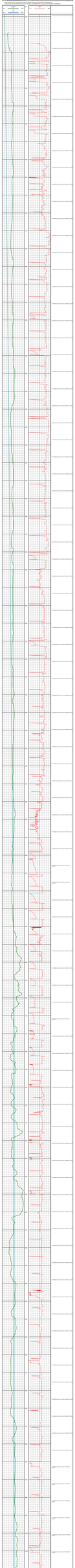

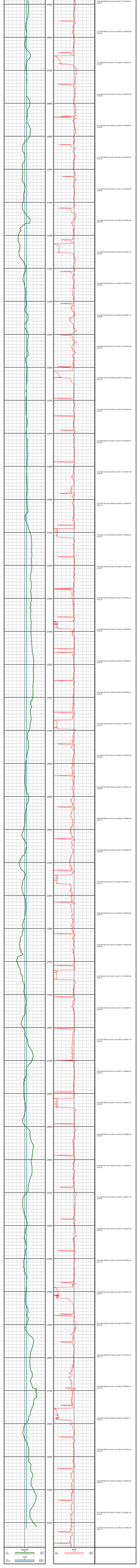

# Fern 11V-334

**MD**
**2":100'**

**Company:** PDC Energy Inc
**Well Name:** Fern 11V-334
**API:** 05123458400
**County/Parish:** WELD
**State:** COLORADO
**Country:** USA
**Job number:** 152-130
**Field:** Wattenberg
**Rig Id:** Ensign 152
**Survey Company:** Ensign Directional
**DD1** Jesus Gallego
**DD2** Dan Hanson
**DD3** Joe Edgerton
**MWD1** Justin Klatt
**MWD2** Chad Anderson
**MWD3**

**Log measurements:** Gamma, ROP
**Depth measured from:** 1638 ft
**Maximum temperature:**

| | Depth | Date |
|---|---|---|
| **Start:** | 0 ft | 3-18-2018 |
| **End:** | 15,175 ft | 3-21-2018 |

| **Casing** | **Depth** | **Size** |
|---|---|---|
| **Surface:** | 1638 ft | 9 5/8" |
| **Intermediate:** | | |

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

**Elevations**
**KB:** 23 ft
**GL:** 4619 ft
**DF:** 4642 ft

| Run | Bit Size | Offsets | | Depths | | Dates | |
|---|---|---|---|---|---|---|---|
| | | Gamma | Survey | Start | End | Start | End |
| 1 | 12.25" | | 58.74 ft | 0 ft | 1650 ft | 3-18-2018 | 3-18-2018 |
| 2 | 8.5" | 62.55 ft | 57.72 ft | 1650 ft | 15,175 ft | 3-19-2018 | 3-21-2018 |
| 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.

#15 MD(1487.00) Inc(9.1) Azm(181.4) TVD(1482.62) DLS(1.0)

#16 MD(1590.00) Inc(7.7) Azm(176.3) TVD(1584.52) DLS(1.5)

#17 MD(1678.00) Inc(7.2) Azm(174.0) TVD(1671.78) DLS(0.7)

#18 MD(1774.00) Inc(7.7) Azm(172.1) TVD(1766.97) DLS(0.6)

#19 MD(1869.00) Inc(8.3) Azm(183.1) TVD(1861.05) DLS(1.7)

#20 MD(1964.00) Inc(11.1) Azm(178.4) TVD(1954.68) DLS(3.1)

#21 MD(2060.00) Inc(12.6) Azm(176.5) TVD(2048.63) DLS(1.6)

#22 MD(2155.00) Inc(14.9) Azm(175.2) TVD(2140.90) DLS(2.4)

#23 MD(2251.00) Inc(14.7) Azm(175.8) TVD(2233.72) DLS(0.3)

#24 MD(2346.00) Inc(14.2) Azm(176.5) TVD(2325.71) DLS(0.6)

#25 MD(2441.00) Inc(13.9) Azm(177.0) TVD(2417.87) DLS(0.3)

#26 MD(2536.00) Inc(13.7) Azm(174.7) TVD(2510.13) DLS(0.6)

#27 MD(2632.00) Inc(13.5) Azm(174.7) TVD(2603.44) DLS(0.2)

#28 MD(2727.00) Inc(13.3) Azm(174.3) TVD(2695.85) DLS(0.2)

#29 MD(2822.00) Inc(13.2) Azm(174.3) TVD(2788.32) DLS(0.1)

#30 MD(2917.00) Inc(12.5) Azm(172.1) TVD(2880.94) DLS(0.9)

#31 MD(3014.00) Inc(12.4) Azm(171.9) TVD(2975.66) DLS(0.1)

#32 MD(3109.00) Inc(12.0) Azm(170.1) TVD(3068.52) DLS(0.6)

#33 MD(3204.00) Inc(12.9) Azm(172.1) TVD(3161.28) DLS(1.1)

#34 MD(3300.00) Inc(12.5) Azm(170.0) TVD(3254.93) DLS(0.6)

#35 MD(3395.00) Inc(16.2) Azm(179.4) TVD(3346.97) DLS(4.6)

#36 MD(3490.00) Inc(15.8) Azm(179.1) TVD(3438.29) DLS(0.4)

#37 MD(3586.00) Inc(14.9) Azm(179.1) TVD(3530.86) DLS(0.9)

#38 MD(3681.00) Inc(14.7) Azm(176.8) TVD(3622.71) DLS(0.7)

#39 MD(3777.00) Inc(14.6) Azm(176.3) TVD(3715.59) DLS(0.2)

#40 MD(3872.00) Inc(14.5) Azm(176.5) TVD(3807.54) DLS(0.1)

#41 MD(3968.00) Inc(14.3) Azm(177.0) TVD(3900.53) DLS(0.2)

#42 MD(4063.00) Inc(13.8) Azm(176.1) TVD(3992.68) DLS(0.6)

#43 MD(4158.00) Inc(13.2) Azm(175.8) TVD(4085.06) DLS(0.6)

#44 MD(4254.00) Inc(12.8) Azm(174.9) TVD(4178.60) DLS(0.5)

#45 MD(4349.00) Inc(12.1) Azm(173.6) TVD(4271.36) DLS(0.8)

#46 MD(4445.00) Inc(11.6) Azm(173.5) TVD(4365.32) DLS(0.5)

#47 MD(4541.00) Inc(13.7) Azm(180.8) TVD(4458.99) DLS(2.7)

#48 MD(4636.00) Inc(13.0) Azm(181.0) TVD(4551.42) DLS(0.7)

#49 MD(4732.00) Inc(12.4) Azm(179.4) TVD(4645.07) DLS(0.7)

#50 MD(4828.00) Inc(12.0) Azm(178.9) TVD(4738.90) DLS(0.4)

#51 MD(4924.00) Inc(11.3) Azm(177.9) TVD(4832.92) DLS(0.8)

#52 MD(5019.00) Inc(14.7) Azm(181.6) TVD(4925.48) DLS(3.7)

#53 MD(5114.00) Inc(14.5) Azm(181.0) TVD(5017.41) DLS(0.3)

#54 MD(5210.00) Inc(13.8) Azm(179.3) TVD(5110.50) DLS(0.8)

#55 MD(5306.00) Inc(12.7) Azm(177.5) TVD(5203.94) DLS(1.2)

#56 MD(5401.00) Inc(11.8) Azm(175.0) TVD(5296.78) DLS(1.1)

#57 MD(5496.00) Inc(11.2) Azm(174.2) TVD(5389.87) DLS(0.7)

#58 MD(5592.00) Inc(10.3) Azm(170.5) TVD(5484.19) DLS(1.2)

#59 MD(5688.00) Inc(9.8) Azm(168.5) TVD(5578.71) DLS(0.6)

#60 MD(5784.00) Inc(8.8) Azm(167.7) TVD(5673.45) DLS(1.1)

#61 MD(5878.00) Inc(8.2) Azm(165.9) TVD(5766.42) DLS(0.7)

#62 MD(5974.00) Inc(7.7) Azm(163.6) TVD(5861.49) DLS(0.6)

#63 MD(6069.00) Inc(6.8) Azm(162.2) TVD(5955.73) DLS(1.0)

#64 MD(6164.00) Inc(6.1) Azm(159.6) TVD(6050.13) DLS(0.8)

#65 MD(6260.00) Inc(14.0) Azm(198.1) TVD(6144.67) DLS(10.4)

#66 MD(6355.00) Inc(23.7) Azm(220.4) TVD(6234.58) DLS(12.5)

#67 MD(6451.00) Inc(28.6) Azm(235.3) TVD(6320.82) DLS(8.5)

#68 MD(6546.00) Inc(32.9) Azm(246.9) TVD(6402.52) DLS(7.7)

#69 MD(6642.00) Inc(35.5) Azm(251.0) TVD(6481.92) DLS(3.6)

#70 MD(6737.00) Inc(41.8) Azm(251.3) TVD(6556.08) DLS(6.6)

#71 MD(6833.00) Inc(47.5) Azm(253.1) TVD(6624.35) DLS(6.1)

#72 MD(6929.00) Inc(52.2) Azm(253.4) TVD(6686.23) DLS(4.9)

#73 MD(7024.00) Inc(58.2) Azm(255.9) TVD(6740.43) DLS(6.7)

#74 MD(7120.00) Inc(68.2) Azm(259.6) TVD(6783.67) DLS(11.0)

#75 MD(7215.00) Inc(74.0) Azm(265.2) TVD(6814.45) DLS(8.3)

#76 MD(7311.00) Inc(79.6) Azm(269.3) TVD(6836.37) DLS(7.2)

#77 MD(7406.00) Inc(86.3) Azm(268.6) TVD(6848.03) DLS(7.1)

#78 MD(7501.00) Inc(89.8) Azm(270.8) TVD(6851.26) DLS(4.4)

#79 MD(7597.00) Inc(89.2) Azm(271.0) TVD(6852.10) DLS(0.7)

#80 MD(7721.00) Inc(88.5) Azm(270.8) TVD(6854.58) DLS(0.6)

#81 MD(7816.00) Inc(89.8) Azm(270.5) TVD(6855.99) DLS(1.4)

#82 MD(7912.00) Inc(91.3) Azm(271.2) TVD(6855.07) DLS(1.7)

#83 MD(8007.00) Inc(90.1) Azm(271.0) TVD(6853.91) DLS(1.3)

#84 MD(8103.00) Inc(92.1) Azm(270.0) TVD(6852.07) DLS(2.3)

#85 MD(8198.00) Inc(91.8) Azm(270.1) TVD(6848.84) DLS(0.3)

#86 MD(8294.00) Inc(91.5) Azm(269.3) TVD(6846.07) DLS(0.9)

#87 MD(8389.00) Inc(91.5) Azm(268.6) TVD(6843.59) DLS(0.7)

#88 MD(8484.00) Inc(91.8) Azm(268.0) TVD(6840.85) DLS(0.7)

#89 MD(8580.00) Inc(91.8) Azm(267.3) TVD(6837.83) DLS(0.7)

#90 MD(8676.00) Inc(90.7) Azm(269.4) TVD(6835.74) DLS(2.5)

#91 MD(8772.00) Inc(90.8) Azm(269.3) TVD(6834.48) DLS(0.1)

#92 MD(8867.00) Inc(90.9) Azm(269.1) TVD(6833.07) DLS(0.2)

#93 MD(8963.00) Inc(90.9) Azm(268.6) TVD(6831.57) DLS(0.5)

#94 MD(9058.00) Inc(89.5) Azm(269.3) TVD(6831.23) DLS(1.6)

#95 MD(9154.00) Inc(89.1) Azm(268.6) TVD(6832.41) DLS(0.8)

#96 MD(9250.00) Inc(88.7) Azm(268.2) TVD(6834.25) DLS(0.6)

#97 MD(9345.00) Inc(88.5) Azm(267.9) TVD(6836.57) DLS(0.4)

#98 MD(9440.00) Inc(88.3) Azm(268.0) TVD(6839.22) DLS(0.2)

#99 MD(9535.00) Inc(87.8) Azm(267.5) TVD(6842.46) DLS(0.7)

#100 MD(9631.00) Inc(90.2) Azm(268.7) TVD(6844.13) DLS(2.8)

#101 MD(9726.00) Inc(90.0) Azm(268.2) TVD(6843.97) DLS(0.6)

#102 MD(9822.00) Inc(89.5) Azm(267.5) TVD(6844.38) DLS(0.9)

#103 MD(9917.00) Inc(88.8) Azm(267.0) TVD(6845.79) DLS(0.9)

#104 MD(10012.00) Inc(88.5) Azm(266.6) TVD(6848.03) DLS(0.5)

#105 MD(10108.00) Inc(91.5) Azm(268.7) TVD(6848.03) DLS(3.8)

#106 MD(10203.00) Inc(91.4) Azm(268.6) TVD(6845.63) DLS(0.1)

#107 MD(10299.00) Inc(91.4) Azm(267.7) TVD(6843.28) DLS(0.9)

#108 MD(10394.00) Inc(91.4) Azm(267.2) TVD(6840.96) DLS(0.5)

#109 MD(10489.00) Inc(91.5) Azm(267.3) TVD(6838.56) DLS(0.1)

#110 MD(10585.00) Inc(91.6) Azm(266.5) TVD(6835.96) DLS(0.8)

#111 MD(10679.00) Inc(90.7) Azm(268.9) TVD(6834.07) DLS(2.7)

#112 MD(10775.00) Inc(90.0) Azm(269.4) TVD(6833.49) DLS(0.9)

#113 MD(10870.00) Inc(89.8) Azm(268.9) TVD(6833.65) DLS(0.6)

#114 MD(10966.00) Inc(89.7) Azm(267.9) TVD(6834.07) DLS(1.0)

#115 MD(11062.00) Inc(90.4) Azm(267.5) TVD(6833.99) DLS(0.8)

#116 MD(11157.00) Inc(90.7) Azm(266.6) TVD(6833.08) DLS(1.0)

#117 MD(11253.00) Inc(90.9) Azm(269.3) TVD(6831.74) DLS(2.8)

#118 MD(11348.00) Inc(91.3) Azm(268.9) TVD(6829.91) DLS(0.6)

#119 MD(11444.00) Inc(91.5) Azm(268.4) TVD(6827.57) DLS(0.6)

#120 MD(11539.00) Inc(91.5) Azm(267.9) TVD(6825.08) DLS(0.5)

#121 MD(11634.00) Inc(89.3) Azm(268.7) TVD(6824.42) DLS(2.5)

#122 MD(11730.00) Inc(89.3) Azm(267.5) TVD(6825.59) DLS(1.2)

#123 MD(11825.00) Inc(89.4) Azm(267.9) TVD(6826.67) DLS(0.4)

#124 MD(11919.00) Inc(89.0) Azm(267.3) TVD(6827.98) DLS(0.8)

#125 MD(12015.00) Inc(88.8) Azm(266.3) TVD(6829.82) DLS(1.1)

#126 MD(12110.00) Inc(90.4) Azm(268.9) TVD(6830.49) DLS(3.2)

#127 MD(12206.00) Inc(90.3) Azm(268.4) TVD(6829.90) DLS(0.5)

#128 MD(12301.00) Inc(89.9) Azm(267.5) TVD(6829.73) DLS(1.0)

#129 MD(12396.00) Inc(90.5) Azm(269.6) TVD(6829.40) DLS(2.3)

#130 MD(12492.00) Inc(90.4) Azm(268.9) TVD(6828.65) DLS(0.7)

#131 MD(12587.00) Inc(90.0) Azm(268.0) TVD(6828.32) DLS(1.0)

#132 MD(12682.00) Inc(91.2) Azm(269.1) TVD(6827.32) DLS(1.7)

#133 MD(12778.00) Inc(91.5) Azm(269.6) TVD(6825.06) DLS(0.6)

#134 MD(12874.00) Inc(91.4) Azm(269.1) TVD(6822.63) DLS(0.5)

#135 MD(12969.00) Inc(91.0) Azm(268.0) TVD(6820.64) DLS(1.2)

#136 MD(13065.00) Inc(90.9) Azm(267.2) TVD(6819.05) DLS(0.8)

#137 MD(13161.00) Inc(91.1) Azm(269.8) TVD(6817.37) DLS(2.7)

#138 MD(13256.00) Inc(91.4) Azm(269.3) TVD(6815.30) DLS(0.6)

#139 MD(13352.00) Inc(92.2) Azm(268.9) TVD(6812.29) DLS(0.9)

#140 MD(13447.00) Inc(90.7) Azm(270.7) TVD(6809.88) DLS(2.5)

#141 MD(13543.00) Inc(90.6) Azm(270.3) TVD(6808.79) DLS(0.4)

#142 MD(13639.00) Inc(91.1) Azm(269.6) TVD(6807.37) DLS(0.9)

#143 MD(13735.00) Inc(91.5) Azm(269.1) TVD(6805.19) DLS(0.7)

#144 MD(13830.00) Inc(89.0) Azm(270.1) TVD(6804.78) DLS(2.8)

#145 MD(13926.00) Inc(88.6) Azm(269.6) TVD(6806.79) DLS(0.7)

#146 MD(14021.00) Inc(88.4) Azm(268.7) TVD(6809.27) DLS(1.0)

#147 MD(14116.00) Inc(88.6) Azm(268.0) TVD(6811.76) DLS(0.8)

#148 MD(14212.00) Inc(89.2) Azm(266.8) TVD(6813.60) DLS(1.4)

#149 MD(14308.00) Inc(89.7) Azm(265.6) TVD(6814.53) DLS(1.4)

#150 MD(14404.00) Inc(89.3) Azm(268.2) TVD(6815.36) DLS(2.7)

#151 MD(14499.00) Inc(89.7) Azm(268.2) TVD(6816.19) DLS(0.4)

#152 MD(14595.00) Inc(90.1) Azm(267.2) TVD(6816.36) DLS(1.1)

#153 MD(14690.00) Inc(90.7) Azm(266.5) TVD(6815.70) DLS(1.0)

#154 MD(14786.00) Inc(90.4) Azm(269.8) TVD(6814.77) DLS(3.5)

#155 MD(14881.00) Inc(91.2) Azm(269.3) TVD(6813.45) DLS(1.0)

#156 MD(14976.00) Inc(92.0) Azm(268.2) TVD(6810.80) DLS(1.4)

#157 MD(15072.00) Inc(92.2) Azm(267.3) TVD(6807.28) DLS(1.0)

#158 MD(15118.00) Inc(92.1) Azm(266.8) TVD(6805.55) DLS(1.1)