

# Minimum Radius of Curvature

**API: 51-23-51801**      **Well: Hens 06NHS**      **Wellhead Location N+/S- : 40.328210**  
**Operator: PDC Energy**      **Area: DJ**      **E+/W- : -104.572340**  
**Rig:**      **Type: U-Lateral**      **Magnetic Declination: 7.76**  
**TD: 23,209'**      **Plane of Proposal: 90.10**

Measured Depth Ft	Drift Angle Deg	Azimuth Direction Deg	Course Length Ft	TVD Ft	Vertical Section Ft	COORDINATES		CLOSURE		Dog Leg Severity Deg/100'	Build / Drop Deg/100'	Left / Right Deg/100'
						N-S Ft	E-W Ft	Distance FT	Direction Deg			
0.00	0.00	0.00		0.0	0.00	0.00	0.00	0.00	0.00			
100	0.00	0.00	100	100.0	104.64	0.00	0.00	0.00	#DIV/0!	0.00		
200	0.00	0.00	100	200.0	104.64	0.00	0.00	0.00	#DIV/0!	0.00		
300	0.00	0.00	100	300.0	104.64	0.00	0.00	0.00	#DIV/0!	0.00		
400	0.00	0.00	100	400.0	104.64	0.00	0.00	0.00	#DIV/0!	0.00		
500	0.00	0.00	100	500.0	104.64	0.00	0.00	0.00	#DIV/0!	0.00		
600	0.00	0.00	100	600.0	104.64	0.00	0.00	0.00	#DIV/0!	0.00		
700	0.00	0.00	100	700.0	104.64	0.00	0.00	0.00	#DIV/0!	0.00		
800	0.00	0.00	100	800.0	104.64	0.00	0.00	0.00	#DIV/0!	0.00		
900	2.00	312.27	100	900.0	103.35	1.17	-1.29	1.75	312.27	2.00	2.00	312.27
1000	4.00	312.27	100	999.8	99.47	4.69	-5.16	6.98	312.27	2.00	2.00	0.00
1100	6.00	312.27	100	1099.5	93.01	10.56	-11.61	15.69	312.27	2.00	2.00	0.00
1200	8.00	312.27	100	1198.7	83.98	18.75	-20.63	27.88	312.27	2.00	2.00	0.00
1300	10.00	312.27	100	1297.5	72.39	29.27	-32.21	43.52	312.27	2.00	2.00	0.00
1400	12.00	312.27	100	1395.6	58.24	42.11	-46.32	62.60	312.27	2.00	2.00	0.00
1500	14.00	312.27	100	1493.1	41.57	57.24	-62.97	85.10	312.27	2.00	2.00	0.00
1575	15.51	312.27	75	1566.0	27.34	70.15	-77.18	104.30	312.27	2.00	2.00	0.00
1600	15.51	312.27	25	1589.7	22.47	74.58	-82.05	110.88	312.27	0.00	0.00	0.00
1700	15.51	312.27	100	1686.0	2.65	92.57	-101.84	137.62	312.27	0.00	0.00	0.00
1800	15.51	312.27	100	1782.4	-17.17	110.55	-121.62	164.36	312.27	0.00	0.00	0.00
1900	15.51	312.27	100	1878.7	-36.99	128.54	-141.41	191.10	312.27	0.00	0.00	0.00
2000	15.51	312.27	100	1975.1	-56.81	146.52	-161.20	217.84	312.27	0.00	0.00	0.00
2100	15.51	312.27	100	2071.5	-76.63	164.51	-180.99	244.58	312.27	0.00	0.00	0.00
2200	15.51	312.27	100	2167.8	-96.45	182.50	-200.77	271.32	312.27	0.00	0.00	0.00
2300	15.51	312.27	100	2264.2	-116.27	200.48	-220.56	298.06	312.27	0.00	0.00	0.00
2400	15.51	312.27	100	2360.5	-136.09	218.47	-240.35	324.80	312.27	0.00	0.00	0.00
2500	15.51	312.27	100	2456.9	-155.91	236.46	-260.14	351.54	312.27	0.00	0.00	0.00
2600	15.51	312.27	100	2553.3	-175.72	254.44	-279.92	378.28	312.27	0.00	0.00	0.00
2700	15.51	312.27	100	2649.6	-195.54	272.43	-299.71	405.02	312.27	0.00	0.00	0.00
2800	15.51	312.27	100	2746.0	-215.36	290.42	-319.50	431.77	312.27	0.00	0.00	0.00
2900	15.51	312.27	100	2842.3	-235.18	308.40	-339.29	458.51	312.27	0.00	0.00	0.00
3000	15.51	312.27	100	2938.7	-255.00	326.39	-359.07	485.25	312.27	0.00	0.00	0.00
3100	15.51	312.27	100	3035.0	-274.82	344.38	-378.86	511.99	312.27	0.00	0.00	0.00
3200	15.51	312.27	100	3131.4	-294.64	362.36	-398.65	538.73	312.27	0.00	0.00	0.00
3300	15.51	312.27	100	3227.8	-314.46	380.35	-418.44	565.47	312.27	0.00	0.00	0.00
3400	15.51	312.27	100	3324.1	-334.28	398.33	-438.23	592.21	312.27	0.00	0.00	0.00
3500	15.51	312.27	100	3420.5	-354.10	416.32	-458.01	618.95	312.27	0.00	0.00	0.00
3600	15.51	312.27	100	3516.8	-373.92	434.31	-477.80	645.69	312.27	0.00	0.00	0.00
3700	15.51	312.27	100	3613.2	-393.73	452.29	-497.59	672.43	312.27	0.00	0.00	0.00
3800	15.51	312.27	100	3709.6	-413.55	470.28	-517.38	699.17	312.27	0.00	0.00	0.00
3900	15.51	312.27	100	3805.9	-433.37	488.27	-537.16	725.91	312.27	0.00	0.00	0.00
4000	15.51	312.27	100	3902.3	-453.19	506.25	-556.95	752.65	312.27	0.00	0.00	0.00
4100	15.51	312.27	100	3998.6	-473.01	524.24	-576.74	779.39	312.27	0.00	0.00	0.00
4200	15.51	312.27	100	4095.0	-492.83	542.23	-596.53	806.13	312.27	0.00	0.00	0.00
4300	15.51	312.27	100	4191.3	-512.65	560.21	-616.31	832.88	312.27	0.00	0.00	0.00
4400	15.51	312.27	100	4287.7	-532.47	578.20	-636.10	859.62	312.27	0.00	0.00	0.00
4500	15.51	312.27	100	4384.1	-552.29	596.19	-655.89	886.36	312.27	0.00	0.00	0.00
4600	15.51	312.27	100	4480.4	-572.11	614.17	-675.68	913.10	312.27	0.00	0.00	0.00
4700	15.51	312.27	100	4576.8	-591.92	632.16	-695.46	939.84	312.27	0.00	0.00	0.00
4800	15.51	312.27	100	4673.1	-611.74	650.14	-715.25	966.58	312.27	0.00	0.00	0.00
4900	15.51	312.27	100	4769.5	-631.56	668.13	-735.04	993.32	312.27	0.00	0.00	0.00
5000	15.51	312.27	100	4865.9	-651.38	686.12	-754.83	1020.06	312.27	0.00	0.00	0.00
5100	15.51	312.27	100	4962.2	-671.20	704.10	-774.61	1046.80	312.27	0.00	0.00	0.00
5200	15.51	312.27	100	5058.6	-691.02	722.09	-794.40	1073.54	312.27	0.00	0.00	0.00
5300	15.51	312.27	100	5154.9	-710.84	740.08	-814.19	1100.28	312.27	0.00	0.00	0.00
5400	15.51	312.27	100	5251.3	-730.66	758.06	-833.98	1127.02	312.27	0.00	0.00	0.00
5462	15.51	312.27	62	5310.8	-742.91	769.18	-846.21	1143.55	312.27	0.00	0.00	0.00
5500	14.74	312.27	38	5347.7	-750.29	775.88	-853.58	1153.52	312.27	2.02	-2.02	0.00

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**Rig:**      **Type: U-Lateral**      **Magnetic Declination: 7.76**  
**TD: 23,209'**      **Plane of Proposal: 90.10**

Measured Depth Ft	Drift Angle Deg	Azimuth Direction Deg	Course Length Ft	TVD Ft	Vertical Section Ft	COORDINATES		CLOSURE		Dog Leg Severity Deg/100'	Build / Drop Deg/100'	Left / Right Deg/100'
						N-S Ft	E-W Ft	Distance FT	Direction Deg			
5600	12.74	312.27	100	5444.8	-767.90	791.86	-871.16	1177.27	312.27	2.00	-2.00	0.00
5700	10.74	312.27	100	5542.8	-782.97	805.54	-886.21	1197.61	312.27	2.00	-2.00	0.00
5800	8.74	312.27	100	5641.3	-795.51	816.92	-898.73	1214.53	312.27	2.00	-2.00	0.00
5900	6.74	312.27	100	5740.4	-805.49	825.98	-908.70	1228.00	312.27	2.00	-2.00	0.00
6000	4.74	312.27	100	5839.9	-812.91	832.71	-916.10	1238.00	312.27	2.00	-2.00	0.00
6100	2.74	312.27	100	5939.7	-817.74	837.10	-920.92	1244.52	312.27	2.00	-2.00	0.00
6200	0.74	312.27	100	6039.6	-819.99	839.14	-923.17	1247.56	312.27	2.00	-2.00	0.00
6237	0.00	0.00	37	6076.8	-820.17	839.30	-923.35	1247.80	312.27	1.99		
6300	0.00	0.00	63	6139.6	-820.17	839.30	-923.35	1247.80	312.27	0.00		
6337	0.00	0.00	37	6176.8	-820.17	839.30	-923.35	1247.80	312.27	0.00		
6350	1.02	90.10	13	6189.6	-820.06	839.30	-923.23	1247.71	312.27	7.97	7.97	703.91
6400	5.02	90.10	50	6239.5	-817.42	839.29	-920.60	1245.76	312.35	8.00	8.00	0.00
6450	9.02	90.10	50	6289.1	-811.31	839.28	-914.49	1241.25	312.54	8.00	8.00	0.00
6500	13.02	90.10	50	6338.2	-801.76	839.27	-904.94	1234.21	312.84	8.00	8.00	0.00
6550	17.02	90.10	50	6386.5	-788.80	839.24	-891.98	1224.73	313.26	8.00	8.00	0.00
6600	21.02	90.10	50	6433.8	-772.51	839.22	-875.69	1212.89	313.78	8.00	8.00	0.00
6650	25.02	90.10	50	6479.8	-752.96	839.18	-856.14	1198.83	314.43	8.00	8.00	0.00
6700	29.02	90.10	50	6524.3	-730.25	839.14	-833.43	1182.69	315.20	8.00	8.00	0.00
6750	33.02	90.10	50	6567.1	-704.49	839.10	-807.67	1164.65	316.09	8.00	8.00	0.00
6800	37.02	90.10	50	6608.1	-675.80	839.05	-778.98	1144.91	317.13	8.00	8.00	0.00
6850	41.02	90.10	50	6646.9	-644.33	838.99	-747.51	1123.69	318.30	8.00	8.00	0.00
6900	45.02	90.10	50	6683.5	-610.22	838.93	-713.40	1101.25	319.62	8.00	8.00	0.00
6950	49.02	90.10	50	6717.5	-573.65	838.87	-676.83	1077.87	321.10	8.00	8.00	0.00
7000	53.02	90.10	50	6749.0	-534.79	838.80	-637.97	1053.85	322.74	8.00	8.00	0.00
7050	57.02	90.10	50	6777.7	-493.83	838.73	-597.01	1029.51	324.56	8.00	8.00	0.00
7100	61.02	90.10	50	6803.4	-450.97	838.65	-554.15	1005.20	326.54	8.00	8.00	0.00
7150	65.02	90.10	50	6826.1	-406.42	838.58	-509.60	981.28	328.71	8.00	8.00	0.00
7200	69.02	90.10	50	6845.6	-360.40	838.50	-463.58	958.11	331.06	8.00	8.00	0.00
7227	71.21	90.10	27	6854.9	-334.64	838.45	-437.82	945.88	332.43	7.99	7.99	0.00
7250	73.02	90.10	23	6861.8	-313.13	838.41	-416.31	936.08	333.59	8.01	8.01	0.00
7275	75.00	90.10	25	6868.6	-289.39	838.37	-392.57	925.73	334.91	8.02	8.02	0.00
7300	77.02	90.10	25	6874.8	-264.84	838.33	-368.02	915.55	336.30	7.98	7.98	0.00
7350	81.02	90.10	50	6884.3	-215.76	838.24	-318.94	896.87	339.17	8.00	8.00	0.00
7400	85.02	90.10	50	6890.4	-166.14	838.16	-269.32	880.37	342.19	8.00	8.00	0.00
7450	89.02	90.10	50	6893.0	-116.22	838.07	-219.40	866.31	345.33	8.00	8.00	0.00
7468	90.47	90.10	18	6893.0	-98.12	838.04	-201.30	861.88	346.49	8.01	8.01	0.00
7500	90.47	90.10	32	6892.8	-66.22	837.98	-169.40	854.93	348.57	0.00	0.00	0.00
7600	90.47	90.10	100	6892.0	33.77	837.81	-69.41	840.68	355.26	0.00	0.00	0.00
7700	90.47	90.10	100	6891.1	133.77	837.63	30.59	838.19	2.09	0.00	0.00	0.00
7799	90.47	90.10	99	6890.3	232.97	837.46	129.79	847.46	8.81	0.00	0.00	0.00
7800	90.47	90.10	1	6890.3	233.77	837.46	130.59	847.58	8.86	0.00	0.00	0.00
7900	90.46	90.10	100	6889.5	333.76	837.28	230.58	868.46	15.40	0.01	-0.01	0.00
8000	90.46	90.10	100	6888.7	433.76	837.11	330.58	900.02	21.55	0.00	0.00	0.00
8100	90.46	90.10	100	6887.9	533.76	836.94	430.58	941.20	27.22	0.00	0.00	0.00
8200	90.46	90.10	100	6887.1	633.75	836.76	530.57	990.80	32.38	0.00	0.00	0.00
8300	90.46	90.10	100	6886.3	733.75	836.59	630.57	1047.61	37.01	0.00	0.00	0.00
8400	90.46	90.10	100	6885.5	833.75	836.41	730.57	1110.55	41.14	0.00	0.00	0.00
8500	90.45	90.10	100	6884.7	933.74	836.24	830.56	1178.61	44.80	0.01	-0.01	0.00
8600	90.45	90.10	100	6883.9	1033.74	836.06	930.56	1250.98	48.06	0.00	0.00	0.00
8700	90.45	90.10	100	6883.1	1133.74	835.89	1030.56	1326.94	50.95	0.00	0.00	0.00
8800	90.45	90.10	100	6882.3	1233.74	835.71	1130.55	1405.91	53.53	0.00	0.00	0.00
8900	90.45	90.10	100	6881.6	1333.73	835.54	1230.55	1487.41	55.82	0.00	0.00	0.00
9000	90.45	90.10	100	6880.8	1433.73	835.37	1330.55	1571.05	57.88	0.00	0.00	0.00
9100	90.45	90.10	100	6880.0	1533.73	835.19	1430.54	1656.50	59.72	0.00	0.00	0.00
9200	90.44	90.10	100	6879.2	1633.72	835.02	1530.54	1743.50	61.38	0.01	-0.01	0.00
9300	90.44	90.10	100	6878.4	1733.72	834.84	1630.54	1831.83	62.89	0.00	0.00	0.00
9343	90.44	90.10	43	6878.1	1776.52	834.77	1673.34	1870.00	63.49	0.00	0.00	0.00
9400	90.44	90.10	57	6877.7	1833.72	834.67	1730.53	1921.31	64.25	0.00	0.00	0.00

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9500	90.44	90.10	100	6876.9	1933.71	834.49	1830.53	2011.77	65.49	0.00	0.00	0.00
9600	90.44	90.10	100	6876.1	2033.71	834.32	1930.53	2103.10	66.63	0.00	0.00	0.00
9700	90.44	90.10	100	6875.4	2133.71	834.14	2030.53	2195.18	67.67	0.00	0.00	0.00
9800	90.44	90.10	100	6874.6	2233.71	833.97	2130.52	2287.93	68.62	0.00	0.00	0.00
9900	90.43	90.10	100	6873.8	2333.70	833.79	2230.52	2381.27	69.50	0.01	-0.01	0.00
9911	90.43	90.10	11	6873.8	2344.30	833.78	2241.12	2391.19	69.59	0.00	0.00	0.00
10000	90.43	90.10	89	6873.1	2433.70	833.62	2330.52	2475.12	70.32	0.00	0.00	0.00
10100	90.43	90.10	100	6872.3	2533.70	833.45	2430.51	2569.44	71.07	0.00	0.00	0.00
10200	90.43	90.10	100	6871.6	2633.69	833.27	2530.51	2664.17	71.77	0.00	0.00	0.00
10300	90.43	90.10	100	6870.8	2733.69	833.10	2630.51	2759.28	72.43	0.00	0.00	0.00
10366	90.43	90.10	66	6870.3	2799.99	832.98	2696.81	2822.52	72.84	0.00	0.00	0.00
10400	90.43	90.10	34	6870.1	2833.69	832.92	2730.50	2854.72	73.04	0.00	0.00	0.00
10500	90.43	90.10	100	6869.3	2933.69	832.75	2830.50	2950.46	73.61	0.00	0.00	0.00
10600	90.42	90.10	100	6868.6	3033.68	832.57	2930.50	3046.47	74.14	0.01	-0.01	0.00
10700	90.42	90.10	100	6867.9	3133.68	832.40	3030.50	3142.74	74.64	#NUM!	0.00	0.00
10800	90.42	90.10	100	6867.1	3233.68	832.22	3130.49	3239.23	75.11	#NUM!	0.00	0.00
10900	90.42	90.10	100	6866.4	3333.68	832.05	3230.49	3335.92	75.56	#NUM!	0.00	0.00
11000	90.42	90.10	100	6865.7	3433.67	831.87	3330.49	3432.81	75.98	#NUM!	0.00	0.00
11007	90.42	90.10	7	6865.6	3440.27	831.86	3337.09	3439.21	76.00	#NUM!	0.00	0.00
11100	90.42	90.10	93	6864.9	3533.67	831.70	3430.48	3529.86	76.37	#NUM!	0.00	0.00
11144	90.42	90.10	44	6864.6	3578.07	831.62	3474.88	3573.01	76.54	#NUM!	0.00	0.00
11200	90.41	90.10	56	6864.2	3633.67	831.53	3530.48	3627.08	76.75	0.02	-0.02	0.00
11300	90.41	90.10	100	6863.5	3733.66	831.35	3630.48	3724.45	77.10	0.00	0.00	0.00
11400	90.41	90.10	100	6862.8	3833.66	831.18	3730.48	3821.95	77.44	0.00	0.00	0.00
11500	90.41	90.10	100	6862.1	3933.66	831.00	3830.47	3919.58	77.76	0.00	0.00	0.00
11600	90.41	90.11	100	6861.3	4033.66	830.82	3930.47	4017.32	78.06	0.01	0.00	0.01
11688	90.41	90.11	88	6860.7	4121.55	830.65	4018.37	4103.32	78.32	0.00	0.00	0.00
11699	90.41	90.11	11	6860.6	4132.85	830.63	4029.67	4114.39	78.35	0.00	0.00	0.00
11700	90.41	90.11	1	6860.6	4133.65	830.63	4030.47	4115.17	78.36	0.00	0.00	0.00
11800	90.41	90.11	100	6859.9	4233.65	830.43	4130.46	4213.12	78.63	0.00	0.00	0.00
11900	90.40	90.11	100	6859.2	4333.65	830.24	4230.46	4311.16	78.90	0.01	-0.01	0.00
12000	90.40	90.11	100	6858.5	4433.65	830.05	4330.46	4409.29	79.15	0.00	0.00	0.00
12100	90.40	90.11	100	6857.8	4533.64	829.86	4430.46	4507.51	79.39	0.00	0.00	0.00
12200	90.40	90.11	100	6857.1	4633.64	829.67	4530.45	4605.80	79.62	0.00	0.00	0.00
12300	90.40	90.11	100	6856.4	4733.64	829.47	4630.45	4704.16	79.84	0.00	0.00	0.00
12345	90.40	90.11	45	6856.1	4778.24	829.39	4675.05	4748.05	79.94	0.00	0.00	0.00
12398	90.40	90.11	53	6855.7	4831.54	829.29	4728.35	4800.52	80.05	0.00	0.00	0.00
12400	90.40	90.11	2	6855.7	4833.64	829.28	4730.45	4802.59	80.06	0.00	0.00	0.00
12500	90.40	90.11	100	6855.0	4933.63	829.09	4830.45	4901.08	80.26	0.00	0.00	0.00
12600	90.39	90.11	100	6854.3	5033.63	828.90	4930.44	4999.64	80.46	0.01	-0.01	0.00
12700	90.39	90.11	100	6853.6	5133.63	828.71	5030.44	5098.24	80.65	0.00	0.00	0.00
12800	90.39	90.11	100	6853.0	5233.63	828.51	5130.44	5196.91	80.83	0.00	0.00	0.00
12900	90.39	90.11	100	6852.3	5333.63	828.32	5230.44	5295.62	81.00	0.00	0.00	0.00
13000	90.39	90.11	100	6851.6	5433.62	828.13	5330.43	5394.38	81.17	0.00	0.00	0.00
13100	90.39	90.11	100	6850.9	5533.62	827.94	5430.43	5493.18	81.33	0.00	0.00	0.00
13200	90.38	90.11	100	6850.2	5633.62	827.75	5530.43	5592.03	81.49	0.01	-0.01	0.00
13300	90.38	90.11	100	6849.6	5733.62	827.55	5630.43	5690.92	81.64	0.00	0.00	0.00
13400	90.38	90.11	100	6848.9	5833.61	827.36	5730.42	5789.84	81.78	0.00	0.00	0.00
13500	90.38	90.11	100	6848.3	5933.61	827.17	5830.42	5888.81	81.93	0.00	0.00	0.00
13600	90.38	90.11	100	6847.6	6033.61	826.98	5930.42	5987.80	82.06	0.00	0.00	0.00
13700	90.38	90.11	100	6846.9	6133.61	826.79	6030.42	6086.83	82.19	0.00	0.00	0.00
13800	90.38	90.11	100	6846.3	6233.61	826.60	6130.41	6185.89	82.32	0.00	0.00	0.00
13900	90.37	90.11	100	6845.6	6333.60	826.40	6230.41	6284.98	82.44	0.01	-0.01	0.00
14000	90.37	90.11	100	6845.0	6433.60	826.21	6330.41	6384.10	82.56	0.00	0.00	0.00
14100	90.37	90.11	100	6844.3	6533.60	826.02	6430.41	6483.24	82.68	0.00	0.00	0.00
14200	90.37	90.11	100	6843.7	6633.60	825.83	6530.41	6582.41	82.79	0.00	0.00	0.00
14300	90.37	90.11	100	6843.0	6733.59	825.64	6630.40	6681.61	82.90	0.00	0.00	0.00
14350	90.57	94.89	50	6842.6	6783.53	823.45	6680.34	6730.90	82.97	9.57	0.40	9.56

# Minimum Radius of Curvature

**API: 51-23-51801**      **Well: Hens 06NHS**      **Wellhead Location N+/S- : 40.328210**  
**Operator: PDC Energy**      **Area: DJ**      **E+/W- : -104.572340**  
**Rig:**      **Type: U-Lateral**      **Magnetic Declination: 7.76**  
**TD: 23,209'**      **Plane of Proposal: 90.10**

Measured Depth Ft	Drift Angle Deg	Azimuth Direction Deg	Course Length Ft	TVD Ft	Vertical Section Ft	COORDINATES		CLOSURE		Dog Leg Severity Deg/100'	Build / Drop Deg/100'	Left / Right Deg/100'
						N-S Ft	E-W Ft	Distance FT	Direction Deg			
14400	90.77	99.66	50	6842.0	6833.13	817.13	6729.92	6779.34	83.08	9.55	0.40	9.54
14450	90.96	104.43	50	6841.3	6882.02	806.70	6778.80	6826.63	83.21	9.55	0.38	9.54
14500	91.15	109.21	50	6840.4	6929.89	792.23	6826.64	6872.45	83.38	9.57	0.38	9.56
14550	91.32	113.98	50	6839.3	6976.39	773.84	6873.10	6916.53	83.58	9.54	0.34	9.54
14600	91.49	118.76	50	6838.1	7021.19	751.65	6917.87	6958.59	83.80	9.56	0.34	9.56
14650	91.65	123.54	50	6836.7	7064.00	725.80	6960.64	6998.38	84.05	9.56	0.32	9.56
14698	91.79	128.13	48	6835.2	7103.02	697.66	6999.60	7034.29	84.31	9.54	0.29	9.54
14700	91.80	128.31	2	6835.2	7104.51	696.49	7001.10	7035.65	84.32	9.48	0.53	9.47
14714	91.84	129.66	14	6834.7	7115.48	687.62	7012.05	7045.68	84.40	9.57	0.28	9.57
14750	91.93	133.09	36	6833.5	7142.44	663.91	7038.97	7070.21	84.61	9.55	0.25	9.55
14800	92.05	137.87	50	6831.8	7177.53	628.29	7074.00	7101.84	84.92	9.56	0.24	9.56
14850	92.16	142.65	50	6830.0	7209.53	589.88	7105.93	7130.37	85.25	9.56	0.22	9.56
14888	92.23	146.24	38	6828.5	7231.43	559.32	7127.78	7149.69	85.51	9.54	0.19	9.55
14900	92.25	147.43	12	6828.0	7238.23	548.94	7134.55	7155.64	85.60	9.59	0.16	9.60
14950	92.33	152.21	50	6826.0	7263.41	505.77	7159.66	7177.50	85.96	9.55	0.16	9.56
15000	92.39	156.99	50	6824.0	7284.91	460.65	7181.09	7195.85	86.33	9.55	0.12	9.56
15050	92.43	161.77	50	6821.9	7302.58	413.91	7198.67	7210.56	86.71	9.55	0.08	9.56
15100	92.46	166.55	50	6819.7	7316.30	365.87	7212.30	7221.58	87.10	9.55	0.06	9.56
15150	92.46	171.33	50	6817.6	7325.96	316.86	7221.88	7228.83	87.49	9.55	0.00	9.56
15200	92.46	176.12	50	6815.5	7331.51	267.22	7227.34	7232.28	87.88	9.57	0.00	9.58
15250	92.43	180.90	50	6813.3	7332.89	217.29	7228.64	7231.91	88.28	9.55	-0.06	9.56
15300	92.39	185.68	50	6811.2	7330.11	167.43	7225.78	7227.71	88.67	9.55	-0.08	9.56
15350	92.33	190.46	50	6809.2	7323.19	117.98	7218.76	7219.73	89.06	9.55	-0.12	9.56
15400	92.26	195.24	50	6807.2	7312.17	69.29	7207.66	7207.99	89.45	9.55	-0.14	9.56
15450	92.17	200.02	50	6805.2	7297.12	21.69	7192.53	7192.56	89.83	9.55	-0.18	9.56
15500	92.06	204.80	50	6803.4	7278.16	-24.49	7173.49	7173.53	90.20	9.56	-0.22	9.56
15550	91.94	209.58	50	6801.6	7255.41	-68.93	7150.66	7150.99	90.55	9.56	-0.24	9.56
15597	91.82	214.07	47	6800.1	7230.72	-108.83	7125.89	7126.72	90.87	9.55	-0.26	9.55
15600	91.81	214.36	3	6800.0	7229.03	-111.31	7124.21	7125.08	90.90	9.67	-0.33	9.67
15650	91.66	219.13	50	6798.5	7199.21	-151.34	7094.32	7095.93	91.22	9.54	-0.30	9.54
15700	91.50	223.91	50	6797.1	7166.16	-188.75	7061.20	7063.72	91.53	9.56	-0.32	9.56
15750	91.34	228.69	50	6795.9	7130.09	-223.28	7025.07	7028.62	91.82	9.56	-0.32	9.56
15800	91.16	233.46	50	6794.8	7091.27	-254.68	6986.19	6990.83	92.09	9.54	-0.36	9.54
15850	90.97	238.24	50	6793.8	7049.96	-282.73	6944.83	6950.58	92.33	9.57	-0.38	9.56
15869	90.90	240.05	19	6793.5	7033.75	-292.42	6928.61	6934.78	92.42	9.58	-0.37	9.58
15900	90.78	243.01	31	6793.1	7006.44	-307.24	6901.28	6908.11	92.55	9.52	-0.39	9.52
15950	90.59	247.78	50	6792.5	6961.04	-328.06	6855.83	6863.68	92.74	9.55	-0.38	9.54
16000	90.38	252.56	50	6792.0	6914.05	-345.01	6808.81	6817.55	92.90	9.57	-0.42	9.56
16050	90.18	257.33	50	6791.8	6865.80	-357.99	6760.54	6770.02	93.03	9.55	-0.40	9.54
16100	89.97	262.10	50	6791.7	6816.63	-366.92	6711.36	6721.38	93.13	9.55	-0.42	9.54
16150	89.77	266.88	50	6791.9	6766.89	-371.72	6661.61	6671.97	93.19	9.57	-0.40	9.56
16183	89.64	270.00	33	6792.0	6734.21	-372.61	6628.92	6639.39	93.22	9.55	-0.40	9.54
16193	89.46	270.10	10	6792.1	6724.21	-372.60	6618.92	6629.40	93.22	2.06	-1.80	1.00
16200	89.46	270.10	7	6792.2	6716.91	-372.59	6611.62	6622.11	93.23	0.00	0.00	0.00
16300	89.46	270.10	100	6793.1	6616.91	-372.41	6511.63	6522.27	93.27	0.00	0.00	0.00
16355	89.46	270.10	55	6793.6	6561.51	-372.32	6456.23	6466.96	93.30	0.00	0.00	0.00
16400	89.46	270.10	45	6794.1	6516.92	-372.24	6411.63	6422.43	93.32	0.00	0.00	0.00
16500	89.46	270.10	100	6795.0	6416.92	-372.06	6311.64	6322.59	93.37	0.00	0.00	0.00
16600	89.46	270.10	100	6795.9	6316.92	-371.89	6211.64	6222.76	93.43	0.00	0.00	0.00
16700	89.46	270.10	100	6796.9	6216.93	-371.71	6111.65	6122.94	93.48	0.00	0.00	0.00
16800	89.46	270.10	100	6797.8	6116.93	-371.54	6011.65	6023.12	93.54	0.00	0.00	0.00
16801	89.46	270.10	1	6797.8	6116.33	-371.54	6011.05	6022.52	93.54	0.00	0.00	0.00
16813	89.46	270.10	12	6797.9	6104.13	-371.52	5998.85	6010.35	93.54	0.00	0.00	0.00
16900	89.46	270.10	87	6798.8	6016.94	-371.37	5911.66	5923.31	93.59	0.00	0.00	0.00
17000	89.46	270.10	100	6799.7	5916.94	-371.19	5811.66	5823.50	93.65	0.00	0.00	0.00
17100	89.46	270.10	100	6800.7	5816.95	-371.02	5711.67	5723.70	93.72	0.00	0.00	0.00
17200	89.46	270.10	100	6801.6	5716.95	-370.84	5611.67	5623.91	93.78	0.00	0.00	0.00
17300	89.46	270.10	100	6802.5	5616.96	-370.67	5511.67	5524.12	93.85	0.00	0.00	0.00

# Minimum Radius of Curvature

**API: 51-23-51801**      **Well: Hens 06NHS**      **Wellhead Location N+/S- : 40.328210**  
**Operator: PDC Energy**      **Area: DJ**      **E+/W- : -104.572340**  
**Rig:**      **Type: U-Lateral**      **Magnetic Declination: 7.76**  
**TD: 23,209'**      **Plane of Proposal: 90.10**

Measured Depth Ft	Drift Angle Deg	Azimuth Direction Deg	Course Length Ft	TVD Ft	Vertical Section Ft	COORDINATES		CLOSURE		Dog Leg Severity Deg/100'	Build / Drop Deg/100'	Left / Right Deg/100'
						N-S Ft	E-W Ft	Distance FT	Direction Deg			
17388	89.46	270.10	88	6803.4	5529.46	-370.51	5424.18	5436.82	93.91	0.00	0.00	0.00
17400	89.46	270.10	13	6803.5	5516.96	-370.49	5411.68	5424.35	93.92	0.00	0.00	0.00
17500	89.46	270.10	100	6804.4	5416.96	-370.32	5311.68	5324.58	93.99	0.00	0.00	0.00
17600	89.46	270.10	100	6805.4	5316.97	-370.14	5211.69	5224.82	94.06	0.00	0.00	0.00
17632	89.46	270.10	32	6805.7	5284.67	-370.09	5179.39	5192.60	94.09	0.00	0.00	0.00
17662	89.46	270.10	30	6805.9	5255.07	-370.04	5149.79	5163.07	94.11	0.00	0.00	0.00
17700	89.46	270.10	38	6806.3	5216.97	-369.97	5111.69	5125.06	94.14	0.00	0.00	0.00
17800	89.46	270.10	100	6807.2	5116.98	-369.79	5011.70	5025.32	94.22	0.00	0.00	0.00
17900	89.46	270.10	100	6808.2	5016.98	-369.62	4911.70	4925.59	94.30	0.00	0.00	0.00
18000	89.46	270.10	100	6809.1	4916.99	-369.45	4811.71	4825.87	94.39	0.00	0.00	0.00
18100	89.46	270.10	100	6810.1	4816.99	-369.27	4711.71	4726.16	94.48	0.00	0.00	0.00
18200	89.46	270.10	100	6811.0	4717.00	-369.10	4611.72	4626.46	94.58	0.00	0.00	0.00
18300	89.46	270.10	100	6812.0	4617.00	-368.92	4511.72	4526.78	94.67	0.00	0.00	0.00
18400	89.46	270.10	100	6812.9	4517.00	-368.75	4411.73	4427.11	94.78	0.00	0.00	0.00
18500	89.46	270.10	100	6813.8	4417.01	-368.57	4311.73	4327.45	94.89	0.00	0.00	0.00
18600	89.46	270.10	100	6814.8	4317.01	-368.40	4211.73	4227.82	95.00	0.00	0.00	0.00
18700	89.46	270.10	100	6815.7	4217.02	-368.22	4111.74	4128.19	95.12	0.00	0.00	0.00
18745	89.46	270.10	45	6816.2	4172.32	-368.15	4067.04	4083.67	95.17	0.00	0.00	0.00
18791	89.46	270.10	46	6816.6	4126.42	-368.07	4021.14	4037.95	95.23	0.00	0.00	0.00
18800	89.46	270.10	9	6816.7	4117.02	-368.05	4011.74	4028.59	95.24	0.00	0.00	0.00
18900	89.46	270.10	100	6817.6	4017.03	-367.88	3911.75	3929.01	95.37	0.00	0.00	0.00
19000	89.46	270.10	100	6818.6	3917.03	-367.70	3811.75	3829.45	95.51	0.00	0.00	0.00
19100	89.46	270.10	100	6819.5	3817.04	-367.53	3711.76	3729.91	95.65	0.00	0.00	0.00
19200	89.46	270.10	100	6820.4	3717.04	-367.35	3611.76	3630.40	95.81	0.00	0.00	0.00
19300	89.46	270.10	100	6821.4	3617.04	-367.18	3511.77	3530.91	95.97	0.00	0.00	0.00
19400	89.46	270.10	100	6822.3	3517.05	-367.00	3411.77	3431.45	96.14	0.00	0.00	0.00
19453	89.46	270.10	53	6822.8	3464.35	-366.91	3359.07	3379.05	96.23	0.00	0.00	0.00
19470	89.46	270.10	18	6823.0	3446.75	-366.88	3341.47	3361.55	96.27	0.00	0.00	0.00
19500	89.46	270.10	30	6823.3	3417.05	-366.83	3311.78	3332.03	96.32	0.00	0.00	0.00
19531	89.46	270.10	31	6823.6	3385.65	-366.77	3280.38	3300.82	96.38	0.00	0.00	0.00
19600	89.46	270.10	69	6824.2	3317.06	-366.65	3211.78	3232.64	96.51	0.00	0.00	0.00
19700	89.46	270.10	100	6825.2	3217.06	-366.48	3111.78	3133.29	96.72	0.00	0.00	0.00
19800	89.46	270.10	100	6826.1	3117.07	-366.30	3011.79	3033.98	96.93	0.00	0.00	0.00
19900	89.46	270.10	100	6827.0	3017.07	-366.13	2911.79	2934.72	97.17	0.00	0.00	0.00
19919	89.46	270.10	19	6827.2	2998.17	-366.10	2892.89	2915.97	97.21	0.00	0.00	0.00
20000	89.46	270.10	81	6828.0	2917.08	-365.96	2811.80	2835.51	97.42	0.00	0.00	0.00
20100	89.46	270.10	100	6828.9	2817.08	-365.78	2711.80	2736.36	97.68	0.00	0.00	0.00
20116	89.46	270.10	16	6829.1	2800.68	-365.75	2695.40	2720.11	97.73	0.00	0.00	0.00
20200	89.46	270.10	84	6829.9	2717.08	-365.61	2611.81	2637.27	97.97	0.00	0.00	0.00
20300	89.46	270.10	100	6830.8	2617.09	-365.43	2511.81	2538.26	98.28	0.00	0.00	0.00
20400	89.46	270.10	100	6831.8	2517.09	-365.26	2411.82	2439.32	98.61	0.00	0.00	0.00
20500	89.46	270.10	100	6832.7	2417.10	-365.08	2311.82	2340.47	98.97	0.00	0.00	0.00
20600	89.46	270.10	100	6833.6	2317.10	-364.91	2211.83	2241.73	99.37	0.00	0.00	0.00
20700	89.46	270.10	100	6834.6	2217.11	-364.73	2111.83	2143.10	99.80	0.00	0.00	0.00
20800	89.46	270.10	100	6835.5	2117.11	-364.56	2011.84	2044.60	100.27	0.00	0.00	0.00
20900	89.46	270.10	100	6836.5	2017.12	-364.38	1911.84	1946.25	100.79	0.00	0.00	0.00
21000	89.46	270.10	100	6837.4	1917.12	-364.21	1811.84	1848.09	101.37	0.00	0.00	0.00
21013	89.46	270.10	13	6837.5	1904.52	-364.19	1799.25	1835.73	101.44	0.00	0.00	0.00
21100	89.46	270.10	87	6838.3	1817.12	-364.04	1711.85	1750.13	102.01	0.00	0.00	0.00
21105	89.46	270.10	5	6838.4	1811.92	-364.03	1706.65	1745.04	102.04	0.00	0.00	0.00
21200	89.46	270.10	95	6839.3	1717.13	-363.86	1611.85	1652.41	102.72	0.00	0.00	0.00
21220	89.46	270.10	20	6839.5	1697.43	-363.83	1592.15	1633.20	102.87	0.00	0.00	0.00
21300	89.46	270.10	80	6840.2	1617.13	-363.69	1511.86	1554.99	103.53	0.00	0.00	0.00
21400	89.46	270.10	100	6841.2	1517.14	-363.51	1411.86	1457.91	104.44	0.00	0.00	0.00
21500	89.46	270.10	100	6842.1	1417.14	-363.34	1311.87	1361.25	105.48	0.00	0.00	0.00
21600	89.46	270.10	100	6843.1	1317.15	-363.16	1211.87	1265.12	106.68	0.00	0.00	0.00
21700	89.46	270.10	100	6844.0	1217.15	-362.99	1111.88	1169.63	108.08	0.00	0.00	0.00
21800	89.46	270.10	100	6844.9	1117.16	-362.81	1011.88	1074.96	109.73	0.00	0.00	0.00



## Minimum Radius of Curvature

**API: 51-23-51801**      **Well: Hens 06NHS**      **Wellhead Location N+/S- : 40.328210**  
**Operator: PDC Energy**      **Area: DJ**      **E+/W- : -104.572340**  
**Rig:**      **Type: U-Lateral**      **Magnetic Declination: 7.76**  
**TD: 23,209'**      **Plane of Proposal: 90.10**

Measured Depth Ft	Drift Angle Deg	Azimuth Direction Deg	Course Length Ft	TVD Ft	Vertical Section Ft	COORDINATES		CLOSURE		Dog Leg Severity Deg/100'	Build / Drop Deg/100'	Left / Right Deg/100'
						N-S Ft	E-W Ft	Distance FT	Direction Deg			
21900	89.46	270.10	100	6845.9	1017.16	-362.64	911.89	981.35	111.69	0.00	0.00	0.00
22000	89.46	270.10	100	6846.8	917.16	-362.46	811.89	889.13	114.06	0.00	0.00	0.00
22100	89.46	270.10	100	6847.8	817.17	-362.29	711.90	798.78	116.97	0.00	0.00	0.00
22200	89.46	270.10	100	6848.7	717.17	-362.12	611.90	711.02	120.62	0.00	0.00	0.00
22300	89.46	270.10	100	6849.7	617.18	-361.94	511.90	626.93	125.26	0.00	0.00	0.00
22400	89.46	270.10	100	6850.6	517.18	-361.77	411.91	548.22	131.29	0.00	0.00	0.00
22500	89.46	270.10	100	6851.5	417.19	-361.59	311.91	477.53	139.22	0.00	0.00	0.00
22600	89.46	270.10	100	6852.5	317.19	-361.42	211.92	418.97	149.61	0.00	0.00	0.00
22700	89.46	270.10	100	6853.4	217.20	-361.24	111.92	378.18	162.79	0.00	0.00	0.00
22736	89.46	270.10	36	6853.8	181.60	-361.18	76.32	369.16	168.07	0.00	0.00	0.00
22776	89.46	270.10	40	6854.1	141.30	-361.11	36.03	362.90	174.30	0.00	0.00	0.00
22800	89.46	270.10	24	6854.4	117.20	-361.07	11.93	361.27	178.11	0.00	0.00	0.00
22900	89.46	270.10	100	6855.3	17.20	-360.89	-88.07	371.48	193.71	0.00	0.00	0.00
23000	89.46	270.10	100	6856.3	-82.79	-360.72	-188.06	406.80	207.54	0.00	0.00	0.00
23100	89.46	270.10	100	6857.2	-182.79	-360.54	-288.06	461.49	218.62	0.00	0.00	0.00
23209	89.46	270.10	109	6858.2	-291.78	-360.35	-397.05	536.20	227.77	0.00	0.00	0.00