



Job Number: SVGJ-140886
 Company: PDC
 Lease/Well: Roskop 29-1
 Location: Weld County, CO
 Rig Name: MS Energy Wireline
 RKB: 0'
 G.L. or M.S.L.: GL

State/Country: Colorado/USA
 Declination: 8.34°
 Grid: East To True North
 File name: S:\2014SU-1\PDC\GJ\ROSKOP\291.SVY
 Date/Time: 17-Jul-14 / 16:49
 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	.53	149.49	100.00	-.40	.23	-.40	.46	149.49	.53
200.00	.46	186.50	200.00	-1.20	.42	-1.20	1.27	160.47	.32
300.00	.09	125.62	299.99	-1.64	.44	-1.64	1.70	164.90	.42
400.00	.11	278.19	399.99	-1.67	.41	-1.67	1.72	166.18	.19
500.00	.37	175.62	499.99	-1.98	.34	-1.98	2.01	170.23	.41
600.00	.27	220.20	599.99	-2.48	.21	-2.48	2.49	175.08	.26
700.00	.11	339.30	699.99	-2.57	.03	-2.57	2.57	179.38	.34
800.00	.19	13.57	799.99	-2.32	.03	-2.32	2.32	179.20	.12
900.00	.22	288.97	899.99	-2.10	-.11	-2.10	2.10	183.00	.28

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	.25	199.16	999.99	-2.24	-.36	-2.24	2.27	189.20	.33
1100.00	.32	90.89	1099.99	-2.45	-.16	-2.45	2.46	183.63	.46
1200.00	.24	358.76	1199.99	-2.25	.12	-2.25	2.25	176.97	.41
1300.00	.23	332.34	1299.99	-1.86	.02	-1.86	1.86	179.34	.11
1400.00	.24	257.89	1399.99	-1.73	-.28	-1.73	1.75	189.10	.28
1500.00	.38	108.46	1499.99	-1.88	-.17	-1.88	1.88	185.08	.60
1600.00	.57	92.67	1599.98	-2.00	.64	-2.00	2.10	162.16	.23
1700.00	.45	65.72	1699.98	-1.87	1.50	-1.87	2.39	141.20	.26
1800.00	.51	107.10	1799.98	-1.83	2.28	-1.83	2.93	128.79	.34
1900.00	1.06	113.66	1899.97	-2.34	3.56	-2.34	4.25	123.31	.56
2000.00	.76	120.64	1999.95	-3.05	4.97	-3.05	5.83	121.48	.32
2100.00	1.29	120.62	2099.94	-3.96	6.51	-3.96	7.62	121.28	.53
2200.00	1.25	130.46	2199.91	-5.24	8.31	-5.24	9.82	122.22	.22
2300.00	.88	117.19	2299.90	-6.30	9.82	-6.30	11.67	122.66	.44
2400.00	1.30	130.68	2399.88	-7.39	11.37	-7.39	13.56	123.02	.49
2500.00	.84	126.29	2499.86	-8.56	12.82	-8.56	15.41	123.74	.47
2600.00	1.25	137.61	2599.84	-9.80	14.14	-9.80	17.21	124.72	.46
2700.00	.71	132.98	2699.83	-11.03	15.33	-11.03	18.89	125.72	.55
2800.00	1.06	126.38	2799.82	-12.00	16.53	-12.00	20.43	125.97	.36
2900.00	.60	131.78	2899.80	-12.90	17.67	-12.90	21.87	126.13	.47
3000.00	.64	138.98	2999.80	-13.67	18.42	-13.67	22.94	126.57	.09
3100.00	.81	116.77	3099.79	-14.41	19.42	-14.41	24.18	126.57	.33
3200.00	.97	118.75	3199.78	-15.13	20.79	-15.13	25.72	126.04	.16
3300.00	.86	117.32	3299.77	-15.88	22.20	-15.88	27.30	125.58	.11
3400.00	.28	69.62	3399.76	-16.14	23.10	-16.14	28.18	124.95	.70
3500.00	.32	130.21	3499.76	-16.24	23.54	-16.24	28.60	124.60	.30
3600.00	.58	68.20	3599.76	-16.23	24.22	-16.23	29.16	123.82	.51
3700.00	.63	111.03	3699.75	-16.24	25.21	-16.24	29.99	122.79	.44
3800.00	.12	147.02	3799.75	-16.52	25.78	-16.52	30.62	122.66	.54

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	.35	63.19	3899.75	-16.47	26.11	-16.47	30.87	122.25	.36
4000.00	.16	178.83	3999.75	-16.48	26.38	-16.48	31.11	121.99	.44
4100.00	.46	92.69	4099.75	-16.64	26.79	-16.64	31.53	121.84	.48
4200.00	.54	165.99	4199.74	-17.11	27.30	-17.11	32.22	122.08	.60
4300.00	.46	165.81	4299.74	-17.96	27.51	-17.96	32.86	123.13	.08
4400.00	.53	96.80	4399.74	-18.40	28.07	-18.40	33.57	123.25	.56
4500.00	.03	102.56	4499.74	-18.46	28.56	-18.46	34.00	122.88	.50
4600.00	.55	114.06	4599.73	-18.66	29.02	-18.66	34.50	122.75	.52
4700.00	.12	357.58	4699.73	-18.75	29.45	-18.75	34.92	122.49	.61
4800.00	.49	117.83	4799.73	-18.85	29.83	-18.85	35.28	122.29	.56
4900.00	.35	40.11	4899.73	-18.82	30.40	-18.82	35.75	121.75	.54
5000.00	.45	61.31	4999.73	-18.39	30.94	-18.39	36.00	120.73	.18
5100.00	.39	27.21	5099.73	-17.90	31.44	-17.90	36.18	119.65	.25
5200.00	.21	358.92	5199.72	-17.42	31.60	-17.42	36.08	118.86	.23
5300.00	.30	13.22	5299.72	-16.98	31.65	-16.98	35.92	118.21	.11
5400.00	.93	50.73	5399.72	-16.21	32.34	-16.21	36.18	116.62	.72
5500.00	.85	33.06	5499.70	-15.07	33.37	-15.07	36.62	114.31	.28
5600.00	1.14	69.61	5599.69	-14.11	34.71	-14.11	37.47	112.12	.68
5700.00	1.36	48.08	5699.67	-12.97	36.53	-12.97	38.76	109.54	.51
5800.00	1.49	46.44	5799.64	-11.28	38.35	-11.28	39.98	106.39	.14
5900.00	1.38	49.73	5899.61	-9.60	40.21	-9.60	41.34	103.43	.14
6000.00	1.26	26.40	5999.58	-7.84	41.62	-7.84	42.35	100.67	.55
6100.00	1.13	47.40	6099.56	-6.19	42.83	-6.19	43.28	98.22	.45
6200.00	.93	19.91	6199.54	-4.76	43.84	-4.76	44.09	96.19	.53
6300.00	1.24	15.47	6299.52	-2.95	44.40	-2.95	44.50	93.80	.32
6400.00	1.39	22.79	6399.50	-.79	45.16	-.79	45.17	91.00	.22
Last Survey Depth Recorded									
6500.00	1.25	21.58	6499.47	1.34	46.03	1.34	46.05	88.33	.14