



Job Number: SVGJ-150009
 Company: PDC
 Lease/Well: Carlson 18-2
 Location: Weld County, CO
 Rig Name: MS Energy Wireline
 RKB: 0'
 G.L. or M.S.L.: GL

State/Country: Colorado/USA
 Declination: 8.57°
 Grid: East To True North
 File name: S:\2015SU~1\PDC\GJ\CARLSON\182.SVY
 Date/Time: 13-Jan-15 / 11:07
 Curve Name: Surface - 7100' 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	157.87	100.00	-.30	.12	-.30	.32	157.87	.37
200.00	.54	141.14	200.00	-.97	.54	-.97	1.11	150.82	.21
300.00	.37	176.57	299.99	-1.65	.85	-1.65	1.86	152.70	.32
400.00	.61	182.91	399.99	-2.51	.85	-2.51	2.65	161.36	.25
500.00	.41	195.42	499.99	-3.38	.72	-3.38	3.46	167.93	.23
600.00	.56	212.23	599.98	-4.14	.37	-4.14	4.16	174.92	.21
700.00	.38	204.49	699.98	-4.86	-.03	-4.86	4.86	180.35	.19
800.00	.36	241.12	799.98	-5.31	-.44	-5.31	5.33	184.76	.23
900.00	.56	246.62	899.97	-5.66	-1.17	-5.66	5.78	191.65	.20

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	.41	257.50	999.97	-5.93	-1.96	-5.93	6.25	198.33	.18
1100.00	.54	282.64	1099.97	-5.90	-2.77	-5.90	6.52	205.16	.24
1200.00	.46	263.31	1199.96	-5.85	-3.63	-5.85	6.88	211.84	.19
1300.00	.50	283.62	1299.96	-5.79	-4.45	-5.79	7.31	217.57	.17
1400.00	.46	265.94	1399.96	-5.72	-5.28	-5.72	7.78	222.72	.15
1500.00	.44	277.73	1499.95	-5.69	-6.06	-5.69	8.31	226.79	.09
1600.00	.62	278.68	1599.95	-5.56	-6.97	-5.56	8.92	231.44	.18
1700.00	.50	268.64	1699.94	-5.49	-7.95	-5.49	9.66	235.37	.15
1800.00	.52	282.13	1799.94	-5.40	-8.83	-5.40	10.35	238.52	.12
1900.00	.55	277.37	1899.94	-5.25	-9.75	-5.25	11.07	241.70	.05
2000.00	.39	302.05	1999.93	-5.00	-10.51	-5.00	11.64	244.54	.25
2100.00	.36	302.09	2099.93	-4.66	-11.06	-4.66	12.00	247.17	.03
2200.00	.14	289.19	2199.93	-4.45	-11.45	-4.45	12.28	248.75	.23
2300.00	.06	27.88	2299.93	-4.36	-11.54	-4.36	12.33	249.28	.16
2400.00	.14	190.38	2399.93	-4.44	-11.53	-4.44	12.36	248.96	.20
2500.00	.14	144.66	2499.93	-4.66	-11.49	-4.66	12.39	247.93	.11
2600.00	.25	146.13	2599.93	-4.94	-11.29	-4.94	12.33	246.38	.11
2700.00	.39	179.75	2699.93	-5.46	-11.17	-5.46	12.43	243.95	.23
2800.00	.57	179.53	2799.92	-6.30	-11.16	-6.30	12.82	240.58	.18
2900.00	.52	160.78	2899.92	-7.22	-11.01	-7.22	13.17	236.74	.18
3000.00	.44	189.72	2999.91	-8.03	-10.93	-8.03	13.56	233.69	.25
3100.00	.58	199.39	3099.91	-8.89	-11.16	-8.89	14.27	231.47	.16
3200.00	.43	202.66	3199.91	-9.71	-11.47	-9.71	15.03	229.76	.15
3300.00	.44	222.17	3299.90	-10.34	-11.87	-10.34	15.75	228.95	.15
3400.00	.56	213.33	3399.90	-11.03	-12.40	-11.03	16.60	228.34	.14
3500.00	.58	196.67	3499.90	-11.93	-12.81	-11.93	17.51	227.06	.17
3600.00	.63	204.88	3599.89	-12.91	-13.19	-12.91	18.46	225.62	.10
3700.00	.97	208.99	3699.88	-14.15	-13.83	-14.15	19.79	224.35	.34
3800.00	1.11	206.17	3799.86	-15.76	-14.67	-15.76	21.53	222.95	.15

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	.69	210.14	3899.85	-17.15	-15.40	-17.15	23.05	221.92	.42
4000.00	.39	222.89	3999.85	-17.92	-15.93	-17.92	23.98	221.64	.32
4100.00	.25	250.23	4099.84	-18.24	-16.37	-18.24	24.51	221.90	.20
4200.00	.14	259.07	4199.84	-18.34	-16.70	-18.34	24.80	222.31	.11
4300.00	.18	275.54	4299.84	-18.35	-16.97	-18.35	24.99	222.77	.06
4400.00	.20	268.48	4399.84	-18.34	-17.30	-18.34	25.21	223.34	.03
4500.00	.23	155.33	4499.84	-18.52	-17.39	-18.52	25.41	223.20	.36
4600.00	.25	117.45	4599.84	-18.81	-17.12	-18.81	25.43	222.31	.16
4700.00	.16	89.34	4699.84	-18.91	-16.78	-18.91	25.28	221.60	.13
4800.00	.21	166.45	4799.84	-19.08	-16.60	-19.08	25.29	221.02	.23
4900.00	.39	166.34	4899.84	-19.59	-16.48	-19.59	25.60	220.07	.18
5000.00	.36	205.16	4999.84	-20.21	-16.53	-20.21	26.11	219.29	.25
5100.00	.42	198.18	5099.84	-20.84	-16.78	-20.84	26.75	218.84	.08
5200.00	.54	203.52	5199.83	-21.62	-17.08	-21.62	27.55	218.31	.13
5300.00	.52	187.71	5299.83	-22.50	-17.33	-22.50	28.40	217.60	.15
5400.00	1.06	172.34	5399.82	-23.87	-17.27	-23.87	29.46	215.88	.58
5500.00	.66	154.96	5499.81	-25.31	-16.90	-25.31	30.43	213.74	.47
5600.00	.42	153.71	5599.80	-26.16	-16.49	-26.16	30.92	212.24	.24
5700.00	.47	137.38	5699.80	-26.79	-16.05	-26.79	31.23	210.94	.14
5800.00	.44	115.53	5799.80	-27.25	-15.43	-27.25	31.32	209.52	.17
5900.00	.23	126.67	5899.79	-27.54	-14.92	-27.54	31.32	208.45	.22
6000.00	.35	110.74	5999.79	-27.77	-14.48	-27.77	31.31	207.53	.14
6100.00	.27	86.91	6099.79	-27.86	-13.95	-27.86	31.16	206.60	.15
6200.00	.17	114.24	6199.79	-27.91	-13.58	-27.91	31.04	205.95	.14
6300.00	.18	75.41	6299.79	-27.93	-13.30	-27.93	30.94	205.46	.12
6400.00	.03	262.24	6399.79	-27.90	-13.17	-27.90	30.85	205.27	.21
6500.00	.12	183.98	6499.79	-28.00	-13.20	-28.00	30.96	205.24	.12
6600.00	.12	335.59	6599.79	-28.01	-13.25	-28.01	30.99	205.32	.23
6700.00	.10	277.31	6699.79	-27.91	-13.38	-27.91	30.95	205.62	.11

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	.30	320.84	6799.79	-27.69	-13.64	-27.69	30.87	206.22	.24
6900.00	.24	255.84	6899.79	-27.54	-14.00	-27.54	30.90	206.95	.29
7000.00	.14	85.68	6999.79	-27.58	-14.09	-27.58	30.97	207.05	.38
Last Survey Depth Recorded									
7100.00	.16	290.97	7099.79	-27.52	-14.09	-27.52	30.92	207.12	.29