



Job Number: SVGJ-140854  
 Company: PDC  
 Lease/Well: Miller 5  
 Location: Weld County, CO  
 Rig Name: MS Energy Wireline  
 RKB: 0'  
 G.L. or M.S.L.: GL

State/Country: Colorado/USA  
 Declination: 8.45°  
 Grid: East To True North  
 File name: S:\2014SU-1\PDC\GJ\MILLER\5.SVY  
 Date/Time: 11-Jul-14 / 16:18  
 Curve Name: Surface - 7300' 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	.73	278.94	100.00	.10	-.63	.10	.64	278.94	.73
200.00	.57	299.23	199.99	.44	-1.69	.44	1.75	284.60	.28
300.00	.43	278.26	299.99	.74	-2.50	.74	2.60	286.45	.23
400.00	.55	278.46	399.98	.86	-3.34	.86	3.45	284.46	.12
500.00	.66	243.93	499.98	.68	-4.34	.68	4.39	278.91	.37
600.00	.77	243.02	599.97	.12	-5.45	.12	5.45	271.28	.11
700.00	.89	254.70	699.96	-.39	-6.80	-.39	6.81	266.73	.21
800.00	.88	259.86	799.95	-.73	-8.31	-.73	8.34	264.99	.08
900.00	.75	281.53	899.94	-.73	-9.70	-.73	9.73	265.68	.33

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	.58	269.82	999.93	-.60	-10.85	-.60	10.87	266.82	.22
1100.00	.69	281.09	1099.93	-.49	-11.95	-.49	11.96	267.66	.17
1200.00	.72	256.64	1199.92	-.52	-13.15	-.52	13.16	267.74	.30
1300.00	.90	257.90	1299.91	-.83	-14.53	-.83	14.55	266.74	.18
1400.00	.96	262.52	1399.89	-1.10	-16.13	-1.10	16.16	266.09	.10
1500.00	.74	268.06	1499.88	-1.23	-17.60	-1.23	17.65	265.99	.23
1600.00	.77	276.74	1599.88	-1.18	-18.92	-1.18	18.95	266.44	.12
1700.00	.80	285.89	1699.87	-.91	-20.25	-.91	20.27	267.44	.13
1800.00	.94	289.54	1799.85	-.44	-21.70	-.44	21.70	268.84	.15
1900.00	.77	294.85	1899.84	.12	-23.08	.12	23.08	270.29	.19
2000.00	.29	226.21	1999.84	.22	-23.87	.22	23.87	270.54	.72
2100.00	.24	132.17	2099.84	-.09	-23.90	-.09	23.90	269.78	.39
2200.00	.34	192.96	2199.84	-.52	-23.81	-.52	23.82	268.74	.31
2300.00	.38	149.99	2299.84	-1.10	-23.71	-1.10	23.74	267.35	.27
2400.00	.47	161.06	2399.83	-1.77	-23.41	-1.77	23.48	265.67	.12
2500.00	.77	176.51	2499.83	-2.83	-23.24	-2.83	23.41	263.05	.34
2600.00	.57	152.02	2599.82	-3.94	-22.97	-3.94	23.30	260.26	.34
2700.00	.63	170.67	2699.81	-4.92	-22.64	-4.92	23.17	257.73	.20
2800.00	.55	171.80	2799.81	-5.94	-22.49	-5.94	23.26	255.20	.08
2900.00	.69	180.47	2899.80	-7.02	-22.42	-7.02	23.50	252.62	.17
3000.00	.42	202.93	2999.80	-7.96	-22.57	-7.96	23.93	250.58	.34
3100.00	.31	193.12	3099.80	-8.56	-22.77	-8.56	24.33	249.40	.13
3200.00	.63	188.96	3199.79	-9.37	-22.92	-9.37	24.76	247.78	.32
3300.00	.61	204.37	3299.79	-10.39	-23.23	-10.39	25.45	245.89	.17
3400.00	4.18	181.74	3399.69	-14.52	-23.56	-14.52	27.67	238.35	3.62
3500.00	4.65	183.77	3499.39	-22.21	-23.93	-22.21	32.65	227.14	.50
3600.00	2.20	194.19	3599.20	-28.12	-24.67	-28.12	37.41	221.27	2.52
3700.00	.71	230.59	3699.17	-30.37	-25.62	-30.37	39.73	220.15	1.68
3800.00	.44	349.38	3799.17	-30.39	-26.17	-30.39	40.10	220.74	1.00

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	.60	289.03	3899.16	-29.84	-26.74	-29.84	40.06	221.86	.54
4000.00	.86	313.58	3999.16	-29.15	-27.77	-29.15	40.26	223.62	.40
4100.00	1.08	297.58	4099.14	-28.20	-29.15	-28.20	40.56	225.96	.35
4200.00	.78	300.65	4199.13	-27.41	-30.57	-27.41	41.06	228.12	.30
4300.00	1.14	295.52	4299.11	-26.64	-32.06	-26.64	41.68	230.28	.37
4400.00	1.49	307.85	4399.09	-25.41	-33.98	-25.41	42.43	233.21	.45
4500.00	1.44	317.30	4499.05	-23.69	-35.86	-23.69	42.98	236.55	.25
4600.00	1.86	306.00	4599.01	-21.81	-38.03	-21.81	43.84	240.16	.53
4700.00	2.35	286.30	4698.95	-20.28	-41.31	-20.28	46.02	243.85	.87
4800.00	3.79	274.20	4798.80	-19.47	-46.57	-19.47	50.48	247.32	1.57
4900.00	3.63	270.88	4898.59	-19.18	-53.03	-19.18	56.39	250.12	.27
5000.00	3.63	272.88	4998.39	-18.97	-59.36	-18.97	62.32	252.28	.13
5100.00	3.19	278.66	5098.21	-18.39	-65.27	-18.39	67.81	254.27	.56
5200.00	3.11	271.29	5198.06	-17.91	-70.73	-17.91	72.97	255.79	.41
5300.00	2.85	266.24	5297.93	-18.01	-75.93	-18.01	78.03	256.65	.37
5400.00	2.86	271.41	5397.80	-18.11	-80.90	-18.11	82.90	257.38	.26
5500.00	2.38	256.27	5497.70	-18.55	-85.41	-18.55	87.40	257.75	.84
5600.00	1.76	253.25	5597.64	-19.48	-88.90	-19.48	91.01	257.64	.63
5700.00	1.33	269.32	5697.60	-19.94	-91.53	-19.94	93.68	257.71	.61
5800.00	.98	249.89	5797.58	-20.24	-93.49	-20.24	95.66	257.78	.52
5900.00	.66	278.48	5897.57	-20.45	-94.87	-20.45	97.05	257.83	.51
6000.00	1.14	291.86	5997.56	-20.00	-96.36	-20.00	98.41	258.28	.52
6100.00	1.33	283.75	6097.53	-19.35	-98.41	-19.35	100.30	258.87	.26
6200.00	.71	257.36	6197.52	-19.21	-100.14	-19.21	101.97	259.14	.76
6300.00	1.05	248.16	6297.51	-19.69	-101.60	-19.69	103.49	259.03	.37
6400.00	.86	248.18	6397.49	-20.31	-103.14	-20.31	105.13	258.86	.19
6500.00	1.65	243.06	6497.47	-21.24	-105.13	-21.24	107.25	258.58	.80
6600.00	1.60	237.27	6597.43	-22.65	-107.58	-22.65	109.94	258.11	.17
6700.00	1.55	258.64	6697.39	-23.67	-110.08	-23.67	112.60	257.87	.59

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	1.01	275.84	6797.37	-23.84	-112.29	-23.84	114.79	258.01	.66
6900.00	1.23	283.25	6897.35	-23.51	-114.21	-23.51	116.60	258.37	.26
7000.00	1.00	296.78	6997.33	-22.87	-116.03	-22.87	118.26	258.85	.35
7100.00	.98	280.85	7097.31	-22.32	-117.65	-22.32	119.75	259.26	.28
7200.00	.48	306.81	7197.30	-21.90	-118.83	-21.90	120.83	259.56	.59

Last Survey Depth Recorded									
7300.00	.63	340.12	7297.30	-21.14	-119.35	-21.14	121.20	259.96	.35