



Company: Anadarko Petroleum Corp.
Lease / Well: Frank 14-31
County/Parish: WELD
State: COLORADO
Date: 10/15/2014
Rig: NA
Surveyor: JOHN RIDDLE
Job Number: 444-512327400
Instrument Number: 4015 **Type:** MEMORY
Proposed Direction: 0 **GL Elev:** 4930
Magnetic Declination 9.92 EAST TO TRUE NORTH
Calulation Method: MINIMUM OF CURVATURE
Log Measured From: GL

TIE-IN Coordinates

Measured Depth (ft.)	Inclination	Azimuth Bearing	Vertical Depth	Coordinates	
				(+N/-S)	(+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	0.22	248.53	100.00	-0.07	-0.07	-0.18	0.22	0.19	248.53°
200	0.24	265.91	200.00	-0.16	-0.16	-0.57	0.07	0.59	254.65°
300	0.30	263.13	300.00	-0.20	-0.20	-1.04	0.06	1.05	258.97°
400	0.35	237.70	400.00	-0.40	-0.40	-1.55	0.15	1.60	255.69°
500	0.26	221.70	499.99	-0.73	-0.73	-1.96	0.12	2.09	249.62°
600	0.43	220.47	599.99	-1.18	-1.18	-2.36	0.17	2.64	243.33°
700	0.43	222.56	699.99	-1.75	-1.75	-2.85	0.02	3.35	238.55°
800	0.64	237.98	799.99	-2.32	-2.32	-3.58	0.25	4.27	237.09°
900	0.78	239.27	899.98	-2.96	-2.96	-4.64	0.14	5.50	237.45°
1000	0.75	239.31	999.97	-3.64	-3.64	-5.79	0.03	6.84	237.81°
1100	0.92	247.04	1099.96	-4.29	-4.29	-7.09	0.20	8.29	238.82°
1200	0.90	250.35	1199.95	-4.87	-4.87	-8.57	0.06	9.86	240.40°
1300	0.92	243.21	1299.93	-5.49	-5.49	-10.03	0.12	11.43	241.27°
1400	0.91	245.39	1399.92	-6.19	-6.19	-11.46	0.04	13.03	241.64°
1500	1.00	247.67	1499.91	-6.85	-6.85	-12.99	0.10	14.69	242.20°
1600	0.93	245.58	1599.89	-7.52	-7.52	-14.54	0.08	16.37	242.66°
1700	0.91	245.67	1699.88	-8.18	-8.18	-16.00	0.02	17.97	242.93°
1800	0.92	260.69	1799.87	-8.64	-8.64	-17.52	0.24	19.53	243.76°
1900	1.12	264.31	1899.85	-8.86	-8.86	-19.28	0.21	21.22	245.31°
2000	1.44	267.75	1999.83	-9.01	-9.01	-21.51	0.33	23.32	247.28°
2100	1.33	262.83	2099.80	-9.20	-9.20	-23.92	0.16	25.63	248.95°
2200	1.60	249.10	2199.76	-9.85	-9.85	-26.37	0.44	28.15	249.53°
2300	1.78	243.54	2299.72	-11.04	-11.04	-29.07	0.24	31.09	249.21°
2400	1.66	242.63	2399.68	-12.39	-12.39	-31.74	0.12	34.08	248.67°
2500	1.82	242.24	2499.63	-13.80	-13.80	-34.44	0.16	37.10	248.16°
2600	1.62	249.58	2599.58	-15.03	-15.03	-37.17	0.30	40.09	247.98°
2700	1.08	251.56	2699.56	-15.82	-15.82	-39.38	0.54	42.44	248.11°
2800	1.10	254.70	2799.54	-16.37	-16.37	-41.20	0.06	44.34	248.33°
2900	1.15	260.05	2899.52	-16.80	-16.80	-43.12	0.12	46.28	248.71°
3000	1.27	267.80	2999.50	-17.02	-17.02	-45.21	0.20	48.31	249.37°
3100	1.59	272.86	3099.47	-16.99	-16.99	-47.71	0.34	50.64	250.40°
3200	1.74	269.39	3199.42	-16.94	-16.94	-50.61	0.18	53.37	251.50°
3300	1.83	264.77	3299.38	-17.10	-17.10	-53.72	0.17	56.37	252.34°
3400	1.58	260.62	3399.33	-17.47	-17.47	-56.67	0.28	59.30	252.87°
3500	1.52	260.52	3499.29	-17.91	-17.91	-59.34	0.06	61.98	253.20°
3600	1.47	266.91	3599.26	-18.20	-18.20	-61.93	0.17	64.55	253.62°
3700	1.57	265.66	3699.23	-18.37	-18.37	-64.57	0.11	67.14	254.12°
3800	1.52	264.82	3799.19	-18.60	-18.60	-67.26	0.05	69.78	254.54°
3900	1.36	268.43	3899.16	-18.75	-18.75	-69.77	0.18	72.24	254.96°
4000	0.98	282.72	3999.14	-18.59	-18.59	-71.79	0.48	74.16	255.48°
4100	0.84	298.11	4099.12	-18.06	-18.06	-73.27	0.28	75.46	256.15°
4200	0.67	315.70	4199.12	-17.30	-17.30	-74.32	0.29	76.31	256.90°
4300	0.61	309.28	4299.11	-16.54	-16.54	-75.14	0.09	76.94	257.59°
4400	0.52	302.46	4399.10	-15.96	-15.96	-75.94	0.11	77.60	258.13°
4500	0.52	303.40	4499.10	-15.47	-15.47	-76.70	0.01	78.24	258.60°
4600	0.65	292.15	4599.09	-15.00	-15.00	-77.60	0.17	79.04	259.06°
4700	0.67	295.88	4699.09	-14.53	-14.53	-78.66	0.05	79.99	259.53°
4800	0.87	294.28	4799.08	-13.97	-13.97	-79.87	0.20	81.09	260.08°

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	0.81	287.88	4899.07	-13.44	-13.44	-81.24	0.11	82.34	260.61°
5000	0.68	282.77	4999.06	-13.09	-13.09	-82.49	0.15	83.52	260.98°
5100	0.81	271.61	5099.05	-12.94	-12.94	-83.78	0.19	84.77	261.22°
5200	0.82	254.90	5199.04	-13.10	-13.10	-85.17	0.24	86.18	261.25°
5300	0.83	255.63	5299.03	-13.47	-13.47	-86.57	0.01	87.61	261.16°
5400	0.88	245.05	5399.02	-13.97	-13.97	-87.96	0.17	89.07	260.97°
5500	1.03	226.08	5499.01	-14.92	-14.92	-89.31	0.35	90.55	260.51°
5600	0.70	278.89	5599.00	-15.45	-15.45	-90.56	0.82	91.87	260.32°
5700	0.65	289.22	5698.99	-15.17	-15.17	-91.70	0.13	92.94	260.61°
5800	0.55	301.87	5798.98	-14.73	-14.73	-92.64	0.17	93.80	260.97°
5900	0.39	287.75	5898.98	-14.37	-14.37	-93.37	0.20	94.47	261.25°
6000	0.27	276.42	5998.98	-14.24	-14.24	-93.93	0.14	95.00	261.38°
6100	0.29	244.23	6098.98	-14.33	-14.33	-94.39	0.16	95.47	261.37°
6200	0.42	238.17	6198.98	-14.63	-14.63	-94.93	0.14	96.05	261.24°
6300	0.38	226.68	6298.97	-15.05	-15.05	-95.48	0.09	96.66	261.04°
6400	0.40	230.46	6398.97	-15.50	-15.50	-95.99	0.03	97.24	260.83°
6500	0.38	229.14	6498.97	-15.94	-15.94	-96.51	0.02	97.82	260.62°
6600	0.49	229.78	6598.97	-16.43	-16.43	-97.09	0.11	98.47	260.39°
6700	0.46	223.64	6698.96	-17.00	-17.00	-97.70	0.06	99.16	260.13°
6800	0.49	212.55	6798.96	-17.65	-17.65	-98.20	0.10	99.78	259.81°
6900	0.42	207.69	6898.96	-18.33	-18.33	-98.60	0.08	100.29	259.47°
7000	0.55	213.28	6998.95	-19.06	-19.06	-99.04	0.14	100.85	259.11°
7100	0.43	227.03	7098.95	-19.72	-19.72	-99.57	0.17	101.51	258.80°
7200	0.11	186.43	7198.95	-20.07	-20.07	-99.86	0.35	101.86	258.64°

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