

VES

VAUGHN ENERGY SERVICES

Company: Noble
Lease/Well: Embrick/10-19

Location:

Rig Name: Production
State/County: Colorado/Weld CountyLatitude: 40.32
GRID North is 0.62 Degrees East of True North
VS-Azi: 0.00 Degrees**GTI**

GYRO TECHNOLOGIES, INC

FIELD COPY ONLY (NOT DEFINITIVE)

Depth Reference : GL

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: run1-01_ed.ut
Minimum Curvature Method
Report Date/Time: 3/23/2011 / 11:41Vaughn Energy Services
Rifle, Colorado
970-456-2071
Garry Fowler
Embrick C 10-19/05-123-21828

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	0.81	347.55	100.00	0.69	-0.15	0.69	0.71	347.55	0.81
200.00	0.80	348.02	199.99	2.07	-0.45	2.07	2.12	347.70	0.01
300.00	0.79	352.38	299.98	3.44	-0.69	3.44	3.50	348.69	0.06
400.00	0.85	358.57	399.97	4.86	-0.80	4.86	4.92	350.68	0.10
500.00	0.87	355.44	499.96	6.35	-0.88	6.35	6.41	352.15	0.05
600.00	1.23	3.72	599.94	8.18	-0.87	8.18	8.22	353.95	0.39
700.00	1.34	6.02	699.91	10.40	-0.68	10.40	10.43	356.29	0.12
800.00	1.08	14.58	799.89	12.47	-0.32	12.47	12.48	358.55	0.31
900.00	0.95	13.63	899.88	14.19	0.12	14.19	14.19	0.47	0.13
1000.00	0.92	13.56	999.86	15.77	0.50	15.77	15.78	1.81	0.03
1100.00	1.28	13.38	1099.84	17.63	0.94	17.63	17.65	3.06	0.36
1200.00	1.09	20.03	1199.82	19.61	1.53	19.61	19.67	4.46	0.23
1300.00	0.89	30.27	1299.81	21.18	2.25	21.18	21.30	6.06	0.27
1400.00	0.87	34.76	1399.80	22.48	3.08	22.48	22.69	7.79	0.07
1500.00	0.58	24.48	1499.79	23.57	3.72	23.57	23.86	8.97	0.32
1600.00	0.35	12.90	1599.78	24.33	4.00	24.33	24.65	9.34	0.25
1700.00	0.32	233.17	1699.78	24.46	3.84	24.46	24.76	8.93	0.63
1800.00	0.39	231.02	1799.78	24.07	3.35	24.07	24.31	7.93	0.07
1900.00	0.33	239.55	1899.78	23.71	2.84	23.71	23.88	6.83	0.09
2000.00	0.35	244.84	1999.78	23.44	2.32	23.44	23.55	5.64	0.04
2100.00	0.42	248.84	2099.78	23.17	1.69	23.17	23.23	4.18	0.07
2200.00	0.53	261.93	2199.77	22.98	0.89	22.98	22.99	2.23	0.15
2300.00	0.57	338.67	2299.77	23.38	0.26	23.38	23.38	0.63	0.68
2400.00	1.02	337.87	2399.76	24.67	-0.26	24.67	24.67	359.40	0.45
2500.00	1.01	329.71	2499.74	26.25	-1.04	26.25	26.27	357.73	0.14
2600.00	1.01	312.33	2599.73	27.60	-2.13	27.60	27.69	355.58	0.30
2700.00	1.06	303.28	2699.71	28.70	-3.56	28.70	28.92	352.94	0.17
2800.00	0.81	309.63	2799.70	29.66	-4.88	29.66	30.06	350.66	0.28
2900.00	0.55	303.45	2899.69	30.38	-5.82	30.38	30.93	349.16	0.27
3000.00	0.58	326.14	2999.69	31.06	-6.50	31.06	31.73	348.18	0.22
3100.00	0.56	323.54	3099.68	31.87	-7.07	31.87	32.65	347.49	0.03

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
3200.00	0.85	336.74	3199.67	32.95	-7.65	32.95	33.83	346.92	0.33
3300.00	0.86	333.21	3299.66	34.30	-8.28	34.30	35.28	346.42	0.05
3400.00	0.93	323.26	3399.65	35.62	-9.11	35.62	36.76	345.66	0.17
3500.00	1.19	310.67	3499.63	36.94	-10.38	36.94	38.38	344.30	0.35
3600.00	1.47	306.01	3599.61	38.38	-12.21	38.38	40.27	342.35	0.30
3700.00	1.72	297.59	3699.57	39.83	-14.58	39.83	42.41	339.90	0.34
3800.00	1.94	297.75	3799.52	41.31	-17.41	41.31	44.83	337.15	0.22
3900.00	2.03	284.10	3899.46	42.53	-20.63	42.53	47.27	334.13	0.48
4000.00	2.21	283.46	3999.39	43.41	-24.22	43.41	49.71	330.84	0.18
4100.00	2.22	284.05	4099.31	44.33	-27.98	44.33	52.42	327.74	0.02
4200.00	2.20	293.10	4199.24	45.56	-31.63	45.56	55.46	325.23	0.35
4300.00	2.17	296.10	4299.17	47.14	-35.09	47.14	58.77	323.34	0.12
4400.00	1.95	297.68	4399.10	48.76	-38.30	48.76	62.00	321.86	0.23
4500.00	1.56	297.09	4499.06	50.17	-41.01	50.17	64.80	320.74	0.38
4600.00	1.44	294.08	4599.02	51.31	-43.38	51.31	67.19	319.79	0.14
4700.00	1.24	290.61	4698.99	52.20	-45.54	52.20	69.28	318.90	0.22
4800.00	0.87	290.85	4798.98	52.86	-47.27	52.86	70.91	318.19	0.37
4900.00	0.89	285.76	4898.96	53.34	-48.73	53.34	72.25	317.59	0.08
5000.00	0.80	270.28	4998.95	53.55	-50.18	53.55	73.39	316.86	0.24
5100.00	0.83	237.26	5098.94	53.16	-51.48	53.16	74.01	315.92	0.46
5200.00	0.89	218.53	5198.93	52.17	-52.58	52.17	74.06	314.78	0.29
5300.00	1.13	208.30	5298.92	50.69	-53.53	50.69	73.72	313.44	0.30
5400.00	1.22	206.16	5398.90	48.86	-54.47	48.86	73.17	311.90	0.10
5500.00	1.48	196.53	5498.87	46.67	-55.30	46.67	72.36	310.16	0.35
5600.00	1.50	177.91	5598.84	44.13	-55.62	44.13	71.00	308.43	0.48
5700.00	1.55	160.99	5698.80	41.54	-55.13	41.54	69.03	306.99	0.45
5800.00	1.55	152.15	5798.76	39.07	-54.06	39.07	66.70	305.85	0.24
5900.00	1.53	128.00	5898.73	37.05	-52.38	37.05	64.16	305.27	0.64
6000.00	1.51	107.53	5998.69	35.83	-50.07	35.83	61.57	305.59	0.54
6100.00	1.67	109.55	6098.66	34.95	-47.44	34.95	58.92	306.38	0.17
6200.00	2.04	110.39	6198.60	33.84	-44.40	33.84	55.83	307.31	0.37
6300.00	2.06	125.43	6298.54	32.18	-41.27	32.18	52.33	307.94	0.54
6400.00	2.55	135.46	6398.46	29.55	-38.24	29.55	48.32	307.69	0.63
6500.00	2.79	133.28	6498.35	26.29	-34.91	26.29	43.70	306.99	0.26
6600.00	3.07	135.97	6598.22	22.70	-31.27	22.70	38.64	305.97	0.31
6700.00	2.36	132.78	6698.11	19.37	-27.90	19.37	33.97	304.78	0.72
6800.00	1.96	137.16	6798.04	16.72	-25.23	16.72	30.27	303.54	0.44

HORIZONTAL DISPLACEMENT IS 30.27 FEET AT 303.54 DEGREES									
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