ENSIGN Directional Services

Todd LC25-750

MD 2":100'

Company: Noble Energy
Well Name: Todd LC25-750
API: 05-123-40676-00
Rig Id: H&P 326
State: Colorado
County/Parish: Weld
Country: USA
Survey Company: ENSIGN Directional
Job number: HP326-207-11
DD1 Zach Gentry
DD2 Tyler Bachelder
DD3 Colby Hansen
MWD1 Andrew Demrow
MWD2 Derek Saykally
MWD3 Buster Snider

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

	Depth	Date
Start:	1411 ft	05-11-2015
End:	10865 ft	05-16-2015

Casing	Depth	Size
Surface:	1408	9 5/8
Intermediate:	6572	7

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

Elevations
KB: 30
GL: 4827
DF: 4857

Run	Bit Size	Offsets Gamma	Offsets Survey	Depths Start	Depths End	Dates Start	Dates End
1	8.75	54.22	49.22	1411	6582	05-11-2015	05-13-2015
2	6.125	64.98	59.98	6582	10865	05-14-2015	05-16-2015
3							
4							
5							
6							
7							
8							
9							
10							

ENSIGN Directional 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.

#6 MD(600.00) Inc(1.4) Azm(247.4) TVD(599.95)
VS(-3.74) NS(-3.27) EW(-5.54)

#7 MD(700.00) Inc(1.9) Azm(258.7) TVD(699.91)
VS(-4.77) NS(-4.06) EW(-8.30)

#8 MD(800.00) Inc(2.5) Azm(259.5) TVD(799.84)
VS(-5.80) NS(-4.77) EW(-12.01)

#9 MD(900.00) Inc(2.7) Azm(263.9) TVD(899.74)
VS(-6.83) NS(-5.42) EW(-16.48)

#10 MD(1000.00) Inc(3.2) Azm(269.4) TVD(999.61)
VS(-7.56) NS(-5.70) EW(-21.61)

#11 MD(1100.00) Inc(3.4) Azm(273.7) TVD(1099.44)
VS(-7.90) NS(-5.53) EW(-27.37)

#12 MD(1200.00) Inc(3.5) Azm(282.0) TVD(1199.26)
VS(-7.59) NS(-4.70) EW(-33.34)

#13 MD(1300.00) Inc(2.9) Azm(284.4) TVD(1299.10)
VS(-6.80) NS(-3.44) EW(-38.79)

#14 MD(1357.00) Inc(2.8) Azm(289.2) TVD(1356.03)
VS(-6.23) NS(-2.62) EW(-41.51)

#15 MD(1583.00) Inc(1.7) Azm(296.8) TVD(1581.86)
VS(-3.66) NS(0.67) EW(-49.63)

#16 MD(1676.00) Inc(1.2) Azm(294.3) TVD(1674.83)
VS(-2.83) NS(1.68) EW(-51.72)

#17 MD(1768.00) Inc(0.9) Azm(292.8) TVD(1766.81)
VS(-2.29) NS(2.36) EW(-53.27)

#18 MD(1860.00) Inc(2.4) Azm(3.5) TVD(1858.78)
VS(-0.13) NS(4.58) EW(-53.83)

#19 MD(1952.00) Inc(2.7) Azm(48.1) TVD(1950.69)
VS(3.39) NS(7.96) EW(-52.11)

#20 MD(2045.00) Inc(3.7) Azm(77.4) TVD(2043.55)
VS(5.89) NS(10.07) EW(-47.53)

#21 MD(2137.00) Inc(4.0) Azm(102.6) TVD(2135.35)
VS(6.38) NS(10.04) EW(-41.51)

#22 MD(2230.00) Inc(5.3) Azm(118.0) TVD(2228.05)
VS(4.29) NS(7.34) EW(-34.61)

#23 MD(2322.00) Inc(7.7) Azm(118.3) TVD(2319.46)
VS(0.20) NS(2.43) EW(-25.46)

#24 MD(2413.00) Inc(9.4) Azm(124.8) TVD(2409.45)
VS(-5.91) NS(-4.70) EW(-14.00)

#25 MD(2506.00) Inc(11.1) Azm(132.0) TVD(2500.96)
VS(-15.07) NS(-15.03) EW(-1.11)

#26 MD(2600.00) Inc(13.0) Azm(136.3) TVD(2592.89)
VS(-27.50) NS(-28.73) EW(12.93)

#27 MD(2692.00) Inc(14.6) Azm(132.3) TVD(2682.22)
VS(-41.38) NS(-44.05) EW(28.68)

#28 MD(2785.00) Inc(14.6) Azm(129.8) TVD(2772.21)
VS(-55.18) NS(-59.45) EW(46.38)

#29 MD(2877.00) Inc(16.0) Azm(126.9) TVD(2860.95)
VS(-68.48) NS(-74.47) EW(65.43)

#30 MD(2972.00) Inc(15.4) Azm(124.2) TVD(2952.40)
VS(-81.56) NS(-89.43) EW(86.36)

#31 MD(3067.00) Inc(14.7) Azm(122.4) TVD(3044.13)
VS(-93.28) NS(-103.00) EW(107.00)

#32 MD(3162.00) Inc(15.6) Azm(122.8) TVD(3135.83)
VS(-104.79) NS(-116.38) EW(127.93)

#33 MD(3256.00) Inc(16.0) Azm(126.9) TVD(3226.27)
VS(-117.55) NS(-131.03) EW(148.94)

#34 MD(3350.00) Inc(15.7) Azm(128.7) TVD(3316.69)
VS(-131.47) NS(-146.78) EW(169.24)

#35 MD(3445.00) Inc(15.7) Azm(127.8) TVD(3408.15)
VS(-145.56) NS(-162.69) EW(189.42)

#36 MD(3539.00) Inc(16.0) Azm(127.4) TVD(3498.58)
VS(-159.39) NS(-178.35) EW(209.75)

#37 MD(3634.00) Inc(16.1) Azm(126.9) TVD(3589.87)
VS(-173.36) NS(-194.20) EW(230.68)

#38 MD(3728.00) Inc(16.3) Azm(126.6) TVD(3680.15)
VS(-187.14) NS(-209.88) EW(251.67)

#39 MD(3823.00) Inc(16.2) Azm(125.4) TVD(3771.36)
VS(-200.81) NS(-225.48) EW(273.17)

#40 MD(4012.00) Inc(15.1) Azm(124.0) TVD(3953.36)
VS(-226.07) NS(-254.50) EW(315.07)

#41 MD(4107.00) Inc(13.8) Azm(125.5) TVD(4045.35)
VS(-237.81) NS(-267.99) EW(334.56)

#42 MD(4201.00) Inc(14.1) Azm(130.9) TVD(4136.57)
VS(-250.23) NS(-282.01) EW(352.37)

#43 MD(4296.00) Inc(15.2) Azm(129.8) TVD(4228.49)
VS(-264.12) NS(-297.56) EW(370.66)

#44 MD(4391.00) Inc(13.8) Azm(128.0) TVD(4320.47)
VS(-277.39) NS(-312.49) EW(389.13)

#45 MD(4486.00) Inc(14.9) Azm(131.7) TVD(4412.51)
VS(-290.86) NS(-327.59) EW(407.17)

#46 MD(4580.00) Inc(13.4) Azm(130.0) TVD(4503.65)
VS(-304.34) NS(-342.64) EW(424.55)

#47 MD(4675.00) Inc(11.8) Azm(126.8) TVD(4596.36)
VS(-315.77) NS(-355.53) EW(440.75)

#48 MD(4770.00) Inc(11.1) Azm(123.2) TVD(4689.48)
VS(-325.18) NS(-366.33) EW(456.16)

#49 MD(4864.00) Inc(8.5) Azm(128.9) TVD(4782.11)
VS(-333.31) NS(-375.63) EW(469.12)

#50 MD(4959.00) Inc(7.3) Azm(139.6) TVD(4876.21)
VS(-341.48) NS(-384.65) EW(478.51)

#51 MD(5053.00) Inc(6.3) Azm(134.0) TVD(4969.54)
VS(-348.93) NS(-392.80) EW(486.10)

#52 MD(5148.00) Inc(5.6) Azm(130.3) TVD(5064.03)
VS(-354.88) NS(-399.40) EW(493.37)

#53 MD(5242.00) Inc(4.8) Azm(127.8) TVD(5157.64)
VS(-359.67) NS(-404.78) EW(499.99)

#54 MD(5337.00) Inc(2.5) Azm(134.3) TVD(5252.44)
VS(-363.16) NS(-408.70) EW(504.64)

#55 MD(5432.00) Inc(0.8) Azm(127.1) TVD(5347.40)
VS(-364.81) NS(-410.52) EW(506.63)

#56 MD(5527.00) Inc(0.1) Azm(98.0) TVD(5442.40)
VS(-365.14) NS(-410.91) EW(507.20)

#57 MD(5621.00) Inc(8.8) Azm(7.0) TVD(5536.03)
VS(-357.95) NS(-403.78) EW(508.14)

#58 MD(5715.00) Inc(14.1) Azm(0.8) TVD(5628.14)
VS(-339.37) NS(-385.21) EW(509.18)

#59 MD(5810.00) Inc(18.2) Azm(3.9) TVD(5719.38)
VS(-313.00) NS(-358.85) EW(510.36)

#60 MD(5905.00) Inc(25.6) Azm(0.3) TVD(5807.47)
VS(-277.68) NS(-323.49) EW(511.48)

#61 MD(5999.00) Inc(34.0) Azm(0.7) TVD(5888.98)
VS(-231.18) NS(-276.85) EW(511.92)

#62 MD(6094.00) Inc(43.9) Azm(1.6) TVD(5962.78)
VS(-171.67) NS(-217.22) EW(513.20)

#63 MD(6188.00) Inc(51.6) Azm(359.3) TVD(6025.91)
VS(-102.34) NS(-147.68) EW(513.69)

#64 MD(6283.00) Inc(63.0) Azm(1.3) TVD(6077.10)
VS(-22.77) NS(-67.84) EW(514.20)

#65 MD(6377.00) Inc(73.4) Azm(358.6) TVD(6111.97)
VS(64.03) NS(19.31) EW(514.05)

#66 MD(6472.00) Inc(82.5) Azm(357.8) TVD(6131.81)
VS(156.18) NS(112.06) EW(511.10)

#67 MD(6532.00) Inc(84.8) Azm(354.9) TVD(6138.42)
VS(215.12) NS(171.56) EW(507.25)

#68 MD(6635.00) Inc(89.0) Azm(357.1) TVD(6143.98)
VS(316.66) NS(274.13) EW(499.99)

#69 MD(6727.00) Inc(91.5) Azm(357.8) TVD(6143.59)
VS(407.85) NS(366.02) EW(495.89)

#70 MD(6820.00) Inc(91.8) Azm(358.2) TVD(6140.91)
VS(500.12) NS(458.93) EW(492.67)

#71 MD(6912.00) Inc(90.4) Azm(357.4) TVD(6139.14)
VS(591.38) NS(550.84) EW(489.13)

#72 MD(7007.00) Inc(91.4) Azm(357.9) TVD(6137.64)
VS(685.59) NS(645.75) EW(485.26)

#73 MD(7196.00) Inc(89.5) Azm(357.5) TVD(6136.26)
VS(873.04) NS(834.58) EW(477.71)

#74 MD(7290.00) Inc(88.7) Azm(356.5) TVD(6137.81)
VS(966.12) NS(928.44) EW(472.80)

#75 MD(7384.00) Inc(89.5) Azm(358.1) TVD(6139.36)
VS(1059.25) NS(1022.32) EW(468.39)

#76 MD(7479.00) Inc(89.8) Azm(357.9) TVD(6139.94)
VS(1153.55) NS(1117.26) EW(465.10)

#77 MD(7573.00) Inc(89.7) Azm(357.2) TVD(6140.30)
VS(1246.76) NS(1211.18) EW(461.12)

#78 MD(7667.00) Inc(91.0) Azm(358.6) TVD(6139.73)
VS(1340.04) NS(1305.11) EW(457.72)

#79 MD(7762.00) Inc(90.9) Azm(358.2) TVD(6138.18)
VS(1434.39) NS(1400.06) EW(455.08)

#80 MD(7857.00) Inc(90.2) Azm(357.3) TVD(6137.30)
VS(1528.63) NS(1494.98) EW(451.34)

#81 MD(7951.00) Inc(91.4) Azm(357.7) TVD(6136.05)
VS(1621.81) NS(1588.88) EW(447.21)

#82 MD(8045.00) Inc(92.1) Azm(359.0) TVD(6133.21)
VS(1715.13) NS(1682.79) EW(444.45)

#83 MD(8140.00) Inc(91.6) Azm(358.5) TVD(6130.13)
VS(1809.51) NS(1777.72) EW(442.39)

#84 MD(8235.00) Inc(91.6) Azm(358.2) TVD(6127.48)
VS(1903.84) NS(1872.64) EW(439.68)

#85 MD(8329.00) Inc(91.3) Azm(356.6) TVD(6125.13)
VS(1996.98) NS(1966.52) EW(435.42)

#86 MD(8423.00) Inc(93.5) Azm(358.4) TVD(6121.20)
VS(2090.08) NS(2060.33) EW(431.30)

#87 MD(8611.00) Inc(92.0) Azm(359.8) TVD(6112.26)
VS(2276.86) NS(2248.09) EW(428.26)

#88 MD(8706.00) Inc(92.7) Azm(359.4) TVD(6108.43)
VS(2371.36) NS(2343.01) EW(427.59)

#89 MD(8800.00) Inc(90.3) Azm(359.5) TVD(6105.98)
VS(2464.88) NS(2436.96) EW(426.71)

#90 MD(8895.00) Inc(88.5) Azm(358.6) TVD(6106.93)
VS(2559.36) NS(2531.94) EW(425.17)

#91 MD(8990.00) Inc(87.7) Azm(358.1) TVD(6110.02)
VS(2653.67) NS(2626.85) EW(422.46)

#92 MD(9084.00) Inc(88.4) Azm(359.7) TVD(6113.18)
VS(2747.08) NS(2720.78) EW(420.64)

#93 MD(9179.00) Inc(90.6) Azm(359.1) TVD(6114.02)
VS(2841.62) NS(2815.76) EW(419.60)

#94 MD(9273.00) Inc(90.1) Azm(357.9) TVD(6113.45)
VS(2935.01) NS(2909.73) EW(417.14)

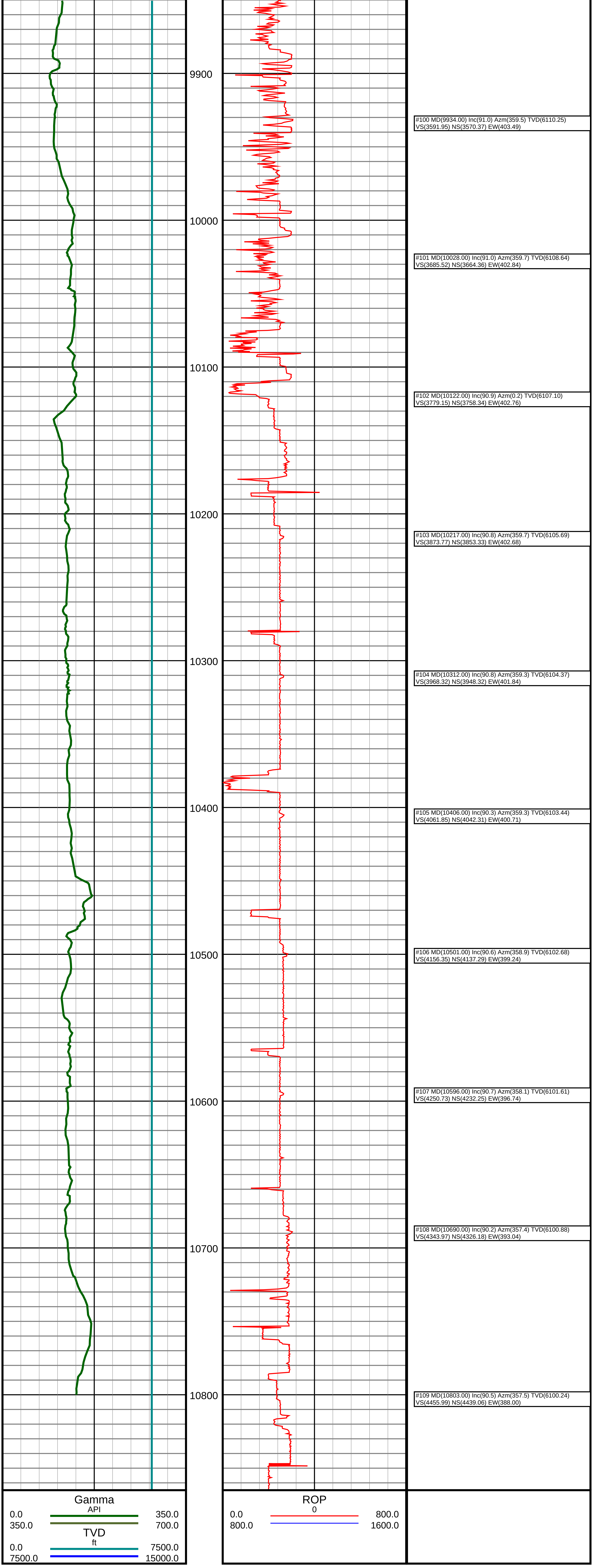
#95 MD(9368.00) Inc(89.1) Azm(356.6) TVD(6114.07)
VS(3029.14) NS(3004.61) EW(412.62)

#96 MD(9462.00) Inc(90.2) Azm(357.5) TVD(6114.58)
VS(3122.23) NS(3098.48) EW(407.77)

#97 MD(9556.00) Inc(90.1) Azm(358.3) TVD(6114.29)
VS(3215.51) NS(3192.42) EW(404.29)

#98 MD(9651.00) Inc(90.9) Azm(0.9) TVD(6113.45)
VS(3310.07) NS(3287.40) EW(403.61)

#99 MD(9840.00) Inc(90.4) Azm(359.5) TVD(6111.36)
VS(3498.39) NS(3476.38) EW(404.30)



#100 MD(9934.00) Inc(91.0) Azm(359.5) TVD(6110.25)
VS(3591.95) NS(3570.37) EW(403.49)

#101 MD(10028.00) Inc(91.0) Azm(359.7) TVD(6108.64)
VS(3685.52) NS(3664.36) EW(402.84)

#102 MD(10122.00) Inc(90.9) Azm(0.2) TVD(6107.10)
VS(3779.15) NS(3758.34) EW(402.76)

#103 MD(10217.00) Inc(90.8) Azm(359.7) TVD(6105.69)
VS(3873.77) NS(3853.33) EW(402.68)

#104 MD(10312.00) Inc(90.8) Azm(359.3) TVD(6104.37)
VS(3968.32) NS(3948.32) EW(401.84)

#105 MD(10406.00) Inc(90.3) Azm(359.3) TVD(6103.44)
VS(4061.85) NS(4042.31) EW(400.71)

#106 MD(10501.00) Inc(90.6) Azm(358.9) TVD(6102.68)
VS(4156.35) NS(4137.29) EW(399.24)

#107 MD(10596.00) Inc(90.7) Azm(358.1) TVD(6101.61)
VS(4250.73) NS(4232.25) EW(396.74)

#108 MD(10690.00) Inc(90.2) Azm(357.4) TVD(6100.88)
VS(4343.97) NS(4326.18) EW(393.04)

#109 MD(10803.00) Inc(90.5) Azm(357.5) TVD(6100.24)
VS(4455.99) NS(4439.06) EW(388.00)