



Job Number: SVGJ-131387
 Company: PDC
 Lease/Well: Hazen 21-33
 Location: Weld County, CO
 Rig Name: MS Energy Wireline
 RKB: 0'
 G.L. or M.S.L.: GL

State/Country: Colorado/USA
 Declination: 8.48°
 Grid: East To True North
 File name: S:\2013SU-1\PDC\GJ\HAZEN\2133.SVY
 Date/Time: 31-Dec-13 / 13:11
 Curve Name: Surface - 7100' M.D. (Rate Gyro)

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	.81	290.40	100.00	.25	-.66	.25	.71	290.40	.81
200.00	.58	202.22	199.99	.02	-1.52	.02	1.52	270.92	.98
300.00	.31	159.20	299.99	-.70	-1.61	-.70	1.76	246.61	.41
400.00	.78	260.68	399.99	-1.06	-2.19	-1.06	2.43	244.14	.89
500.00	.34	197.08	499.98	-1.45	-2.95	-1.45	3.29	243.73	.70
600.00	.72	299.27	599.98	-1.43	-3.58	-1.43	3.86	248.23	.86
700.00	1.01	259.38	699.97	-1.29	-5.00	-1.29	5.16	255.57	.65
800.00	.28	259.67	799.96	-1.49	-6.10	-1.49	6.28	256.26	.73
900.00	.48	298.18	899.96	-1.34	-6.71	-1.34	6.84	258.73	.31

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	.84	288.92	999.95	-.90	-7.77	-.90	7.83	263.38	.37
1100.00	1.15	263.50	1099.94	-.78	-9.47	-.78	9.50	265.30	.53
1200.00	1.03	237.29	1199.92	-1.38	-11.22	-1.38	11.30	263.00	.51
1300.00	.48	232.10	1299.91	-2.12	-12.31	-2.12	12.49	260.22	.55
1400.00	.72	286.89	1399.91	-2.20	-13.24	-2.20	13.42	260.58	.59
1500.00	.87	282.11	1499.90	-1.85	-14.58	-1.85	14.70	262.75	.16
1600.00	1.15	257.52	1599.88	-1.91	-16.30	-1.91	16.41	263.31	.51
1700.00	1.05	239.48	1699.86	-2.59	-18.07	-2.59	18.26	261.83	.36
1800.00	.97	231.09	1799.85	-3.59	-19.52	-3.59	19.85	259.58	.17
1900.00	.42	211.32	1899.84	-4.44	-20.37	-4.44	20.85	257.72	.59
2000.00	.28	257.64	1999.84	-4.80	-20.80	-4.80	21.34	257.00	.30
2100.00	1.22	278.13	2099.83	-4.70	-22.09	-4.70	22.59	257.98	.96
2200.00	1.46	261.90	2199.80	-4.73	-24.41	-4.73	24.86	259.03	.45
2300.00	1.60	253.42	2299.77	-5.31	-27.01	-5.31	27.52	258.88	.27
2400.00	1.14	251.43	2399.74	-6.02	-29.29	-6.02	29.90	258.38	.46
2500.00	1.02	278.90	2499.72	-6.20	-31.11	-6.20	31.72	258.72	.53
2600.00	1.35	287.98	2599.70	-5.70	-33.11	-5.70	33.60	260.23	.38
2700.00	1.16	261.38	2699.67	-5.49	-35.23	-5.49	35.65	261.14	.61
2800.00	.70	258.89	2799.66	-5.76	-36.83	-5.76	37.28	261.11	.46
2900.00	.82	261.53	2899.65	-5.98	-38.14	-5.98	38.60	261.08	.12
3000.00	.97	311.33	2999.64	-5.53	-39.48	-5.53	39.87	262.03	.77
3100.00	1.88	313.43	3099.61	-3.84	-41.31	-3.84	41.49	264.69	.91
3200.00	2.27	304.15	3199.54	-1.60	-44.14	-1.60	44.17	267.92	.51
3300.00	2.09	293.46	3299.47	.23	-47.45	.23	47.45	270.28	.44
3400.00	1.09	280.48	3399.43	1.13	-50.06	1.13	50.07	271.30	1.06
3500.00	.75	275.42	3499.42	1.37	-51.64	1.37	51.66	271.52	.35
3600.00	.53	297.87	3599.41	1.65	-52.70	1.65	52.73	271.79	.33
3700.00	.55	344.92	3699.41	2.33	-53.24	2.33	53.29	272.50	.43
3800.00	.57	109.23	3799.41	2.63	-52.89	2.63	52.96	272.84	.99

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	.48	12.58	3899.40	2.87	-52.33	2.87	52.41	273.14	.79
4000.00	.13	310.61	3999.40	3.35	-52.33	3.35	52.43	273.67	.43
4100.00	.35	161.20	4099.40	3.14	-52.31	3.14	52.41	273.43	.47
4200.00	.55	144.57	4199.40	2.46	-51.94	2.46	52.00	272.71	.24
4300.00	1.14	123.90	4299.39	1.51	-50.83	1.51	50.86	271.70	.65
4400.00	1.25	98.98	4399.37	.79	-48.93	.79	48.94	270.92	.53
4500.00	1.36	82.60	4499.34	.77	-46.68	.77	46.68	270.94	.39
4600.00	1.36	76.48	4599.31	1.20	-44.35	1.20	44.36	271.55	.15
4700.00	1.50	65.38	4699.28	2.02	-42.00	2.02	42.05	272.76	.31
4800.00	2.39	64.66	4799.22	3.46	-38.93	3.46	39.08	275.08	.89
4900.00	1.18	52.21	4899.17	4.98	-36.23	4.98	36.57	277.83	1.26
5000.00	.20	90.10	4999.17	5.61	-35.24	5.61	35.69	279.05	1.03
5100.00	.41	89.94	5099.16	5.61	-34.71	5.61	35.16	279.19	.21
5200.00	.27	84.96	5199.16	5.64	-34.12	5.64	34.58	279.38	.14
5300.00	.17	353.13	5299.16	5.80	-33.90	5.80	34.39	279.71	.32
5400.00	.53	249.13	5399.16	5.79	-34.35	5.79	34.83	279.56	.59
5500.00	.80	228.70	5499.15	5.16	-35.31	5.16	35.68	278.32	.36
5600.00	1.20	208.11	5599.14	3.78	-36.32	3.78	36.52	275.93	.53
5700.00	1.32	204.07	5699.11	1.80	-37.29	1.80	37.33	272.76	.15
5800.00	1.13	200.08	5799.09	-.18	-38.10	-.18	38.10	269.73	.21
5900.00	.87	210.61	5899.08	-1.76	-38.82	-1.76	38.86	267.41	.32
6000.00	.96	220.27	5999.06	-3.05	-39.75	-3.05	39.87	265.61	.18
6100.00	1.30	226.82	6099.04	-4.46	-41.12	-4.46	41.36	263.80	.36
6200.00	1.53	223.79	6199.01	-6.20	-42.87	-6.20	43.32	261.76	.24
6300.00	2.12	214.60	6298.96	-8.69	-44.84	-8.69	45.68	259.03	.66
6400.00	2.32	202.01	6398.89	-12.09	-46.65	-12.09	48.19	255.47	.53
6500.00	1.98	197.28	6498.82	-15.62	-47.92	-15.62	50.40	251.95	.38
6600.00	1.55	197.88	6598.77	-18.55	-48.85	-18.55	52.26	249.20	.43
6700.00	.80	236.41	6698.75	-20.23	-49.85	-20.23	53.80	247.92	1.05

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	
6800.00	.37	263.49	6798.74	-20.65	-50.75	-20.65	54.79	247.86	.50
6900.00	.68	170.66	6898.74	-21.27	-50.98	-21.27	55.24	247.35	.79
7000.00	1.14	172.02	6998.73	-22.84	-50.74	-22.84	55.65	245.76	.46
Last Survey Depth Recorded									
7100.00	1.18	164.71	7098.71	-24.82	-50.33	-24.82	56.12	243.75	.15