



Job Number: SVGJ-141252
 Company: PDC
 Lease/Well: Pigeon 5-JAN
 Location: Weld County, CO
 Rig Name: MS Energy Wireline
 RKB: 0'
 G.L. or M.S.L.: GL

State/Country: Colorado/USA
 Declination: 8.32°
 Grid: East To True North
 File name: S:\2014SU-1\PDC\GJ\PIGEON\5JAN.SVY
 Date/Time: 15-Oct-14 / 10:46
 Curve Name: Surface - 6800' M.D. (Rate Gyro)

MS SURVEY

WINSERVE SURVEY CALCULATIONS

Minimum Curvature Method

Vertical Section Plane .00

Vertical Section Referenced to Wellhead

Rectangular Coordinates Referenced to Wellhead

<i>Measured Depth FT</i>	<i>Incl Angle Deg</i>	<i>Drift Direction Deg</i>	<i>True Vertical Depth</i>	<i>N-S FT</i>	<i>E-W FT</i>	<i>Vertical Section FT</i>	<i>C L O S U R E</i>		<i>Dogleg Severity Deg/100</i>
							<i>Distance FT</i>	<i>Direction Deg</i>	
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
100.00	.36	65.90	100.00	.13	.29	.13	.31	65.90	.36
200.00	.19	20.50	200.00	.41	.63	.41	.75	56.89	.26
300.00	.08	281.90	300.00	.58	.62	.58	.85	46.89	.22
400.00	.14	308.18	400.00	.67	.46	.67	.81	34.24	.08
500.00	.11	36.16	500.00	.82	.42	.82	.92	26.86	.17
600.00	.23	21.67	600.00	1.09	.55	1.09	1.22	26.74	.13
700.00	.20	355.42	700.00	1.45	.61	1.45	1.57	22.78	.10
800.00	.28	321.09	800.00	1.81	.44	1.81	1.87	13.67	.16
900.00	.27	273.37	899.99	2.02	.05	2.02	2.02	1.49	.22

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	N-S FT	E-W FT	Vertical Section FT	C L O S U R E		Dogleg Severity Deg/100
							Distance FT	Direction Deg	
1000.00	.31	262.47	999.99	2.00	-.45	2.00	2.05	347.27	.07
1100.00	.20	273.21	1099.99	1.97	-.89	1.97	2.16	335.60	.12
1200.00	.38	302.82	1199.99	2.16	-1.35	2.16	2.54	328.06	.23
1300.00	.42	276.80	1299.99	2.38	-1.99	2.38	3.10	320.14	.18
1400.00	.19	216.87	1399.99	2.29	-2.45	2.29	3.36	313.08	.36
1500.00	.19	131.58	1499.99	2.05	-2.43	2.05	3.18	310.18	.26
1600.00	.15	95.15	1599.99	1.93	-2.17	1.93	2.91	311.59	.11
1700.00	.15	68.14	1699.99	1.97	-1.92	1.97	2.75	315.65	.07
1800.00	.15	56.44	1799.99	2.09	-1.69	2.09	2.69	320.98	.03
1900.00	.23	34.44	1899.99	2.32	-1.47	2.32	2.75	327.72	.11
2000.00	.37	15.59	1999.98	2.80	-1.27	2.80	3.07	335.64	.17
2100.00	.49	.40	2099.98	3.54	-1.18	3.54	3.73	341.59	.16
2200.00	.26	308.54	2199.98	4.11	-1.35	4.11	4.33	341.78	.39
2300.00	.42	269.46	2299.98	4.25	-1.90	4.25	4.65	335.93	.27
2400.00	.72	257.28	2399.97	4.10	-2.88	4.10	5.01	324.98	.32
2500.00	.79	244.36	2499.96	3.67	-4.11	3.67	5.51	311.75	.18
2600.00	.86	237.52	2599.95	2.97	-5.37	2.97	6.13	298.94	.12
2700.00	.85	237.19	2699.94	2.16	-6.62	2.16	6.97	288.08	.01
2800.00	.91	241.82	2799.93	1.39	-7.95	1.39	8.06	279.89	.09
2900.00	1.08	246.00	2899.92	.63	-9.51	.63	9.53	273.77	.18
3000.00	1.20	247.64	2999.90	-.15	-11.34	-.15	11.34	269.22	.12
3100.00	1.29	245.88	3099.87	-1.01	-13.33	-1.01	13.37	265.65	.10
3200.00	1.24	246.31	3199.85	-1.91	-15.35	-1.91	15.47	262.91	.05
3300.00	1.50	255.85	3299.82	-2.66	-17.61	-2.66	17.81	261.40	.35
3400.00	1.44	264.26	3399.79	-3.11	-20.13	-3.11	20.37	261.22	.22
3500.00	1.45	273.69	3499.75	-3.15	-22.64	-3.15	22.86	262.07	.24
3600.00	1.52	271.49	3599.72	-3.04	-25.23	-3.04	25.41	263.14	.09
3700.00	1.67	263.95	3699.68	-3.16	-28.00	-3.16	28.18	263.57	.26
3800.00	1.83	258.29	3799.64	-3.63	-31.02	-3.63	31.23	263.32	.24

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	N-S FT	E-W FT	Vertical Section FT	C L O S U R E		Dogleg Severity Deg/100
							Distance FT	Direction Deg	
3900.00	1.80	258.48	3899.59	-4.27	-34.12	-4.27	34.39	262.86	.03
4000.00	1.23	271.98	3999.55	-4.55	-36.73	-4.55	37.01	262.94	.67
4100.00	1.07	285.89	4099.53	-4.25	-38.70	-4.25	38.94	263.73	.32
4200.00	1.18	305.79	4199.51	-3.40	-40.44	-3.40	40.58	265.20	.40
4300.00	1.41	317.23	4299.49	-1.89	-42.11	-1.89	42.15	267.43	.34
4400.00	.90	319.77	4399.47	-.39	-43.45	-.39	43.45	269.49	.51
4500.00	1.17	111.05	4499.46	-.16	-43.00	-.16	43.00	269.79	2.01
4600.00	.95	102.22	4599.44	-.70	-41.24	-.70	41.25	269.03	.27
4700.00	.96	94.14	4699.43	-.93	-39.59	-.93	39.61	268.65	.13
4800.00	.98	85.02	4799.41	-.92	-37.91	-.92	37.92	268.61	.16
4900.00	.99	84.01	4899.40	-.76	-36.20	-.76	36.20	268.80	.02
5000.00	.95	86.24	4999.39	-.61	-34.51	-.61	34.51	268.98	.05
5100.00	.95	90.84	5099.37	-.57	-32.85	-.57	32.86	269.01	.08
5200.00	.86	123.35	5199.36	-.99	-31.40	-.99	31.41	268.19	.51
5300.00	1.04	125.71	5299.35	-1.94	-30.03	-1.94	30.10	266.31	.18
5400.00	1.08	118.57	5399.33	-2.92	-28.47	-2.92	28.62	264.15	.14
5500.00	1.33	90.86	5499.31	-3.38	-26.48	-3.38	26.70	262.72	.63
5600.00	1.48	84.78	5599.28	-3.28	-24.03	-3.28	24.26	262.22	.21
5700.00	1.50	87.14	5699.24	-3.10	-21.44	-3.10	21.66	261.77	.06
5800.00	1.59	82.70	5799.21	-2.86	-18.76	-2.86	18.97	261.33	.15
5900.00	1.71	81.77	5899.17	-2.47	-15.90	-2.47	16.10	261.17	.12
6000.00	1.99	84.98	5999.11	-2.10	-12.70	-2.10	12.87	260.59	.30
6100.00	2.33	84.45	6099.04	-1.76	-8.95	-1.76	9.12	258.89	.34
6200.00	2.39	79.19	6198.96	-1.17	-4.87	-1.17	5.01	256.52	.22
6300.00	2.15	69.83	6298.88	-.13	-1.07	-.13	1.07	263.00	.44
6400.00	1.89	86.45	6398.82	.62	2.34	.62	2.42	75.21	.64
6500.00	1.64	97.59	6498.77	.53	5.41	.53	5.43	84.39	.42
6600.00	1.36	119.57	6598.74	-.24	7.86	-.24	7.86	91.78	.63
6700.00	1.62	133.67	6698.70	-1.81	9.91	-1.81	10.07	100.32	.45

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	N-S FT	E-W FT	Vertical Section FT	C L O S U R E		Dogleg Severity Deg/100
							Distance FT	Direction Deg	
Last Survey Depth Recorded									
6800.00	1.55	138.57	6798.67	-3.80	11.83	-3.80	12.42	107.79	.15