



Job Number: SVGJ-141425
 Company: PDC
 Lease/Well: State Lease 8461 21-16
 Location: Weld County, CO
 Rig Name: MS Energy Wireline
 RKB: 0'
 G.L. or M.S.L.: GL

State/Country: Colorado/USA
 Declination: 8.23°
 Grid: East To True North
 File name: S:\2014SU~1\PDC\GJ\STATE\LEASE\84612116.SVY
 Date/Time: 24-Dec-14 / 11:37
 Curve Name: Surface - 6900' 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	.37	137.53	100.00	-.24	.22	-.24	.32	137.53	.37
200.00	.31	163.01	200.00	-.74	.52	-.74	.90	144.98	.16
300.00	.06	123.94	300.00	-1.02	.64	-1.02	1.21	148.07	.27
400.00	.12	163.91	400.00	-1.15	.71	-1.15	1.35	148.37	.08
500.00	.06	227.20	500.00	-1.29	.70	-1.29	1.47	151.47	.11
600.00	.05	129.26	600.00	-1.35	.70	-1.35	1.52	152.76	.08
700.00	.09	190.31	700.00	-1.46	.72	-1.46	1.62	153.84	.08
800.00	.09	275.89	800.00	-1.53	.62	-1.53	1.65	157.78	.12
900.00	.33	256.37	900.00	-1.59	.27	-1.59	1.61	170.50	.25

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	.32	273.19	999.99	-1.64	-.29	-1.64	1.66	190.14	.10
1100.00	.41	263.73	1099.99	-1.66	-.93	-1.66	1.90	209.17	.11
1200.00	.44	253.95	1199.99	-1.81	-1.65	-1.81	2.45	222.44	.08
1300.00	.58	261.51	1299.99	-1.99	-2.52	-1.99	3.21	231.75	.16
1400.00	.76	256.68	1399.98	-2.22	-3.67	-2.22	4.29	238.86	.19
1500.00	.70	257.71	1499.97	-2.50	-4.91	-2.50	5.51	243.03	.06
1600.00	.73	253.50	1599.96	-2.81	-6.12	-2.81	6.73	245.33	.06
1700.00	.79	252.02	1699.95	-3.20	-7.38	-3.20	8.05	246.55	.06
1800.00	.80	248.70	1799.94	-3.67	-8.69	-3.67	9.43	247.11	.05
1900.00	.71	238.40	1899.94	-4.25	-9.87	-4.25	10.74	246.71	.16
2000.00	.81	255.71	1999.93	-4.75	-11.08	-4.75	12.06	246.81	.25
2100.00	.88	257.15	2099.92	-5.09	-12.51	-5.09	13.51	247.86	.07
2200.00	.77	246.43	2199.91	-5.53	-13.88	-5.53	14.94	248.27	.19
2300.00	.76	242.45	2299.90	-6.11	-15.08	-6.11	16.27	247.96	.05
2400.00	.88	222.23	2399.89	-6.98	-16.19	-6.98	17.63	246.67	.31
2500.00	.99	204.77	2499.87	-8.34	-17.07	-8.34	18.99	243.97	.30
2600.00	.90	185.43	2599.86	-9.90	-17.50	-9.90	20.11	240.50	.33
2700.00	.71	187.47	2699.85	-11.30	-17.66	-11.30	20.96	237.39	.19
2800.00	.53	176.24	2799.84	-12.37	-17.71	-12.37	21.60	235.05	.22
2900.00	.55	165.45	2899.84	-13.30	-17.56	-13.30	22.02	232.85	.10
3000.00	.47	175.33	2999.84	-14.17	-17.40	-14.17	22.44	230.84	.12
3100.00	.67	245.71	3099.83	-14.82	-17.90	-14.82	23.24	230.38	.68
3200.00	1.01	253.83	3199.82	-15.31	-19.28	-15.31	24.62	231.55	.36
3300.00	1.06	250.08	3299.81	-15.87	-21.00	-15.87	26.32	232.92	.08
3400.00	1.30	240.97	3399.78	-16.73	-22.86	-16.73	28.33	233.79	.30
3500.00	1.37	242.56	3499.76	-17.84	-24.91	-17.84	30.64	234.40	.08
3600.00	1.37	236.58	3599.73	-19.05	-26.97	-19.05	33.02	234.77	.14
3700.00	1.48	208.38	3699.70	-20.84	-28.58	-20.84	35.37	233.90	.70
3800.00	1.59	206.20	3799.66	-23.22	-29.81	-23.22	37.79	232.08	.12

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	1.65	205.57	3899.62	-25.76	-31.04	-25.76	40.34	230.31	.06
4000.00	1.73	205.56	3999.58	-28.42	-32.31	-28.42	43.04	228.66	.08
4100.00	1.76	204.67	4099.53	-31.18	-33.61	-31.18	45.84	227.14	.04
4200.00	1.59	202.69	4199.49	-33.86	-34.78	-33.86	48.54	225.77	.18
4300.00	1.22	208.02	4299.46	-36.08	-35.82	-36.08	50.84	224.79	.39
4400.00	.91	215.56	4399.44	-37.66	-36.78	-37.66	52.64	224.32	.34
4500.00	.76	222.34	4499.43	-38.80	-37.69	-38.80	54.09	224.17	.18
4600.00	.66	225.96	4599.42	-39.69	-38.55	-39.69	55.33	224.16	.11
4700.00	.44	231.30	4699.42	-40.33	-39.26	-40.33	56.29	224.23	.23
4800.00	.46	352.83	4799.42	-40.17	-39.61	-40.17	56.42	224.60	.79
4900.00	.75	356.48	4899.41	-39.12	-39.70	-39.12	55.74	225.42	.29
5000.00	.97	358.91	4999.40	-37.62	-39.76	-37.62	54.74	226.58	.22
5100.00	.87	331.68	5099.39	-36.11	-40.14	-36.11	53.99	228.03	.44
5200.00	.82	352.32	5199.38	-34.73	-40.59	-34.73	53.42	229.45	.31
5300.00	.26	173.39	5299.38	-34.25	-40.66	-34.25	53.16	229.90	1.08
5400.00	.18	163.28	5399.37	-34.62	-40.59	-34.62	53.35	229.54	.09
5500.00	.54	150.39	5499.37	-35.18	-40.31	-35.18	53.50	228.89	.37
5600.00	1.01	107.69	5599.36	-35.86	-39.24	-35.86	53.16	227.58	.71
5700.00	.99	135.09	5699.35	-36.74	-37.79	-36.74	52.70	225.81	.47
5800.00	.97	159.51	5799.33	-38.14	-36.88	-38.14	53.06	224.04	.41
5900.00	1.05	165.61	5899.32	-39.82	-36.36	-39.82	53.92	222.40	.13
6000.00	1.04	156.88	5999.30	-41.55	-35.78	-41.55	54.83	220.73	.16
6100.00	1.10	146.48	6099.29	-43.18	-34.89	-43.18	55.51	218.94	.20
6200.00	1.17	146.74	6199.27	-44.83	-33.80	-44.83	56.15	217.01	.07
6300.00	1.42	144.26	6299.24	-46.69	-32.52	-46.69	56.90	214.85	.26
6400.00	1.64	138.30	6399.20	-48.77	-30.84	-48.77	57.70	212.31	.27
6500.00	1.97	131.11	6499.15	-50.97	-28.59	-50.97	58.44	209.29	.40
6600.00	1.78	121.51	6599.10	-52.91	-25.97	-52.91	58.94	206.15	.37
6700.00	1.39	109.98	6699.06	-54.13	-23.51	-54.13	59.02	203.47	.50

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	
6800.00	1.27	94.01	6799.04	-54.63	-21.26	-54.63	58.62	201.27	.39
Last Survey Depth Recorded									
6900.00	.64	105.47	6899.02	-54.85	-19.62	-54.85	58.26	199.68	.66