



Job Number: SVGJ-140587
 Company: PDC
 Lease/Well: Churchill 28A-1
 Location: Weld County, CO
 Rig Name: MS Energy Wireline
 RKB: 0'
 G.L. or M.S.L.: GL

State/Country: Colorado/USA
 Declination: 8.36°
 Grid: East To True North
 File name: S:\2014SU~1\PDC\GJ\CHURCH~1\28A1.SVY
 Date/Time: 16-May-14 / 17:03
 Curve Name: Surface - 6500' 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	.45	66.61	100.00	.16	.36	.16	.39	66.61	.45
200.00	.11	34.30	200.00	.39	.77	.39	.87	63.22	.36
300.00	.15	135.64	300.00	.38	.92	.38	.99	67.74	.20
400.00	.17	41.47	400.00	.39	1.11	.39	1.18	70.45	.23
500.00	.20	41.97	500.00	.64	1.33	.64	1.47	64.39	.03
600.00	.10	134.33	600.00	.70	1.50	.70	1.66	64.92	.23
700.00	.20	149.47	700.00	.49	1.66	.49	1.73	73.42	.11
800.00	.49	104.45	799.99	.24	2.16	.24	2.17	83.77	.38
900.00	.45	130.92	899.99	-.13	2.87	-.13	2.87	92.56	.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	.33	148.30	999.99	-.63	3.32	-.63	3.38	100.76	.17
1100.00	.24	70.80	1099.99	-.81	3.67	-.81	3.75	102.41	.36
1200.00	.15	307.85	1199.99	-.66	3.76	-.66	3.82	99.91	.35
1300.00	.31	354.70	1299.99	-.31	3.63	-.31	3.65	94.84	.23
1400.00	.45	3.07	1399.98	.35	3.63	.35	3.65	84.43	.15
1500.00	.47	16.61	1499.98	1.14	3.77	1.14	3.94	73.18	.11
1600.00	.43	45.32	1599.98	1.80	4.15	1.80	4.52	66.60	.23
1700.00	.27	70.86	1699.98	2.14	4.64	2.14	5.11	65.27	.22
1800.00	.04	65.22	1799.98	2.23	4.89	2.23	5.38	65.52	.23
1900.00	.34	58.01	1899.98	2.40	5.18	2.40	5.71	65.12	.30
2000.00	.06	130.29	1999.97	2.52	5.47	2.52	6.02	65.23	.33
2100.00	.19	114.47	2099.97	2.42	5.66	2.42	6.16	66.84	.13
2200.00	.10	188.12	2199.97	2.27	5.80	2.27	6.23	68.65	.19
2300.00	.28	294.11	2299.97	2.28	5.56	2.28	6.01	67.72	.32
2400.00	.38	298.58	2399.97	2.54	5.05	2.54	5.65	63.31	.10
2500.00	.38	282.78	2499.97	2.77	4.43	2.77	5.23	58.01	.10
2600.00	.47	306.51	2599.97	3.09	3.78	3.09	4.88	50.77	.20
2700.00	.56	309.60	2699.96	3.64	3.08	3.64	4.77	40.17	.09
2800.00	.59	307.60	2799.96	4.27	2.29	4.27	4.84	28.22	.04
2900.00	.58	300.84	2899.95	4.84	1.45	4.84	5.05	16.65	.07
3000.00	.55	313.45	2999.95	5.43	.67	5.43	5.47	6.98	.13
3100.00	.43	322.46	3099.94	6.06	.09	6.06	6.06	.83	.14
3200.00	.58	304.61	3199.94	6.64	-.56	6.64	6.67	355.21	.22
3300.00	.57	277.83	3299.94	7.00	-1.47	7.00	7.15	348.17	.27
3400.00	.42	265.32	3399.93	7.04	-2.32	7.04	7.41	341.72	.18
3500.00	.30	269.49	3499.93	7.01	-2.95	7.01	7.60	337.15	.12
3600.00	.10	220.80	3599.93	6.94	-3.27	6.94	7.67	334.76	.25
3700.00	.07	147.31	3699.93	6.82	-3.29	6.82	7.57	334.22	.10
3800.00	.24	2.85	3799.93	6.98	-3.25	6.98	7.70	335.02	.30

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	.28	317.86	3899.93	7.37	-3.40	7.37	8.12	335.20	.20
4000.00	.74	327.72	3999.92	8.09	-3.91	8.09	8.99	334.20	.47
4100.00	.96	338.97	4099.91	9.42	-4.56	9.42	10.47	334.18	.28
4200.00	1.08	346.43	4199.90	11.12	-5.08	11.12	12.23	335.45	.18
4300.00	1.43	344.42	4299.87	13.24	-5.64	13.24	14.39	336.94	.35
4400.00	1.17	353.10	4399.85	15.45	-6.09	15.45	16.61	338.48	.33
4500.00	1.10	357.00	4499.83	17.43	-6.27	17.43	18.52	340.22	.10
4600.00	.88	5.12	4599.81	19.15	-6.25	19.15	20.14	341.93	.26
4700.00	.61	110.77	4699.81	19.73	-5.68	19.73	20.53	343.93	1.20
4800.00	2.10	152.47	4799.78	17.91	-4.34	17.91	18.43	346.39	1.69
4900.00	2.05	155.15	4899.71	14.66	-2.74	14.66	14.92	349.42	.11
5000.00	1.96	161.35	4999.65	11.42	-1.44	11.42	11.51	352.81	.23
5100.00	1.57	166.77	5099.60	8.47	-.58	8.47	8.49	356.08	.42
5200.00	1.21	152.79	5199.58	6.19	.22	6.19	6.20	1.99	.49
5300.00	1.08	161.32	5299.56	4.36	1.00	4.36	4.48	12.91	.21
5400.00	.43	105.76	5399.55	3.37	1.66	3.37	3.76	26.28	.91
5500.00	1.06	191.78	5499.54	2.36	1.84	2.36	2.99	37.86	1.12
5600.00	1.08	184.17	5599.52	.52	1.58	.52	1.66	71.91	.14
5700.00	.65	168.98	5699.51	-.98	1.62	-.98	1.89	121.23	.48
5800.00	.75	197.82	5799.50	-2.16	1.53	-2.16	2.65	144.77	.36
5900.00	1.17	226.92	5899.49	-3.48	.58	-3.48	3.53	170.54	.63
6000.00	1.30	211.39	5999.47	-5.15	-.76	-5.15	5.20	188.36	.36
6100.00	1.52	172.66	6099.44	-7.43	-1.18	-7.43	7.52	189.01	.96
6200.00	1.29	204.41	6199.41	-9.77	-1.47	-9.77	9.88	188.58	.80
6300.00	1.90	209.49	6299.37	-12.24	-2.75	-12.24	12.55	192.68	.63
6400.00	2.84	224.90	6399.29	-15.44	-5.32	-15.44	16.33	199.01	1.13
Last Survey Depth Recorded									
6500.00	4.15	236.33	6499.10	-19.20	-10.08	-19.20	21.68	207.70	1.48