



Job Number: SVGJ-141298
 Company: PDC
 Lease/Well: McCarty 31-1
 Location: Weld County, CO
 Rig Name: MS Energy Wireline
 RKB: 0'
 G.L. or M.S.L.: GL

State/Country: Colorado/USA
 Declination: 8.40°
 Grid: East To True North
 File name: S:\2014SU~1\PDC\GJ\MCCARTY\311.SVY
 Date/Time: 07-Nov-14 / 11:30
 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	.37	305.78	100.00	.19	-.26	.19	.32	305.78	.37
200.00	.32	302.56	200.00	.53	-.76	.53	.92	304.81	.05
300.00	.31	290.77	300.00	.77	-1.25	.77	1.47	301.82	.07
400.00	.29	247.76	399.99	.77	-1.73	.77	1.90	294.05	.22
500.00	.45	248.69	499.99	.54	-2.33	.54	2.40	282.92	.16
600.00	.57	241.91	599.99	.16	-3.14	.16	3.14	272.90	.13
700.00	.70	237.24	699.98	-.41	-4.09	-.41	4.11	264.33	.14
800.00	.83	215.48	799.97	-1.33	-5.03	-1.33	5.20	255.22	.32
900.00	.65	202.59	899.97	-2.44	-5.66	-2.44	6.17	246.70	.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	
1000.00	.55	201.26	999.96	-3.41	-6.06	-3.41	6.95	240.61	.10
1100.00	.50	204.86	1099.96	-4.25	-6.41	-4.25	7.70	236.45	.06
1200.00	.44	228.58	1199.95	-4.90	-6.89	-4.90	8.45	234.54	.20
1300.00	.74	241.82	1299.95	-5.46	-7.74	-5.46	9.48	234.79	.33
1400.00	.81	239.27	1399.94	-6.13	-8.92	-6.13	10.82	235.50	.08
1500.00	.85	236.77	1499.93	-6.90	-10.15	-6.90	12.27	235.80	.05
1600.00	.84	226.11	1599.92	-7.81	-11.30	-7.81	13.73	235.34	.16
1700.00	.77	222.71	1699.91	-8.81	-12.28	-8.81	15.12	234.33	.08
1800.00	.66	217.29	1799.90	-9.77	-13.08	-9.77	16.33	233.27	.13
1900.00	.48	224.07	1899.89	-10.52	-13.72	-10.52	17.30	232.52	.19
2000.00	.46	248.02	1999.89	-10.98	-14.39	-10.98	18.10	232.66	.20
2100.00	.52	251.71	2099.89	-11.27	-15.19	-11.27	18.91	233.43	.07
2200.00	.72	257.43	2199.88	-11.55	-16.24	-11.55	19.92	234.58	.21
2300.00	.77	257.72	2299.87	-11.83	-17.51	-11.83	21.13	235.96	.05
2400.00	.90	253.28	2399.86	-12.20	-18.91	-12.20	22.51	237.19	.15
2500.00	.89	254.16	2499.85	-12.63	-20.41	-12.63	24.01	238.25	.02
2600.00	.81	248.24	2599.84	-13.11	-21.82	-13.11	25.45	239.00	.12
2700.00	.59	244.54	2699.83	-13.59	-22.94	-13.59	26.66	239.35	.22
2800.00	.37	273.89	2799.83	-13.79	-23.73	-13.79	27.44	239.83	.32
2900.00	.45	285.99	2899.83	-13.66	-24.43	-13.66	27.99	240.78	.12
3000.00	.62	289.67	2999.82	-13.37	-25.31	-13.37	28.63	242.16	.17
3100.00	.88	286.44	3099.81	-12.97	-26.56	-12.97	29.56	243.97	.26
3200.00	.95	277.00	3199.80	-12.65	-28.12	-12.65	30.83	245.77	.17
3300.00	.90	280.14	3299.79	-12.41	-29.71	-12.41	32.20	247.33	.07
3400.00	.91	278.91	3399.77	-12.15	-31.27	-12.15	33.55	248.76	.02
3500.00	.82	267.34	3499.76	-12.06	-32.77	-12.06	34.92	249.79	.20
3600.00	.85	252.48	3599.75	-12.32	-34.19	-12.32	36.34	250.19	.22
3700.00	.78	237.10	3699.74	-12.91	-35.47	-12.91	37.75	250.00	.23
3800.00	.74	234.55	3799.73	-13.66	-36.57	-13.66	39.04	249.52	.05

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	.72	242.04	3899.73	-14.32	-37.65	-14.32	40.28	249.17	.10
4000.00	.86	249.42	3999.72	-14.88	-38.91	-14.88	41.66	249.07	.17
4100.00	1.06	249.55	4099.70	-15.47	-40.48	-15.47	43.33	249.08	.20
4200.00	1.05	247.59	4199.68	-16.14	-42.19	-16.14	45.17	249.06	.04
4300.00	1.12	261.63	4299.67	-16.63	-44.00	-16.63	47.04	249.29	.27
4400.00	1.25	268.16	4399.65	-16.81	-46.06	-16.81	49.03	249.95	.19
4500.00	1.22	272.35	4499.62	-16.80	-48.22	-16.80	51.06	250.79	.10
4600.00	.99	284.16	4599.60	-16.55	-50.12	-16.55	52.78	251.73	.32
4700.00	.94	280.31	4699.59	-16.19	-51.76	-16.19	54.23	252.63	.08
4800.00	.83	274.48	4799.58	-15.99	-53.29	-15.99	55.64	253.30	.14
4900.00	.62	269.26	4899.57	-15.94	-54.55	-15.94	56.83	253.72	.22
5000.00	.74	273.31	4999.56	-15.91	-55.74	-15.91	57.96	254.07	.13
5100.00	.69	267.10	5099.56	-15.90	-56.98	-15.90	59.16	254.41	.09
5200.00	.49	268.02	5199.55	-15.95	-58.01	-15.95	60.16	254.63	.20
5300.00	.39	273.44	5299.55	-15.94	-58.78	-15.94	60.90	254.83	.11
5400.00	.45	290.06	5399.54	-15.78	-59.49	-15.78	61.55	255.14	.14
5500.00	.52	292.14	5499.54	-15.48	-60.28	-15.48	62.23	255.60	.07
5600.00	.60	298.19	5599.54	-15.06	-61.16	-15.06	62.99	256.17	.10
5700.00	.64	350.04	5699.53	-14.26	-61.72	-14.26	63.34	256.99	.54
5800.00	.78	334.56	5799.52	-13.10	-62.11	-13.10	63.47	258.09	.24
5900.00	.69	299.26	5899.52	-12.19	-62.93	-12.19	64.09	259.04	.45
6000.00	.43	313.05	5999.51	-11.64	-63.72	-11.64	64.78	259.65	.29
6100.00	.19	292.63	6099.51	-11.32	-64.15	-11.32	65.14	259.99	.26
6200.00	.70	237.09	6199.51	-11.59	-64.82	-11.59	65.85	259.86	.61
6300.00	.10	311.14	6299.50	-11.86	-65.40	-11.86	66.46	259.72	.68
6400.00	.11	242.17	6399.50	-11.85	-65.55	-11.85	66.61	259.75	.12
6500.00	.13	37.66	6499.50	-11.80	-65.56	-11.80	66.62	259.79	.23
6600.00	.10	71.71	6599.50	-11.69	-65.41	-11.69	66.45	259.87	.07
6700.00	.12	36.38	6699.50	-11.57	-65.27	-11.57	66.28	259.94	.07

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	.18	350.40	6799.50	-11.34	-65.23	-11.34	66.21	260.14	.13
6900.00	.25	348.96	6899.50	-10.97	-65.30	-10.97	66.21	260.47	.07
7000.00	.25	56.85	6999.50	-10.63	-65.16	-10.63	66.02	260.73	.28
7100.00	.21	283.64	7099.50	-10.47	-65.15	-10.47	65.99	260.87	.42
7200.00	.12	107.99	7199.50	-10.46	-65.23	-10.46	66.06	260.89	.33

Last Survey Depth Recorded									
7300.00	.23	68.30	7299.50	-10.42	-64.94	-10.42	65.77	260.89	.16