Company: Northeast Energy
Lease/Well: MIP/3H

Rig Name: US Energy Rig 9
State/County: West Virginia/Monongalia
VS-Azi: 323.00 Degrees
Latitude: 39.60170, Longitude: -79.97633
Grid Convergence Applied = +0.30 degs (NAD 27)
Grid North = True North +0.30 degs

FIELD COPY ONLY (NOT DEFINITIVE)

Depth Reference : RKB = 12'

DRILLOG HA GYRO SURVEY CALCULATIONS
Filename: mip 3h-de_01.ut
Minimum Curvature Method
Report Date/Time: 7/14/2015 / 15:43

VES Survey International
Morgantown, WV
304-777-2189
T.C. Richards

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	****
100.00	0.42	156.90	100.00	-0.34	0.14	-0.36	0.37	156.90	0.42
200.00	0.63	185.61	199.99	-1.23	0.24	-1.12	1.25	169.09	0.33
300.00	0.69	182.45	299.99	-2.37	0.16	-1.99	2.37	176.21	0.07
400.00	0.88	231.58	399.98	-3.44	-0.47	-2.47	3.47	187.75	0.67
500.00	0.28	276.25	499.97	-3.89	-1.31	-2.32	4.11	198.59	0.71
600.00	0.29	271.92	599.97	-3.86	-1.80	-2.00	4.26	205.05	0.03
700.00	0.44	270.09	699.97	-3.85	-2.44	-1.61	4.56	212.35	0.15
800.00	0.45	262.83	799.97	-3.90	-3.20	-1.18	5.05	219.44	0.06
900.00	0.41	227.92	899.97	-4.18	-3.86	-1.02	5.69	222.66	0.26
1000.00	0.63	235.53	999.96	-4.74	-4.58	-1.03	6.59	224.01	0.23
1100.00	0.82	250.18	1099.95	-5.29	-5.70	-0.79	7.78	227.15	0.26
1200.00	0.94	258.21	1199.94	-5.70	-7.18	-0.23	9.17	231.54	0.17
1300.00	1.08	248.39	1299.93	-6.21	-8.85	0.36	10.82	234.93	0.22
1400.00	1.12	246.63	1399.91	-6.95	-10.62	0.84	12.69	236.81	0.05
1500.00	1.14	243.23	1499.89	-7.78	-12.40	1.25	14.64	237.89	0.07
1600.00	1.12	216.81	1599.87	-9.01	-13.87	1.15	16.54	237.00	0.52
1700.00	0.67	208.16	1699.86	-10.30	-14.73	0.64	17.97	235.03	0.47
1800.00	0.72	248.96	1799.85	-11.04	-15.59	0.57	19.10	234.70	0.49
1900.00	0.70	221.83	1899.84	-11.72	-16.59	0.62	20.31	234.75	0.33
2000.00	0.45	231.01	1999.84	-12.42	-17.30	0.49	21.30	234.32	0.27
2100.00	0.39	257.87	2099.84	-12.74	-17.93	0.62	22.00	234.61	0.20
2200.00	0.38	279.40	2199.83	-12.76	-18.59	1.00	22.55	235.54	0.14
2300.00	0.83	288.12	2299.83	-12.48	-19.61	1.83	23.24	237.52	0.46
2400.00	1.12	285.37	2399.81	-11.99	-21.24	3.20	24.39	240.54	0.30
2500.00	0.95	283.79	2499.80	-11.54	-22.99	4.62	25.72	243.35	0.17
2600.00	0.94	287.25	2599.78	-11.10	-24.58	5.93	26.97	245.70	0.06
2700.00	1.09	300.82	2699.77	-10.37	-26.17	7.47	28.15	248.39	0.28
2800.00	1.20	282.59	2799.75	-9.65	-28.01	9.15	29.63	250.98	0.38
2900.00	1.33	286.36	2899.72	-9.10	-30.14	10.87	31.48	253.20	0.15
3000.00	1.39	289.94	2999.70	-8.36	-32.39	12.82	33.45	255.53	0.11
3100.00	1.47	266.38	3099.67	-8.03	-34.81	14.54	35.72	257.02	0.59
3200.00	1.31	297.88	3199.64	-7.57	-37.10	16.28	37.86	258.46	0.77
3300.00	1.57	286.93	3299.61	-6.64	-39.42	18.42	39.97	260.44	0.38

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
3400.00	1.22	288.22	3399.58	-5.91	-41.74	20.40	42.16	261.94	0.35
3500.00	1.43	294.24	3499.55	-5.06	-43.89	22.37	44.18	263.42	0.25
3600.00	1.63	293.51	3599.51	-3.98	-46.33	24.70	46.51	265.09	0.20
3700.00	1.30	286.90	3699.48	-3.09	-48.72	26.86	48.82	266.38	0.37
3800.00	1.26	285.87	3799.46	-2.45	-50.87	28.65	50.93	267.24	0.04
3900.00	1.45	299.91	3899.43	-1.52	-53.03	30.70	53.05	268.36	0.38
4000.00	1.62	301.18	3999.39	-0.16	-55.33	33.18	55.34	269.84	0.16
4100.00	1.35	301.72	4099.36	1.19	-57.54	35.58	57.56	271.19	0.26
4200.00	1.83	295.88	4199.32	2.51	-59.98	38.10	60.03	272.39	0.50
4300.00	1.81	297.96	4299.27	3.94	-62.81	40.95	62.93	273.59	0.07
4400.00	1.87	293.98	4399.22	5.34	-65.69	43.80	65.90	274.65	0.14
4500.00	1.95	292.56	4499.16	6.66	-68.75	46.70	69.07	275.53	0.10
4600.00	1.96	286.72	4599.10	7.81	-71.97	49.55	72.39	276.19	0.20
4700.00	1.69	281.17	4699.05	8.59	-75.06	52.03	75.55	276.53	0.32
4800.00	1.84	279.39	4799.01	9.13	-78.09	54.29	78.62	276.67	0.15
4900.00	1.90	291.08	4898.95	9.99	-81.21	56.85	81.82	277.01	0.38
5000.00	2.30	301.03	4998.89	11.62	-84.48	60.12	85.27	277.83	0.54
5100.00	2.25	306.39	5098.81	13.82	-87.78	63.86	88.86	278.95	0.22
5200.00	1.88	304.40	5198.74	15.91	-90.71	67.30	92.10	279.95	0.37
5300.00	1.49	305.76	5298.70	17.60	-93.12	70.10	94.77	280.70	0.40
5400.00	1.57	317.94	5398.66	19.37	-95.09	72.70	97.04	281.52	0.33
5500.00	1.42	317.22	5498.63	21.30	-96.85	75.29	99.16	282.40	0.15
5600.00	1.12	333.06	5598.61	23.07	-98.13	77.48	100.80	283.23	0.46
5700.00	0.52	323.22	5698.60	24.30	-98.84	78.89	101.78	283.81	0.61
5800.00	0.72	2.11	5798.59	25.29	-99.09	79.83	102.27	284.32	0.45
5900.00	0.51	60.49	5898.59	26.14	-98.68	80.26	102.08	284.84	0.63
6000.00	0.32	13.28	5998.58	26.64	-98.22	80.38	101.77	285.17	0.38
6100.00	0.27	14.02	6098.58	27.14	-98.10	80.71	101.78	285.46	0.06
6200.00	0.52	357.71	6198.58	27.81	-98.06	81.23	101.93	285.84	0.28
6300.00	0.79	329.34	6298.57	28.86	-98.43	82.29	102.58	286.34	0.42
6400.00	1.05	305.37	6398.56	29.99	-99.53	83.85	103.95	286.77	0.45
6500.00	0.66	309.59	6498.55	30.88	-100.72	85.28	105.35	287.05	0.39
6600.00	0.76	307.88	6598.54	31.66	-101.69	86.48	106.50	287.29	0.10
6700.00	0.73	288.99	6698.53	32.28	-102.82	87.65	107.76	287.43	0.25
6800.00	1.18	295.18	6798.52	32.92	-104.35	89.09	109.42	287.51	0.46
6878.00	1.30	287.01	6876.50	33.52	-105.92	90.52	111.10	287.56	0.27

HORIZONTAL DISPLACEMENT IS
111.10 FEET AT 287.56 DEGREES