW(-213.70)

#78 MD(7128.00) Inc(74.8) Azm(272.0) TVD(6853.34)
VS(301.71) NS(-174.69) EW(-297.56)

#79 MD(7218.00) Inc(78.3) Azm(271.5) TVD(6874.27)
VS(389.10) NS(-172.02) EW(-385.04)

#80 MD(7307.00) Inc(86.1) Azm(269.4) TVD(6886.34)
VS(477.16) NS(-171.34) EW(-473.14)

#81 MD(7397.00) Inc(89.0) Azm(268.8) TVD(6890.18)
VS(567.06) NS(-172.76) EW(-563.04)

#82 MD(7486.00) Inc(89.3) Azm(269.7) TVD(6891.50)
VS(656.05) NS(-173.92) EW(-652.02)

#83 MD(7575.00) Inc(90.9) Azm(269.7) TVD(6891.35)
VS(745.03) NS(-174.39) EW(-741.02)

#84 MD(7665.00) Inc(88.8) Azm(270.6) TVD(6891.58)
VS(834.99) NS(-174.15) EW(-831.01)

#85 MD(7757.00) Inc(89.3) Azm(272.0) TVD(6893.11)
VS(926.87) NS(-172.06) EW(-922.97)

#86 MD(7849.00) Inc(88.1) Azm(269.7) TVD(6895.20)
VS(1018.77) NS(-170.70) EW(-1014.93)

#87 MD(7942.00) Inc(90.0) Azm(269.7) TVD(6896.74)
VS(1111.74) NS(-171.19) EW(-1107.91)

#88 MD(8032.00) Inc(89.6) Azm(269.2) TVD(6897.05)
VS(1201.73) NS(-172.05) EW(-1197.91)

#89 MD(8125.00) Inc(91.2) Azm(267.8) TVD(6896.40)
VS(1294.72) NS(-174.48) EW(-1290.87)

#90 MD(8217.00) Inc(91.0) Azm(269.9) TVD(6894.64)
VS(1386.70) NS(-176.33) EW(-1382.83)

#91 MD(8310.00) Inc(89.8) Azm(269.9) TVD(6893.99)
VS(1479.67) NS(-176.49) EW(-1475.82)

#92 MD(8426.00) Inc(87.4) Azm(266.9) TVD(6896.82)
VS(1595.61) NS(-179.73) EW(-1591.72)

#93 MD(8518.00) Inc(89.4) Azm(266.5) TVD(6899.39)
VS(1687.52) NS(-185.02) EW(-1683.53)

#94 MD(8610.00) Inc(88.5) Azm(268.3) TVD(6901.08)
VS(1779.48) NS(-189.19) EW(-1775.41)

#95 MD(8702.00) Inc(90.7) Azm(268.0) TVD(6901.72)
VS(1871.47) NS(-192.16) EW(-1867.36)

#96 MD(8794.00) Inc(91.5) Azm(268.7) TVD(6899.95)
VS(1963.45) NS(-194.81) EW(-1959.30)

#97 MD(8887.00) Inc(90.3) Azm(269.4) TVD(6898.49)
VS(2056.43) NS(-196.35) EW(-2052.27)

#98 MD(8976.00) Inc(91.9) Azm(269.5) TVD(6896.78)
VS(2145.40) NS(-197.21) EW(-2141.25)

#99 MD(9065.00) Inc(91.3) Azm(270.6) TVD(6894.30)
VS(2234.34) NS(-197.13) EW(-2230.21)

#100 MD(9155.00) Inc(90.0) Azm(271.8) TVD(6893.28)
VS(2324.24) NS(-195.25) EW(-2320.18)

#101 MD(9245.00) Inc(90.0) Azm(271.3) TVD(6893.28)
VS(2414.12) NS(-192.81) EW(-2410.15)

#102 MD(9334.00) Inc(89.2) Azm(272.9) TVD(6893.90)
VS(2502.95) NS(-189.55) EW(-2499.08)

#103 MD(9423.00) Inc(90.7) Azm(272.2) TVD(6893.98)
VS(2591.73) NS(-185.59) EW(-2587.99)

#104 MD(9512.00) Inc(87.7) Azm(270.9) TVD(6895.22)
VS(2680.60) NS(-183.18) EW(-2676.94)

#105 MD(9602.00) Inc(88.4) Azm(269.7) TVD(6898.28)
VS(2770.50) NS(-182.71) EW(-2766.88)

#106 MD(9691.00) Inc(90.7) Azm(270.2) TVD(6898.98)
VS(2859.47) NS(-182.79) EW(-2855.88)

#107 MD(9781.00) Inc(91.1) Azm(270.4) TVD(6897.57)
VS(2949.42) NS(-182.32) EW(-2945.86)

#108 MD(9870.00) Inc(91.2) Azm(270.1) TVD(6895.78)
VS(3038.36) NS(-181.93) EW(-3034.84)

#109 MD(9959.00) Inc(90.6) Azm(270.1) TVD(6894.38)
VS(3127.32) NS(-181.78) EW(-3123.83)

#110 MD(10049.00) Inc(89.3) Azm(269.7) TVD(6894.46)
VS(3217.30) NS(-181.93) EW(-3213.83)

#111 MD(10138.00) Inc(90.7) Azm(268.3) TVD(6894.46)
VS(3306.29) NS(-183.49) EW(-3302.81)

#112 MD(10227.00) Inc(91.1) Azm(270.1) TVD(6893.06)
VS(3395.27) NS(-184.73) EW(-3391.79)

#113 MD(10317.00) Inc(91.0) Azm(270.8) TVD(6891.41)
VS(3485.21) NS(-184.02) EW(-3481.77)

#114 MD(10406.00) Inc(90.3) Azm(270.4) TVD(6890.41)
VS(3574.15) NS(-183.09) EW(-3570.76)

#115 MD(10495.00) Inc(90.5) Azm(270.9) TVD(6889.78)
VS(3663.09) NS(-182.08) EW(-3659.75)

#116 MD(10585.00) Inc(90.5) Azm(271.5) TVD(6889.00)
VS(3753.00) NS(-180.20) EW(-3749.73)

#117 MD(10674.00) Inc(90.4) Azm(271.8) TVD(6888.30)
VS(3841.87) NS(-177.63) EW(-3838.69)

#118 MD(10764.00) Inc(90.7) Azm(270.1) TVD(6887.44)
VS(3931.78) NS(-176.14) EW(-3928.67)

#119 MD(10853.00) Inc(90.5) Azm(270.2) TVD(6886.50)
VS(4020.75) NS(-175.91) EW(-4017.66)

#120 MD(10942.00) Inc(90.9) Azm(270.6) TVD(6885.42)
VS(4109.70) NS(-175.29) EW(-4106.65)

#121 MD(11031.00) Inc(92.0) Azm(269.4) TVD(6883.16)
VS(4198.64) NS(-175.29) EW(-4195.62)

#122 MD(11121.00) Inc(90.9) Azm(268.7) TVD(6880.89)
VS(4288.61) NS(-176.78) EW(-4285.58)

#123 MD(11210.00) Inc(92.9) Azm(269.4) TVD(6877.94)
VS(4377.55) NS(-178.25) EW(-4374.51)

#124 MD(11299.00) Inc(90.1) Azm(270.4) TVD(6875.61)
VS(4466.49) NS(-178.41) EW(-4463.47)

#125 MD(11389.00) Inc(88.8) Azm(269.9) TVD(6876.47)
VS(4556.45) NS(-178.17) EW(-4553.47)

#126 MD(11478.00) Inc(91.1) Azm(270.6) TVD(6876.55)
VS(4645.40) NS(-177.78) EW(-4642.46)

#127 MD(11567.00) Inc(89.9) Azm(269.0) TVD(6875.77)
VS(4734.38) NS(-178.09) EW(-4731.45)

#128 MD(11657.00) Inc(88.2) Azm(268.1) TVD(6877.26)
VS(4824.36) NS(-180.37) EW(-4821.40)

#129 MD(11746.00) Inc(89.9) Azm(267.1) TVD(6878.74)
VS(4913.33) NS(-184.10) EW(-4910.31)

#130 MD(11835.00) Inc(89.0) Azm(267.8) TVD(6879.59)
VS(5002.31) NS(-188.06) EW(-4999.22)

#131 MD(11925.00) Inc(87.8) Azm(268.1) TVD(6882.11)
VS(5092.26) NS(-191.28) EW(-5089.12)

#132 MD(12014.00) Inc(88.7) Azm(269.0) TVD(6884.82)
VS(5181.22) NS(-193.53) EW(-5178.05)

#133 MD(12104.00) Inc(89.8) Azm(269.2) TVD(6886.00)
VS(5271.21) NS(-194.94) EW(-5268.03)

#134 MD(12194.00) Inc(90.6) Azm(272.3) TVD(6885.69)
VS(5361.13) NS(-193.76) EW(-5358.01)

#135 MD(12284.00) Inc(92.1) Azm(272.7) TVD(6883.57)
VS(5450.90) NS(-189.84) EW(-5447.90)

#136 MD(12372.00) Inc(92.5) Azm(272.5) TVD(6880.04)
VS(5538.61) NS(-185.85) EW(-5535.73)

#137 MD(12461.00) Inc(92.9) Azm(273.6) TVD(6875.84)
VS(5627.25) NS(-181.12) EW(-5624.51)

#138 MD(12550.00) Inc(90.4) Azm(271.3) TVD(6873.28)
VS(5716.00) NS(-177.32) EW(-5713.38)

#139 MD(12639.00) Inc(91.2) Azm(270.9) TVD(6872.04)
VS(5804.90) NS(-175.61) EW(-5802.35)

#140 MD(12729.00) Inc(89.1) Azm(270.4) TVD(6871.80)
VS(5894.84) NS(-174.59) EW(-5892.34)

#141 MD(12818.00) Inc(89.4) Azm(271.1) TVD(6872.97)
VS(5983.77) NS(-173.42) EW(-5981.32)

#142 MD(12907.00) Inc(89.7) Azm(270.9) TVD(6873.67)
VS(6072.69) NS(-171.87) EW(-6070.31)

#143 MD(12997.00) Inc(90.7) Azm(271.6) TVD(6873.35)
VS(6162.59) NS(-169.91) EW(-6160.28)

#144 MD(13086.00) Inc(91.3) Azm(272.0) TVD(6871.80)
VS(6251.44) NS(-167.11) EW(-6249.23)

#145 MD(13175.00) Inc(90.5) Azm(270.6) TVD(6870.40)
VS(6340.33) NS(-165.09) EW(-6338.19)

#146 MD(13265.00) Inc(90.8) Azm(270.4) TVD(6869.38)
VS(6430.27) NS(-164.31) EW(-6428.18)

#147 MD(13354.00) Inc(90.7) Azm(270.4) TVD(6868.22)
VS(6519.22) NS(-163.69) EW(-6517.17)

#148 MD(13443.00) Inc(90.7) Azm(270.4) TVD(6867.13)
VS(6608.17) NS(-163.07) EW(-6606.16)

#149 MD(13533.00) Inc(90.7) Azm(270.6) TVD(6866.03)
VS(6698.12) NS(-162.28) EW(-6696.15)

#150 MD(13622.00) Inc(90.0) Azm(270.2) TVD(6865.48)
VS(6787.07) NS(-161.66) EW(-6785.15)

#151 MD(13712.00) Inc(90.3) Azm(270.2) TVD(6865.25)
VS(6877.04) NS(-161.34) EW(-6875.14)

#152 MD(13801.00) Inc(90.8) Azm(270.6) TVD(6864.39)
VS(6965.99) NS(-160.72) EW(-6964.14)

#153 MD(13891.00) Inc(89.0) Azm(270.9) TVD(6864.55)
VS(7055.92) NS(-159.54) EW(-7054.13)

#154 MD(13918.00) Inc(89.3) Azm(270.9) TVD(6864.95)
VS(7082.90) NS(-159.12) EW(-7081.12)