



Company: Anadarko Petroleum Corp.
Lease / Well: Opatril 12-9 L
County/Parish: WELD
State: COLORADO
Date: 11/5/2014
Rig: NA
Surveyor: SHON LANE
Job Number: 515-512316250
Instrument Number: 4015 **Type:** MEMORY
Proposed Direction: 0 **GL Elev:** 4792
Magnetic Declination: 9.86 EAST TO TRUE NORTH
Calculation Method: MINIMUM OF CURVATURE
Log Measured From: GL

TIE-IN Coordinates

Measured Depth (ft.)	Inclination	Azimuth Bearing	Vertical Depth	Coordinates (+N/-S)	Coordinates (+E/-W)
0	0.00	0.00	0.00	0.00	0.00

Directional Survey Report

Measured Depth (ft.)	Inclination	Azimuth Bearing	Vertical Depth	Vertical Section	Coordinates (+N/-S)	Coordinates (+E/-W)	Dog-Leg / 100 ft.	Closure Distance	Closure Direction
100	0.31	43.17	100.00	0.20	0.20	0.19	0.31	0.27	43.17°
200	0.06	54.88	200.00	0.42	0.42	0.41	0.25	0.59	44.20°
300	0.83	213.69	300.00	-0.15	-0.15	0.05	0.89	0.16	159.91°
400	1.88	227.70	399.97	-1.85	-1.85	-1.56	1.09	2.42	220.09°
500	2.76	237.45	499.88	-4.25	-4.25	-4.80	0.96	6.42	228.47°
600	2.89	233.32	599.76	-7.06	-7.06	-8.85	0.24	11.32	231.45°
700	2.95	235.62	699.63	-10.01	-10.01	-13.00	0.13	16.41	232.39°
800	2.84	237.39	799.51	-12.80	-12.80	-17.21	0.14	21.45	233.36°
900	2.74	238.25	899.39	-15.39	-15.39	-21.33	0.11	26.31	234.18°
1000	2.65	238.48	999.28	-17.86	-17.86	-25.33	0.09	31.00	234.81°
1100	2.49	236.96	1099.18	-20.25	-20.25	-29.13	0.17	35.48	235.18°
1200	2.22	237.92	1199.09	-22.47	-22.47	-32.59	0.27	39.58	235.42°
1300	2.02	239.58	1299.02	-24.39	-24.39	-35.75	0.21	43.27	235.70°
1400	1.87	241.33	1398.96	-26.06	-26.06	-38.70	0.16	46.66	236.04°
1500	1.75	241.67	1498.91	-27.57	-27.57	-41.47	0.12	49.80	236.39°
1600	1.94	245.86	1598.86	-28.99	-28.99	-44.36	0.23	52.99	236.84°
1700	1.87	245.68	1698.81	-30.35	-30.35	-47.40	0.07	56.28	237.36°
1800	1.63	252.97	1798.76	-31.44	-31.44	-50.24	0.33	59.27	237.96°
1900	1.65	261.13	1898.72	-32.08	-32.08	-53.02	0.23	61.97	238.83°
2000	1.69	307.01	1998.68	-31.41	-31.41	-55.62	1.30	63.88	240.54°
2100	1.94	328.33	2098.63	-29.08	-29.08	-57.69	0.71	64.61	243.24°
2200	2.49	337.18	2198.56	-25.64	-25.64	-59.42	0.65	64.72	246.66°
2300	3.07	348.90	2298.44	-21.01	-21.01	-60.78	0.81	64.31	250.93°
2400	3.63	353.12	2398.27	-15.24	-15.24	-61.67	0.61	63.53	256.12°
2500	3.63	353.47	2498.07	-8.95	-8.95	-62.41	0.02	63.05	261.84°
2600	3.77	353.82	2597.86	-2.54	-2.54	-63.13	0.14	63.18	267.70°
2700	3.42	353.01	2697.66	3.69	3.69	-63.84	0.35	63.95	273.31°
2800	3.22	353.51	2797.50	9.44	9.44	-64.52	0.20	65.21	278.32°
2900	3.14	353.87	2897.34	14.95	14.95	-65.13	0.08	66.83	282.93°
3000	3.15	354.25	2997.19	20.41	20.41	-65.70	0.02	68.80	287.26°
3100	3.04	354.34	3097.05	25.78	25.78	-66.24	0.11	71.08	291.27°
3200	3.01	356.54	3196.91	31.04	31.04	-66.66	0.12	73.53	294.97°
3300	2.97	358.37	3296.77	36.25	36.25	-66.89	0.10	76.08	298.46°
3400	3.08	358.69	3396.63	41.53	41.53	-67.03	0.11	78.85	301.78°
3500	3.45	6.31	3496.47	47.20	47.20	-66.76	0.57	81.76	305.26°
3600	3.74	8.90	3596.27	53.42	53.42	-65.92	0.33	84.85	309.02°
3700	3.93	15.76	3696.05	59.94	59.94	-64.49	0.50	88.04	312.91°
3800	3.99	15.13	3795.81	66.59	66.59	-62.65	0.07	91.43	316.75°
3900	3.95	16.02	3895.57	73.26	73.26	-60.79	0.07	95.20	320.32°
4000	3.46	14.71	3995.36	79.49	79.49	-59.07	0.50	99.04	323.38°
4100	2.66	359.57	4095.22	84.73	84.73	-58.32	1.13	102.86	325.46°
4200	1.68	351.93	4195.15	88.50	88.50	-58.55	1.02	106.12	326.51°
4300	1.20	348.05	4295.11	90.98	90.98	-58.97	0.49	108.42	327.05°
4400	0.96	329.62	4395.10	92.73	92.73	-59.61	0.42	110.23	327.26°
4500	1.01	325.95	4495.08	94.18	94.18	-60.53	0.08	111.95	327.27°
4600	0.48	303.64	4595.07	95.14	95.14	-61.37	0.59	113.22	327.18°
4700	0.53	296.35	4695.07	95.58	95.58	-62.13	0.08	114.00	326.97°
4800	0.45	291.43	4795.07	95.93	95.93	-62.91	0.09	114.72	326.74°

Directional Survey Report

Measured Depth (ft.)	Inclination	Azimuth Bearing	Vertical Depth	Vertical Section	Coordinates		Dog-Leg / 100 ft.	Closure Distance	Closure Direction
					(+N/-S)	(+E/-W)			
4900	0.31	286.40	4895.06	96.15	96.15	-63.54	0.14	115.25	326.54°
5000	0.29	268.38	4995.06	96.22	96.22	-64.05	0.10	115.59	326.35°
5100	0.28	279.84	5095.06	96.25	96.25	-64.54	0.06	115.89	326.16°
5200	0.08	231.08	5195.06	96.25	96.25	-64.84	0.24	116.05	326.03°
5300	0.28	215.23	5295.06	96.01	96.01	-65.03	0.20	115.96	325.89°
5400	0.38	207.25	5395.06	95.51	95.51	-65.33	0.11	115.72	325.63°
5500	0.50	160.66	5495.06	94.81	94.81	-65.33	0.37	115.14	325.43°
5600	0.69	160.38	5595.05	93.83	93.83	-64.99	0.19	114.13	325.29°
5700	0.71	160.69	5695.04	92.67	92.67	-64.58	0.02	112.96	325.13°
5800	1.75	160.70	5795.02	90.65	90.65	-63.87	1.04	110.89	324.83°
5900	1.44	178.76	5894.98	87.95	87.95	-63.34	0.59	108.38	324.24°
6000	1.19	193.31	5994.95	85.68	85.68	-63.55	0.42	106.68	323.44°
6100	0.95	205.25	6094.94	83.92	83.92	-64.14	0.33	105.63	322.61°
6200	0.96	225.91	6194.92	82.59	82.59	-65.10	0.34	105.16	321.75°
6300	0.79	233.49	6294.91	81.60	81.60	-66.25	0.21	105.11	320.92°
6400	0.65	232.89	6394.90	80.85	80.85	-67.26	0.14	105.17	320.24°
6500	0.88	221.58	6494.89	79.93	79.93	-68.22	0.27	105.09	319.52°
6600	1.02	227.30	6594.88	78.75	78.75	-69.39	0.17	104.96	318.62°
6700	1.12	212.55	6694.86	77.32	77.32	-70.57	0.29	104.68	317.62°
6800	1.35	210.16	6794.84	75.48	75.48	-71.68	0.24	104.10	316.48°
6900	1.94	206.78	6894.80	72.95	72.95	-73.04	0.60	103.23	314.97°
7000	2.47	206.33	6994.72	69.51	69.51	-74.76	0.53	102.08	312.92°
7100	1.96	209.22	7094.65	66.09	66.09	-76.55	0.52	101.13	310.81°

Directional Survey Report

Measured Depth (ft.)	Inclination	Azimuth Bearing	Vertical Depth	Vertical Section	Coordinates (+N/-S)	(+E/-W)	Dog-Leg / 100 ft.	Closure Distance	Closure Direction
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Directional Survey Report

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Directional Survey Report

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Directional Survey Report

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					(+N/-S)	(+E/-W)			

Directional Survey Report

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