



Job Number: SVGJ-141054
 Company: PDC
 Lease/Well: Owen 12-3
 Location: Weld County, CO
 Rig Name: MS Energy Wireline
 RKB: 0'
 G.L. or M.S.L.: GL

State/Country: Colorado/USA
 Declination: 8.52°
 Grid: East To True North
 File name: S:\2014SU-1\PDC\GJ\OWEN\123.SVY
 Date/Time: 28-Aug-14 / 14:20
 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	.26	298.62	100.00	.11	-.20	.11	.23	298.62	.26
200.00	.32	293.88	200.00	.33	-.65	.33	.73	296.82	.06
300.00	.15	264.02	300.00	.43	-1.04	.43	1.12	292.47	.20
400.00	.25	241.44	400.00	.31	-1.36	.31	1.40	282.91	.13
500.00	.34	212.96	500.00	-.04	-1.71	-.04	1.71	268.62	.17
600.00	.38	218.57	599.99	-.55	-2.08	-.55	2.15	255.21	.05
700.00	.40	215.44	699.99	-1.09	-2.49	-1.09	2.72	246.31	.03
800.00	.39	213.95	799.99	-1.66	-2.88	-1.66	3.33	240.08	.01
900.00	.38	217.14	899.99	-2.21	-3.27	-2.21	3.95	236.02	.02

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	.37	208.53	999.98	-2.75	-3.63	-2.75	4.56	232.80	.06
1100.00	.38	216.19	1099.98	-3.31	-3.98	-3.31	5.17	230.28	.05
1200.00	.36	220.57	1199.98	-3.81	-4.38	-3.81	5.81	228.96	.03
1300.00	.38	223.64	1299.98	-4.29	-4.81	-4.29	6.45	228.28	.03
1400.00	.38	221.11	1399.98	-4.78	-5.26	-4.78	7.11	227.73	.02
1500.00	.35	220.50	1499.97	-5.26	-5.68	-5.26	7.74	227.16	.03
1600.00	.48	227.74	1599.97	-5.78	-6.18	-5.78	8.46	226.95	.14
1700.00	.48	227.60	1699.97	-6.34	-6.80	-6.34	9.30	227.01	.00
1800.00	.61	218.58	1799.96	-7.04	-7.44	-7.04	10.25	226.60	.16
1900.00	.72	216.33	1899.96	-7.96	-8.15	-7.96	11.39	225.66	.11
2000.00	.70	213.78	1999.95	-8.98	-8.86	-8.98	12.61	224.63	.04
2100.00	.73	209.85	2099.94	-10.04	-9.52	-10.04	13.83	223.48	.06
2200.00	.59	194.01	2199.93	-11.09	-9.96	-11.09	14.90	221.93	.23
2300.00	.51	185.11	2299.93	-12.03	-10.12	-12.03	15.72	220.08	.12
2400.00	.50	182.08	2399.93	-12.91	-10.18	-12.91	16.44	218.25	.03
2500.00	.46	188.16	2499.92	-13.74	-10.25	-13.74	17.15	216.72	.06
2600.00	.41	204.02	2599.92	-14.47	-10.45	-14.47	17.85	215.85	.13
2700.00	.36	208.81	2699.92	-15.07	-10.75	-15.07	18.51	215.50	.06
2800.00	.35	215.16	2799.92	-15.59	-11.08	-15.59	19.13	215.39	.04
2900.00	.43	213.07	2899.91	-16.16	-11.46	-16.16	19.81	215.34	.08
3000.00	.53	202.92	2999.91	-16.90	-11.84	-16.90	20.64	215.02	.13
3100.00	.38	248.94	3099.91	-17.44	-12.33	-17.44	21.36	215.26	.38
3200.00	.50	301.94	3199.90	-17.33	-13.01	-17.33	21.67	216.90	.41
3300.00	.62	302.91	3299.90	-16.81	-13.84	-16.81	21.77	219.46	.12
3400.00	.94	307.33	3399.89	-16.02	-14.94	-16.02	21.91	223.02	.33
3500.00	1.34	302.93	3499.87	-14.88	-16.58	-14.88	22.28	228.08	.41
3600.00	1.39	301.53	3599.84	-13.61	-18.59	-13.61	23.04	233.79	.06
3700.00	1.39	301.67	3699.81	-12.34	-20.66	-12.34	24.07	239.14	.00
3800.00	1.20	304.50	3799.79	-11.11	-22.55	-11.11	25.14	243.77	.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	
3900.00	.99	308.98	3899.77	-9.98	-24.09	-9.98	26.07	247.50	.23
4000.00	.83	321.15	3999.76	-8.87	-25.21	-8.87	26.73	250.62	.25
4100.00	.65	330.70	4099.75	-7.81	-25.95	-7.81	27.10	253.25	.22
4200.00	.70	330.97	4199.74	-6.78	-26.52	-6.78	27.37	255.66	.05
4300.00	.58	312.27	4299.73	-5.91	-27.19	-5.91	27.83	257.74	.24
4400.00	.55	294.98	4399.73	-5.36	-28.00	-5.36	28.51	259.16	.17
4500.00	.53	270.73	4499.73	-5.15	-28.90	-5.15	29.35	259.89	.23
4600.00	.59	250.67	4599.72	-5.32	-29.85	-5.32	30.32	259.89	.20
4700.00	.56	248.20	4699.72	-5.67	-30.79	-5.67	31.30	259.56	.04
4800.00	.58	251.19	4799.71	-6.02	-31.72	-6.02	32.28	259.26	.04
4900.00	.50	244.74	4899.71	-6.37	-32.59	-6.37	33.21	258.95	.10
5000.00	.29	253.34	4999.70	-6.62	-33.23	-6.62	33.88	258.73	.22
5100.00	.25	254.52	5099.70	-6.75	-33.68	-6.75	34.35	258.66	.04
5200.00	.27	265.05	5199.70	-6.83	-34.13	-6.83	34.81	258.68	.05
5300.00	.33	248.07	5299.70	-6.96	-34.63	-6.96	35.32	258.63	.11
5400.00	.30	234.16	5399.70	-7.22	-35.11	-7.22	35.84	258.38	.08
5500.00	.14	164.54	5499.70	-7.49	-35.29	-7.49	36.08	258.01	.28
5600.00	.11	115.56	5599.70	-7.65	-35.17	-7.65	35.99	257.72	.11
5700.00	.08	51.16	5699.70	-7.65	-35.03	-7.65	35.85	257.68	.10
5800.00	.07	100.07	5799.70	-7.62	-34.91	-7.62	35.74	257.69	.06
5900.00	.08	338.23	5899.70	-7.56	-34.88	-7.56	35.69	257.77	.13
6000.00	.06	335.80	5999.70	-7.45	-34.93	-7.45	35.71	257.96	.02
6100.00	.12	332.38	6099.70	-7.31	-35.00	-7.31	35.75	258.20	.06
6200.00	.11	16.15	6199.70	-7.12	-35.02	-7.12	35.74	258.50	.09
6300.00	.11	7.04	6299.70	-6.94	-34.98	-6.94	35.66	258.78	.02
6400.00	.17	38.25	6399.70	-6.73	-34.88	-6.73	35.52	259.09	.09
6500.00	.34	355.27	6499.70	-6.31	-34.81	-6.31	35.38	259.72	.24
6600.00	.17	351.27	6599.69	-5.87	-34.86	-5.87	35.35	260.44	.17
6700.00	.14	17.99	6699.69	-5.61	-34.84	-5.61	35.29	260.86	.08

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	.27	33.97	6799.69	-5.30	-34.67	-5.30	35.07	261.31	.14
6900.00	.25	64.84	6899.69	-5.01	-34.34	-5.01	34.71	261.70	.14
7000.00	.45	101.84	6999.69	-5.00	-33.76	-5.00	34.13	261.58	.29
Last Survey Depth Recorded									
7100.00	.89	114.02	7099.68	-5.39	-32.67	-5.39	33.11	260.63	.46