



Job Number: SVGJ-170050 - API: 05-123-30968

Company: PDC

Lease/Well: Wells Ranch State 31-28

Location: Weld County, CO

Rig Name: MS Slickline 2788

RKB: 0'

G.L. or M.S.L.: GL

State/Country: Colorado/USA

Declination: 8.21°

Grid: East To True North

File name: C:\WINSER~1\2017\PDC\GJ\WELLSR~1\3128.SVY

Date/Time: 17-Apr-17 / 09:34

Curve Name: Surface - 6700' M.D. (Rate Gyro)

Lat: 40.46317 Long: -104.439

## MS Energy

WINSERVE SURVEY CALCULATIONS  
 Minimum Curvature Method  
 Vertical Section Plane .00  
 Vertical Section Referenced to Wellhead  
 Rectangular Coordinates Referenced to Wellhead

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	
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
100.00	.47	338.70	100.00	.38	-.15	.38	.41	338.70	.47
200.00	.30	325.21	200.00	.98	-.45	.98	1.08	335.45	.19
300.00	.22	318.06	300.00	1.34	-.73	1.34	1.52	331.53	.09
400.00	.11	336.48	400.00	1.57	-.89	1.57	1.80	330.37	.12
500.00	.05	287.85	500.00	1.67	-.97	1.67	1.93	329.80	.09
600.00	.13	260.87	599.99	1.66	-1.13	1.66	2.01	325.95	.09
700.00	.10	263.06	699.99	1.64	-1.32	1.64	2.10	321.03	.03
800.00	.16	221.31	799.99	1.52	-1.50	1.52	2.14	315.35	.11
900.00	.25	210.14	899.99	1.23	-1.70	1.23	2.10	305.76	.10
1000.00	.33	215.28	999.99	.80	-1.98	.80	2.14	292.08	.08
1100.00	.32	213.27	1099.99	.33	-2.30	.33	2.32	278.28	.02
1200.00	.34	207.40	1199.99	-.16	-2.59	-.16	2.59	266.42	.04

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	
1300.00	.29	201.99	1299.99	-.66	-2.82	-.66	2.90	256.83	.06
1400.00	.27	202.95	1399.99	-1.11	-3.01	-1.11	3.21	249.71	.02
1500.00	.33	200.78	1499.99	-1.60	-3.20	-1.60	3.58	243.47	.06
1600.00	.28	195.56	1599.98	-2.10	-3.37	-2.10	3.97	238.03	.06
1700.00	.34	201.52	1699.98	-2.61	-3.54	-2.61	4.40	233.58	.07
1800.00	.30	198.28	1799.98	-3.14	-3.73	-3.14	4.88	229.95	.04
1900.00	.30	197.74	1899.98	-3.64	-3.90	-3.64	5.33	226.97	.00
2000.00	.25	203.29	1999.98	-4.09	-4.06	-4.09	5.76	224.83	.06
2100.00	.23	214.74	2099.98	-4.45	-4.26	-4.45	6.16	223.76	.05
2200.00	.26	217.56	2199.98	-4.80	-4.52	-4.80	6.59	223.27	.03
2300.00	.22	239.70	2299.98	-5.07	-4.82	-5.07	7.00	223.53	.10
2400.00	.15	268.40	2399.98	-5.17	-5.12	-5.17	7.28	224.68	.11
2500.00	.23	306.35	2499.97	-5.06	-5.41	-5.06	7.41	226.92	.14
2600.00	.26	315.08	2599.97	-4.78	-5.73	-4.78	7.46	230.18	.05
2700.00	.27	341.83	2699.97	-4.39	-5.96	-4.39	7.41	233.62	.12
2800.00	.27	345.06	2799.97	-3.94	-6.10	-3.94	7.26	237.12	.02
2900.00	.34	359.32	2899.97	-3.42	-6.16	-3.42	7.05	240.98	.10
3000.00	.43	349.11	2999.97	-2.75	-6.24	-2.75	6.82	246.18	.11
3100.00	.52	348.60	3099.96	-1.94	-6.40	-1.94	6.69	253.13	.09
3200.00	.59	13.81	3199.96	-1.00	-6.36	-1.00	6.44	261.11	.25
3300.00	.59	46.33	3299.95	-.14	-5.87	-.14	5.87	268.64	.33
3400.00	.57	54.80	3399.95	.50	-5.09	.50	5.12	275.64	.09
3500.00	.60	72.29	3499.94	.95	-4.19	.95	4.29	282.77	.18
3600.00	.60	82.61	3599.94	1.18	-3.17	1.18	3.38	290.36	.11
3700.00	.60	90.76	3699.93	1.24	-2.12	1.24	2.46	300.19	.09
3800.00	.44	76.65	3799.93	1.32	-1.23	1.32	1.80	317.03	.20
3900.00	.37	54.27	3899.93	1.59	-.59	1.59	1.70	339.65	.17
4000.00	.41	32.01	3999.92	2.09	-.14	2.09	2.09	356.17	.16
4100.00	.88	18.51	4099.92	3.12	.29	3.12	3.13	5.38	.49
4200.00	1.40	13.41	4199.90	5.03	.82	5.03	5.10	9.26	.53
4300.00	1.86	9.10	4299.86	7.83	1.36	7.83	7.94	9.86	.48
4400.00	2.45	11.57	4399.79	11.52	2.05	11.52	11.70	10.07	.60
4500.00	2.77	12.47	4499.68	15.98	3.00	15.98	16.25	10.62	.32
4600.00	2.97	26.94	4599.56	20.64	4.69	20.64	21.17	12.80	.75

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	
4700.00	3.04	30.61	4699.42	25.24	7.22	25.24	26.25	15.96	.20
4800.00	2.48	28.79	4799.30	29.41	9.61	29.41	30.94	18.09	.57
4900.00	1.67	17.90	4899.24	32.70	11.10	32.70	34.53	18.75	.90
5000.00	1.42	17.77	4999.20	35.26	11.92	35.26	37.22	18.68	.25
5100.00	.82	33.30	5099.18	37.04	12.70	37.04	39.16	18.92	.67
5200.00	.44	79.02	5199.18	37.71	13.46	37.71	40.04	19.65	.60
5300.00	.42	107.14	5299.17	37.68	14.19	37.68	40.26	20.64	.21
5400.00	.60	160.75	5399.17	37.08	14.71	37.08	39.89	21.65	.49
5500.00	.78	168.72	5499.16	35.91	15.02	35.91	38.93	22.70	.20
5600.00	.85	169.44	5599.15	34.52	15.29	34.52	37.75	23.89	.07
5700.00	.90	170.21	5699.14	33.01	15.56	33.01	36.50	25.23	.05
5800.00	.87	166.98	5799.13	31.50	15.86	31.50	35.27	26.73	.06
5900.00	.69	164.82	5899.12	30.18	16.19	30.18	34.25	28.22	.18
6000.00	.62	172.07	5999.11	29.06	16.42	29.06	33.38	29.47	.11
6100.00	.55	191.93	6099.11	28.06	16.40	28.06	32.50	30.31	.21
6200.00	.45	203.53	6199.11	27.23	16.14	27.23	31.65	30.67	.14
6300.00	.45	221.25	6299.10	26.57	15.73	26.57	30.88	30.62	.14
6400.00	.44	215.61	6399.10	25.96	15.25	25.96	30.11	30.42	.04
6500.00	.40	218.00	6499.10	25.38	14.81	25.38	29.38	30.26	.04
6600.00	.27	199.86	6599.09	24.88	14.51	24.88	28.80	30.25	.17
Last Survey Depth Recorded									
6700.00	.41	178.07	6699.09	24.30	14.44	24.30	28.27	30.73	.19