



**Job Number:** SVGJ-150203  
**Company:** PDC  
**Lease/Well:** Hoshiko 32-17  
**Location:** Weld County, CO  
**Rig Name:** MS Energy Wireline  
**RKB:** 0'  
**G.L. or M.S.L.:** GL

**State/Country:** Colorado/USA  
**Declination:** 8.42°  
**Grid:** East To True North  
**File name:** W:\WINSER~1\2015SU~1\PDC\GJ\HOSHIKO\3217.SVY  
**Date/Time:** 12-Oct-15 / 10:25  
**Curve Name:** Surface - 6700' 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*

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	True Vertical Depth	N-S FT	E-W FT	Vertical Section FT	CLOSURE		Dogleg Severity Deg/100
							Distance FT	Direction Deg	
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
100.00	.26	99.75	100.00	-.04	.22	-.04	.23	99.75	.26
200.00	.49	141.57	200.00	-.41	.71	-.41	.82	120.01	.34
300.00	.57	124.70	299.99	-1.03	1.39	-1.03	1.73	126.58	.17
400.00	.85	124.28	399.99	-1.73	2.41	-1.73	2.97	125.69	.28
500.00	1.07	123.93	499.97	-2.67	3.80	-2.67	4.64	125.11	.22
600.00	1.13	121.92	599.95	-3.71	5.41	-3.71	6.56	124.46	.07
700.00	1.24	123.74	699.93	-4.83	7.15	-4.83	8.63	124.08	.12
800.00	1.17	121.21	799.91	-5.96	8.92	-5.96	10.73	123.77	.09
900.00	1.13	118.44	899.89	-6.96	10.66	-6.96	12.73	123.16	.07
1000.00	1.05	115.56	999.87	-7.83	12.35	-7.83	14.62	122.36	.10
1100.00	1.02	109.46	1099.86	-8.52	14.02	-8.52	16.40	121.29	.11
1200.00	.94	98.51	1199.84	-8.94	15.67	-8.94	18.04	119.70	.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	
1300.00	.83	89.63	1299.83	-9.05	17.20	-9.05	19.44	117.76	.18
1400.00	.58	72.76	1399.82	-8.90	18.41	-8.90	20.45	115.80	.32
1500.00	.33	23.81	1499.82	-8.49	19.01	-8.49	20.82	114.06	.44
1600.00	.57	326.75	1599.82	-7.81	18.86	-7.81	20.41	112.49	.48
1700.00	.88	317.53	1699.81	-6.82	18.06	-6.82	19.31	110.70	.33
1800.00	.89	311.94	1799.80	-5.74	16.97	-5.74	17.91	108.69	.09
1900.00	.83	270.34	1899.79	-5.22	15.67	-5.22	16.51	108.41	.61
2000.00	.94	252.45	1999.77	-5.46	14.16	-5.46	15.18	111.08	.30
2100.00	.79	244.71	2099.76	-6.00	12.75	-6.00	14.09	115.20	.19
2200.00	.62	218.67	2199.75	-6.72	11.79	-6.72	13.57	119.67	.36
2300.00	.58	190.55	2299.75	-7.64	11.36	-7.64	13.69	123.91	.29
2400.00	.50	162.37	2399.75	-8.55	11.40	-8.55	14.25	126.87	.27
2500.00	.65	139.18	2499.74	-9.40	11.90	-9.40	15.17	128.28	.27
2600.00	.69	141.60	2599.73	-10.30	12.65	-10.30	16.31	129.15	.05
2700.00	.71	146.59	2699.73	-11.29	13.36	-11.29	17.49	130.18	.06
2800.00	1.13	146.99	2799.71	-12.63	14.24	-12.63	19.04	131.57	.42
2900.00	2.03	150.04	2899.67	-14.99	15.66	-14.99	21.68	133.74	.90
3000.00	2.20	154.35	2999.61	-18.26	17.38	-18.26	25.21	136.41	.23
3100.00	2.41	160.48	3099.52	-21.97	18.91	-21.97	28.99	139.27	.32
3200.00	2.59	164.75	3199.43	-26.13	20.21	-26.13	33.03	142.28	.26
3300.00	2.53	167.57	3299.33	-30.47	21.28	-30.47	37.16	145.07	.14
3400.00	1.85	187.73	3399.26	-34.22	21.54	-34.22	40.43	147.82	1.02
3500.00	2.09	210.87	3499.20	-37.38	20.38	-37.38	42.58	151.40	.82
3600.00	2.20	211.77	3599.13	-40.58	18.44	-40.58	44.57	155.57	.12
3700.00	2.32	210.44	3699.05	-43.96	16.40	-43.96	46.92	159.54	.13
3800.00	2.57	208.34	3798.96	-47.68	14.31	-47.68	49.78	163.29	.27
3900.00	2.59	206.53	3898.86	-51.67	12.24	-51.67	53.10	166.67	.08
4000.00	2.49	206.53	3998.76	-55.64	10.26	-55.64	56.57	169.55	.10
4100.00	2.28	207.33	4098.67	-59.35	8.38	-59.35	59.94	171.97	.21
4200.00	2.19	213.63	4198.60	-62.71	6.40	-62.71	63.03	174.17	.26
4300.00	2.27	225.61	4298.52	-65.68	3.93	-65.68	65.80	176.57	.47
4400.00	2.32	227.36	4398.44	-68.44	1.03	-68.44	68.45	179.14	.09
4500.00	1.56	232.72	4498.39	-70.63	-1.55	-70.63	70.65	181.25	.78
4600.00	.73	251.15	4598.37	-71.66	-3.23	-71.66	71.74	182.58	.90

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	.49	27.18	4698.36	-71.49	-3.64	-71.49	71.58	182.91	1.13
4800.00	1.54	50.75	4798.35	-70.26	-2.40	-70.26	70.30	181.96	1.11
4900.00	1.73	54.50	4898.30	-68.53	-.13	-68.53	68.53	180.11	.22
5000.00	1.75	58.72	4998.26	-66.86	2.40	-66.86	66.91	177.94	.13
5100.00	1.43	70.69	5098.22	-65.66	4.88	-65.66	65.84	175.75	.46
5200.00	1.27	65.61	5198.19	-64.79	7.07	-64.79	65.17	173.77	.20
5300.00	.76	44.60	5298.18	-63.86	8.55	-63.86	64.43	172.38	.62
5400.00	.77	41.25	5398.17	-62.88	9.45	-62.88	63.59	171.45	.05
5500.00	.87	14.33	5498.16	-61.64	10.08	-61.64	62.46	170.71	.39
5600.00	.98	9.85	5598.15	-60.06	10.42	-60.06	60.96	170.16	.13
5700.00	1.11	2.47	5698.13	-58.25	10.61	-58.25	59.21	169.68	.19
5800.00	1.37	351.00	5798.11	-56.10	10.46	-56.10	57.07	169.44	.36
5900.00	1.59	344.92	5898.07	-53.58	9.91	-53.58	54.49	169.52	.27
6000.00	1.87	342.56	5998.03	-50.69	9.06	-50.69	51.49	169.86	.29
6100.00	2.32	338.22	6097.96	-47.25	7.82	-47.25	47.89	170.60	.48
6200.00	2.95	337.41	6197.85	-42.99	6.08	-42.99	43.42	171.95	.63
6300.00	3.45	340.11	6297.70	-37.79	4.07	-37.79	38.01	173.85	.52
6400.00	3.85	345.16	6397.49	-31.71	2.19	-31.71	31.79	176.05	.51
6500.00	4.07	349.62	6497.26	-24.98	.69	-24.98	24.99	178.42	.38
6600.00	3.72	353.65	6597.02	-18.26	-.31	-18.26	18.27	180.97	.44
<b>Last Survey Depth Recorded</b>									
6700.00	1.85	1.94	6696.90	-13.43	-.61	-13.43	13.44	182.61	1.91