



Company: Chevron Appalachia, LLC  
 Well: Francis 9H  
 Location: Continental US  
 Rig: Francis Unit

Job Number: 6803644  
 Magnetic Decl.: -8.65  
 Grid Corr.: 0.00  
 Total Grid Corr.: -8.65

Calculation Method: Minimum Curvature  
 Proposed Azimuth: 141.46  
 Depth Reference: Rig Floor  
 Tie Into:

Survey Tool Type	Survey Depth (ft)	Inclination (deg)	Azimuth (deg)	Direction	Course Length (ft)	True Vertical Depth (ft)	Vertical Section (ft)	Coordinates		Closure		Dogleg Severity (d/100')	Build Rate (d/100')	Walk Rate (d/100')
								N/S (ft)	E/W (ft)	Distance (ft)	Angle (deg)			
Tie In Coordinates														
N/A	0	0.00	0.00	N 0.0 E	0	0	0	0 N	0 E					
Gyro	32	0.00	112.68	S 67.3 E	32	32.00	0.00	0.00 N	0.00 E	0.00	0.00	0.00	0.00	352.12
Gyro	100	0.19	112.68	S 67.3 E	68	100.00	0.10	-0.04 N	0.10 E	0.11	-67.32	0.28	0.28	0.00
Gyro	200	0.18	107.78	S 72.2 E	100	200.00	0.37	-0.16 N	0.41 E	0.44	-69.09	0.02	-0.01	-4.90
Gyro	300	0.10	142.49	S 37.5 E	100	300.00	0.59	-0.27 N	0.61 E	0.67	-65.90	0.11	-0.08	34.71
Gyro	400	0.13	149.59	S 30.4 E	100	400.00	0.79	-0.44 N	0.72 E	0.84	-58.59	0.03	0.03	7.10
Gyro	500	0.12	158.93	S 21.1 E	100	500.00	1.00	-0.64 N	0.81 E	1.03	-52.07	0.02	-0.01	9.34
Gyro	600	0.09	162.53	S 17.5 E	100	600.00	1.18	-0.81 N	0.88 E	1.19	-47.32	0.03	-0.03	3.60
Gyro	700	0.10	235.22	S 55.2 W	100	700.00	1.25	-0.93 N	0.83 E	1.25	-41.60	0.11	0.01	72.69
Gyro	711	0.07	221.76	S 41.8 W	11	711.00	1.25	-0.94 N	0.82 E	1.25	-40.86	0.33	-0.27	-122.36
MWD	769	0.09	285.76	N 74.2 W	58	769.00	1.21	-0.96 N	0.75 E	1.21	-38.02	0.15	0.03	110.34
MWD	863	0.26	285.64	N 74.4 W	94	863.00	0.98	-0.88 N	0.47 E	1.00	-28.21	0.18	0.18	-0.13
MWD	958	0.44	315.52	N 44.5 W	95	958.00	0.44	-0.56 N	0.01 E	0.56	-0.89	0.26	0.19	31.45
MWD	1053	0.79	316.23	N 43.8 W	95	1052.99	-0.57	0.17 N	-0.70 E	0.72	-76.19	0.37	0.37	0.75
MWD	1147	1.14	320.32	N 39.7 W	94	1146.98	-2.15	1.36 N	-1.75 E	2.21	-52.08	0.38	0.37	4.35
MWD	1242	1.44	320.07	N 39.9 W	95	1241.95	-4.29	3.00 N	-3.11 E	4.33	-46.05	0.32	0.32	-0.26
MWD	1336	1.72	319.94	N 40.1 W	94	1335.92	-6.88	4.99 N	-4.78 E	6.91	-43.79	0.30	0.30	-0.14
MWD	1431	1.96	320.95	N 39.1 W	95	1430.87	-9.93	7.34 N	-6.72 E	9.95	-42.48	0.25	0.25	1.06
MWD	1535	2.43	334.18	N 25.8 W	104	1534.79	-13.86	10.71 N	-8.80 E	13.86	-39.43	0.66	0.45	12.72
MWD	1620	1.91	350.28	N 9.7 W	85	1619.73	-16.86	13.72 N	-9.83 E	16.88	-35.60	0.94	-0.61	18.94
MWD	1714	1.40	52.32	N 52.3 E	94	1713.70	-18.21	15.97 N	-9.18 E	18.42	-29.90	1.87	-0.54	66.00
MWD	1808	2.96	73.40	N 73.4 E	94	1807.63	-17.29	17.37 N	-5.95 E	18.36	-18.90	1.84	1.66	22.43
MWD	1855	4.09	70.66	N 70.7 E	47	1854.54	-16.28	18.27 N	-3.20 E	18.55	-9.94	2.43	2.40	-5.83
MWD	1903	5.30	80.82	N 80.8 E	48	1902.38	-14.63	19.19 N	0.60 E	19.20	1.79	3.05	2.52	21.17
MWD	1950	6.63	94.20	S 85.8 E	47	1949.13	-11.73	19.34 N	5.45 E	20.09	15.74	4.08	2.83	28.47
MWD	1998	7.03	107.95	S 71.1 E	48	1996.79	-7.40	18.23 N	11.01 E	21.29	31.13	3.50	0.83	28.65
MWD	2045	7.03	114.16	S 65.8 E	47	2043.43	-2.44	16.16 N	16.37 E	23.01	45.36	1.62	0.00	13.21
MWD	2092	7.24	114.79	S 65.2 E	47	2090.07	2.76	13.75 N	21.68 E	25.67	57.63	0.48	0.45	1.34
MWD	2187	7.68	112.23	S 67.8 E	95	2184.27	13.65	8.83 N	32.99 E	34.15	75.01	0.58	0.46	-2.69
MWD	2282	7.29	115.65	S 64.4 E	95	2278.46	24.61	3.82 N	44.30 E	44.47	85.07	0.62	-0.41	3.60
MWD	2376	7.03	119.71	S 60.3 E	94	2371.73	35.32	-1.61 N	54.67 E	54.70	-88.31	0.61	-0.28	4.32
MWD	2471	3.99	134.47	S 45.5 E	95	2466.28	44.01	-6.81 N	62.08 E	62.46	-83.74	3.51	-3.20	15.54
MWD	2565	2.43	150.17	S 29.8 E	94	2560.13	49.22	-10.83 N	65.41 E	66.30	-80.60	1.89	-1.66	16.70
MWD	2642	2.22	155.73	S 24.3 E	77	2637.07	52.28	-13.60 N	66.84 E	68.21	-78.50	0.40	-0.27	7.22
MWD	2769	1.40	164.80	S 15.2 E	127	2764.00	56.09	-17.34 N	68.25 E	70.42	-75.74	0.68	-0.65	7.14
MWD	2864	2.71	135.68	S 44.3 E	95	2858.94	59.39	-20.07 N	70.13 E	72.94	-74.03	1.72	1.38	-30.65
MWD	2958	3.20	123.00	S 57.0 E	94	2952.82	64.09	-23.09 N	73.88 E	77.40	-72.65	0.87	0.52	-13.49
MWD	3053	3.30	82.66	N 82.7 E	95	3047.68	68.02	-24.18 N	78.82 E	82.44	-72.94	2.36	0.11	-42.46
MWD	3147	4.18	68.87	N 68.9 E	94	3141.48	70.45	-22.60 N	84.69 E	87.66	-75.06	1.33	0.94	-14.67
MWD	3242	5.31	68.85	N 68.9 E	95	3236.15	72.80	-19.77 N	92.02 E	94.12	-77.88	1.19	1.19	-0.02
MWD	3336	6.40	52.24	N 52.2 E	94	3329.67	74.17	-14.99 N	100.22 E	101.34	-81.49	2.13	1.16	-17.67
MWD	3430	8.68	47.10	N 47.1 E	94	3422.85	73.70	-6.95 N	109.56 E	109.78	-86.37	2.53	2.43	-5.47
MWD	3525	9.40	41.71	N 41.7 E	95	3516.67	71.84	3.72 N	119.98 E	120.03	88.22	1.17	0.76	-5.67
MWD	3620	9.75	61.12	N 61.1 E	95	3610.37	71.88	13.40 N	132.18 E	132.86	84.21	3.40	0.37	20.43
MWD	3715	7.47	60.57	N 60.6 E	95	3704.29	74.21	20.32 N	144.61 E	146.03	82.00	2.40	-2.40	-0.58
MWD	3809	5.47	46.78	N 46.8 E	94	3797.70	74.81	26.39 N	153.20 E	155.45	80.23	2.68	-2.13	-14.67
MWD	3903	8.15	52.51	N 52.5 E	94	3891.02	74.57	33.51 N	161.75 E	165.19	78.29	2.94	2.85	6.10
MWD	3998	7.25	59.34	N 59.3 E	95	3985.17	75.51	40.67 N	172.25 E	176.99	76.72	1.35	-0.95	7.19
MWD	4093	7.63	52.92	N 52.9 E	95	4079.37	76.49	47.53 N	182.44 E	188.53	75.40	0.96	0.40	-6.76
MWD	4187	4.41	38.83	N 38.8 E	94	4172.85	75.86	54.11 N	189.69 E	197.25	74.08	3.74	-3.43	-14.99
MWD	4282	2.63	29.35	N 29.4 E	95	4267.66	74.24	58.85 N	193.04 E	201.82	73.04	1.97	-1.87	-9.98
MWD	4377	1.70	17.78	N 17.8 E	95	4362.59	72.64	62.10 N	194.54 E	204.21	72.30	1.08	-0.98	-12.18
MWD	4471	1.10	17.62	N 17.6 E	94	4456.57	71.37	64.28 N	195.24 E	205.55	71.78	0.64	-0.64	-0.17
MWD	4566	0.70	352.04	N 8.0 W	95	4551.55	70.36	65.73 N	195.44 E	206.19	71.41	0.59	-0.42	-26.93
MWD	4661	0.47	321.39	N 38.6 W	95	4646.55	69.47	66.61 N	195.11 E	206.17	71.15	0.40	-0.24	-32.26
MWD	4755	0.71	316.22	N 43.8 W	94	4740.54	68.50	67.33 N	194.47 E	205.80	70.90	0.26	0.26	-5.50
MWD	4850	0.57	307.15	N 52.9 W	95	4835.54	67.46	68.04 N	193.69 E	205.29	70.64	0.18	-0.15	-9.55
MWD	4945	0.77	303.19	N 56.8 W	95	4930.53	66.40	68.67 N	192.78 E	204.64	70.39	0.22	0.21	-4.17
MWD	5039	0.51	314.48	N 45.5 W	94	5024.53	65.38	69.31 N	191.95 E	204.08	70.15	0.31	-0.28	12.01
MWD	5134	0.72	317.64	N 42.4 W	95	5119.52	64.37	70.05 N	191.24 E	203.67	69.88	0.22	0.22	3.33
MWD	5228	0.54	297.69	N 62.3 W	94	5213.52	63.37	70.69 N	190.45 E	203.15	69.64	0.30	-0.19	-21.22
MWD	5261	0.70	307.43	N 52.6 W	33	5246.51	63.03	70.89 N	190.16 E	202.94	69.56	0.58	0.58	12.92
MWD	5318	2.62	55.27	N 55.3 E	57	5303.49	62.78	71.84 N	190.95 E	204.02	69.38	5.11	3.37	189.49
MWD	5362	6.90	58.70	N 58.7 E	44	5347.33	63.18	73.79 N	194.04 E	207.59	69.18	9.73	7.90	7.90
MWD	5413	9.35	63.07	N 63.1 E	51	5397.82	64.40	77.26 N	200.35 E	214.73	68.91	4.95	4.80	8.57
MWD	5508	8.99	78.81	N 78.8 E	95	5491.62	69.37	82.19 N	214.51 E	229.72	69.04	2.66	-0.66	7.90
MWD	5602	13.28	87.59	N 87.6 E	94	5583.83	79.11	84.07 N	232.51 E	247.25	70.12	4.89	4.56	9.34
MWD	5697	18.09	89.17	N 89.2 E	95	5675.27	94.57	84.75 N	258.18 E	271.73	71.83	5.08	5.06	1.66
MWD	5791	21.11	84.57	N 84.6 E	94	5763.82	112.75	86.56 N	289.63 E	302.29	73.36	3.61	3.21	-4.89
MWD	5885	22.15	81.64	N 81.6 E	94	5851.20	130.91	90.74 N	324.01 E	336.48	74.36	1.59	1.10	-3.12
MWD	5980	21.76	78.23	N 78.2 E	95	5939.32	147.84	96.93 N	358.97 E	371.83	74.89	1.40	-0.41	-3.59
MWD	6075	23.43	74.78	N 74.8 E	95	6027.02	163.25	105.48 N	394.44 E	408.30				



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Calculation Method Minimum Curvature  
 Proposed Azimuth 141.46  
 Depth Reference Rig Floor  
 Tie Into:

Survey Tool Type	Survey Depth (ft)	Inclination (deg)	Azimuth (deg)	Direction	Course Length (ft)	True Vertical Depth (ft)	Vertical Section (ft)	Coordinates		Closure		Dogleg Severity (d/100')	Build Rate (d/100')	Walk Rate (d/100')
								N/S (ft)	E/W (ft)	Distance (ft)	Angle (deg)			
MWD	6738	66.99	138.17	S 41.8 E	94	6514.25	479.54	6.17 N	777.40 E	777.42	89.55	14.65	11.69	10.09
MWD	6833	76.50	145.38	S 34.6 E	95	6544.01	569.58	-64.66 N	832.99 E	835.50	-85.56	12.33	10.01	7.59
MWD	6928	85.29	148.46	S 31.5 E	95	6559.04	662.85	-143.19 N	884.11 E	895.63	-80.80	9.79	9.25	3.24
MWD	7023	86.27	146.28	S 33.7 E	95	6566.03	757.09	-222.98 N	935.19 E	961.41	-76.59	2.51	1.03	-2.29
MWD	7057	86.89	147.06	S 32.9 E	34	6568.06	790.89	-251.33 N	953.84 E	986.40	-75.24	2.93	1.82	2.29
MWD	7117	86.00	144.60	S 35.4 E	60	6571.78	850.59	-300.87 N	987.47 E	1032.29	-73.05	4.35	-1.48	-4.10
MWD	7212	87.26	142.60	S 37.4 E	95	6577.36	945.35	-377.20 N	1043.75 E	1109.81	-70.13	2.49	1.33	-2.11
MWD	7307	87.72	140.63	S 39.4 E	95	6581.52	1040.26	-451.59 N	1102.68 E	1191.57	-67.73	2.13	0.48	-2.07
MWD	7401	88.98	139.37	S 40.6 E	94	6584.23	1134.18	-523.57 N	1163.07 E	1275.48	-65.76	1.90	1.34	-1.34
MWD	7496	89.48	137.99	S 42.0 E	95	6585.51	1229.06	-594.91 N	1225.79 E	1362.52	-64.11	1.54	0.53	-1.45
MWD	7591	89.75	137.10	S 42.9 E	95	6586.14	1323.84	-665.00 N	1289.91 E	1451.24	-62.73	0.98	0.28	-0.94
MWD	7686	88.98	134.63	S 45.4 E	95	6587.20	1418.37	-733.17 N	1356.06 E	1541.57	-61.60	2.72	-0.81	-2.60
MWD	7780	89.42	134.12	S 45.9 E	94	6588.51	1511.64	-798.90 N	1423.24 E	1632.13	-60.69	0.72	0.47	-0.54
MWD	7874	89.51	131.85	S 48.2 E	94	6589.39	1604.61	-862.98 N	1491.99 E	1723.60	-59.95	2.42	0.10	-2.41
MWD	7969	88.55	134.95	S 45.1 E	95	6591.00	1698.64	-928.24 N	1561.00 E	1816.14	-59.26	3.42	-1.01	3.26
MWD	8064	88.98	137.14	S 42.9 E	95	6593.04	1793.19	-996.61 N	1626.92 E	1907.90	-58.51	2.35	0.45	2.31
MWD	8158	89.42	139.14	S 40.9 E	94	6594.36	1887.02	-1066.61 N	1689.64 E	1998.13	-57.74	2.18	0.47	2.13
MWD	8252	89.35	138.60	S 41.4 E	94	6595.36	1980.92	-1137.40 N	1751.46 E	2088.38	-57.00	0.58	-0.07	-0.57
MWD	8347	87.75	138.26	S 41.7 E	95	6597.77	2075.75	-1208.45 N	1814.48 E	2180.07	-56.34	1.72	-1.68	-0.36
MWD	8442	89.45	145.35	S 34.7 E	95	6600.09	2170.66	-1283.04 N	1873.16 E	2270.45	-55.59	7.67	1.79	7.46
MWD	8537	90.46	147.58	S 32.4 E	95	6600.17	2265.29	-1362.22 N	1925.64 E	2358.76	-54.72	2.58	1.06	2.35
MWD	8631	90.52	145.99	S 34.0 E	94	6599.36	2358.87	-1440.86 N	1977.13 E	2446.45	-53.92	1.69	0.06	-1.69
MWD	8726	90.52	144.13	S 35.9 E	95	6598.50	2453.68	-1518.73 N	2031.53 E	2536.47	-53.22	1.96	0.00	-1.96
MWD	8821	88.98	143.49	S 36.5 E	95	6598.92	2548.59	-1595.40 N	2087.62 E	2627.44	-52.61	1.76	-1.62	-0.67
MWD	8915	89.51	144.89	S 35.1 E	94	6600.15	2642.48	-1671.62 N	2142.62 E	2717.56	-52.04	1.59	0.56	1.49
MWD	9010	89.42	148.21	S 31.8 E	95	6601.04	2737.08	-1750.87 N	2194.97 E	2807.75	-51.42	3.50	-0.09	3.49
MWD	9105	89.48	151.40	S 28.6 E	95	6601.95	2831.06	-1832.97 N	2242.74 E	2896.49	-50.74	3.36	0.06	3.36
MWD	9199	89.69	150.91	S 29.1 E	94	6602.63	2923.72	-1915.30 N	2288.09 E	2983.91	-50.07	0.57	0.22	-0.52
MWD	9294	89.57	145.30	S 34.7 E	95	6603.25	3018.04	-1995.92 N	2338.26 E	3074.28	-49.52	5.91	-0.13	-5.91
MWD	9389	89.57	143.18	S 36.8 E	95	6603.96	3112.92	-2073.01 N	2393.78 E	3166.63	-49.11	2.23	0.00	-2.23
MWD	9484	89.14	141.25	S 38.8 E	95	6605.03	3207.90	-2148.08 N	2451.98 E	3259.82	-48.78	2.08	-0.45	-2.03
MWD	9578	89.14	141.51	S 38.5 E	94	6606.44	3301.89	-2221.51 N	2510.64 E	3352.38	-48.50	0.28	0.00	0.28
MWD	9673	89.05	139.60	S 40.4 E	95	6607.94	3396.86	-2294.86 N	2570.99 E	3446.21	-48.25	2.01	-0.09	-2.01
MWD	9767	89.20	138.46	S 41.5 E	94	6609.38	3490.76	-2365.83 N	2632.61 E	3539.46	-48.06	1.22	0.16	-1.21
MWD	9862	89.26	138.37	S 41.6 E	95	6610.65	3585.62	-2436.88 N	2695.66 E	3633.86	-47.89	0.11	0.06	-0.09
MWD	9956	88.34	138.95	S 41.1 E	94	6612.62	3679.49	-2507.44 N	2757.73 E	3727.24	-47.72	1.16	-0.98	0.62
MWD	10051	88.37	140.91	S 39.1 E	95	6615.35	3774.41	-2580.10 N	2818.86 E	3821.37	-47.53	2.06	0.03	2.06
MWD	10145	88.28	140.39	S 39.6 E	94	6618.10	3868.36	-2652.76 N	2878.43 E	3914.40	-47.34	0.56	-0.10	-0.55
MWD	10240	88.46	141.61	S 38.4 E	95	6620.80	3963.32	-2726.56 N	2938.19 E	4008.38	-47.14	1.30	0.19	1.28
MWD	10335	89.29	142.14	S 37.9 E	95	6622.67	4058.29	-2801.28 N	2996.83 E	4102.22	-46.93	1.04	0.87	0.56
MWD	10430	88.98	142.05	S 38.0 E	95	6624.10	4153.28	-2876.23 N	3055.19 E	4196.05	-46.73	0.34	-0.33	-0.09
MWD	10524	89.11	141.38	S 38.6 E	94	6625.67	4247.26	-2950.00 N	3113.42 E	4289.04	-46.54	0.73	0.14	-0.71
MWD	10619	89.20	142.02	S 38.0 E	95	6627.07	4342.25	-3024.55 N	3172.29 E	4383.07	-46.37	0.68	0.09	0.67
MWD	10714	89.02	143.54	S 36.5 E	95	6628.54	4437.21	-3100.18 N	3229.75 E	4476.88	-46.17	1.61	-0.19	1.60
MWD	10808	89.14	143.96	S 36.0 E	94	6630.05	4531.12	-3175.98 N	3285.33 E	4569.49	-45.97	0.46	0.13	0.45
MWD	10903	89.23	143.99	S 36.0 E	95	6631.40	4626.02	-3252.80 N	3341.19 E	4663.08	-45.77	0.10	0.09	0.03
MWD	10998	89.17	143.87	S 36.1 E	95	6632.73	4720.93	-3329.59 N	3397.12 E	4756.74	-45.58	0.14	-0.06	-0.13
MWD	11092	89.35	145.80	S 34.2 E	94	6633.94	4814.75	-3406.42 N	3451.25 E	4849.21	-45.37	2.06	0.19	2.05
MWD	11186	89.17	144.08	S 35.9 E	94	6635.16	4908.57	-3483.35 N	3505.24 E	4941.71	-45.18	1.84	-0.19	-1.83
MWD	11281	89.17	140.32	S 39.7 E	95	6636.54	5003.53	-3558.40 N	3563.45 E	5035.91	-45.04	3.96	0.00	-3.96
MWD	11376	89.29	140.17	S 39.8 E	95	6637.81	5098.50	-3631.43 N	3624.20 E	5130.50	-44.94	0.20	0.13	-0.16
MWD	11470	89.26	140.43	S 39.6 E	94	6639.00	5192.47	-3703.74 N	3684.24 E	5224.11	-44.85	0.28	-0.03	0.28
MWD	11565	89.02	139.63	S 40.4 E	95	6640.43	5287.43	-3776.54 N	3745.26 E	5318.76	-44.76	0.88	-0.25	-0.84
MWD	11659	89.14	140.29	S 39.7 E	94	6641.94	5381.39	-3848.50 N	3805.72 E	5412.43	-44.68	0.71	0.13	0.70
MWD	11754	89.20	139.72	S 40.3 E	95	6643.31	5476.35	-3921.27 N	3866.77 E	5507.11	-44.60	0.60	0.06	-0.60
MWD	11848	89.26	139.72	S 40.3 E	94	6644.58	5570.30	-3992.97 N	3927.54 E	5600.84	-44.53	0.06	0.06	0.00
MWD	11911	89.23	140.04	S 40.0 E	63	6645.41	5633.27	-4041.15 N	3968.13 E	5663.65	-44.48	0.51	-0.05	0.51
MWD	11936	89.23	140.04	S 40.0 E	25	6645.74	5658.26	-4060.30 N	3984.19 E	5688.57	-44.46	0.00	0.00	0.00
MWD														
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