

VES

VAUGHN ENERGY SERVICES

Company: Noble Energy

Lease/Well: Thompson / 28-16

Location: S-28 T-4N R-64W

Rig Name: Production

State/County: Colorado / Weld County

Latitude: 40.28, Longitude: -104.55

GRID North is 0.61 Degrees East of True North

VS-Azi: 0.00 Degrees

GTI

GYRO TECHNOLOGIES, INC

FIELD COPY ONLY (NOT DEFINITIVE)

Depth Reference : RKB = Ground Level

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: inrun_ed.ut

Minimum Curvature Method

Report Date/Time: 2/10/2011 / 17:34

Vaughn Energy Services

Fort Worth, Texas

817-741-3610

Robert Davis

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	0.23	116.68	100.00	-0.09	0.18	-0.09	0.20	116.68	0.23
200.00	0.37	157.80	200.00	-0.48	0.48	-0.48	0.68	134.94	0.25
300.00	0.21	170.70	300.00	-0.96	0.63	-0.96	1.15	146.68	0.17
400.00	0.40	166.74	400.00	-1.48	0.74	-1.48	1.66	153.42	0.18
500.00	0.51	142.45	499.99	-2.17	1.09	-2.17	2.43	153.29	0.22
600.00	0.09	147.58	599.99	-2.59	1.41	-2.59	2.95	151.51	0.42
700.00	0.22	302.41	699.99	-2.55	1.28	-2.55	2.86	153.30	0.31
800.00	0.26	325.51	799.99	-2.26	0.99	-2.26	2.47	156.32	0.10
900.00	0.04	93.41	899.99	-2.08	0.90	-2.08	2.26	156.68	0.28
1000.00	0.26	289.85	999.99	-2.00	0.72	-2.00	2.13	160.36	0.29
1100.00	0.24	355.10	1099.99	-1.72	0.49	-1.72	1.79	164.23	0.27
1200.00	0.28	275.56	1199.99	-1.49	0.22	-1.49	1.50	171.50	0.34
1300.00	0.32	275.36	1299.99	-1.44	-0.30	-1.44	1.47	191.87	0.04
1400.00	0.28	261.45	1399.99	-1.45	-0.83	-1.45	1.67	209.73	0.08
1500.00	0.32	276.15	1499.98	-1.45	-1.35	-1.45	1.98	222.91	0.09
1600.00	0.17	321.08	1599.98	-1.31	-1.72	-1.31	2.16	232.82	0.24
1700.00	0.08	311.38	1699.98	-1.15	-1.87	-1.15	2.19	238.41	0.10
1800.00	0.06	183.43	1799.98	-1.16	-1.92	-1.16	2.24	238.93	0.12
1900.00	0.07	102.48	1899.98	-1.22	-1.86	-1.22	2.23	236.66	0.09
2000.00	0.10	124.28	1999.98	-1.29	-1.72	-1.29	2.15	233.20	0.04
2100.00	0.32	68.39	2099.98	-1.24	-1.39	-1.24	1.86	228.35	0.27
2200.00	0.22	107.61	2199.98	-1.20	-0.95	-1.20	1.53	218.51	0.20
2300.00	0.10	102.41	2299.98	-1.27	-0.68	-1.27	1.44	208.17	0.12
2400.00	0.29	24.10	2399.98	-1.06	-0.49	-1.06	1.17	204.96	0.28
2500.00	0.28	348.16	2499.98	-0.60	-0.44	-0.60	0.74	216.64	0.17
2600.00	0.33	308.24	2599.98	-0.18	-0.72	-0.18	0.74	256.21	0.21
2700.00	0.28	341.79	2699.98	0.24	-1.03	0.24	1.05	282.93	0.18
2800.00	0.08	351.22	2799.98	0.53	-1.11	0.53	1.23	295.62	0.21
2900.00	0.10	323.90	2899.98	0.67	-1.17	0.67	1.35	299.70	0.05
3000.00	0.16	218.22	2999.98	0.63	-1.31	0.63	1.46	295.74	0.21
3100.00	0.15	172.16	3099.97	0.39	-1.38	0.39	1.43	285.82	0.12
3200.00	0.77	244.91	3199.97	-0.03	-1.97	-0.03	1.97	269.16	0.74
3300.00	0.96	226.57	3299.96	-0.89	-3.19	-0.89	3.31	254.40	0.33
3400.00	1.30	204.98	3399.94	-2.50	-4.28	-2.50	4.95	239.72	0.54

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
3500.00	1.15	185.55	3499.92	-4.53	-4.85	-4.53	6.64	226.99	0.44
3600.00	0.97	153.24	3599.90	-6.28	-4.57	-6.28	7.77	216.04	0.61
3700.00	0.98	164.69	3699.89	-7.86	-3.97	-7.86	8.80	206.78	0.19
3800.00	0.90	144.37	3799.87	-9.31	-3.28	-9.31	9.88	199.42	0.34
3900.00	1.08	139.51	3899.86	-10.67	-2.22	-10.67	10.89	191.75	0.20
4000.00	1.12	177.39	3999.84	-12.36	-1.56	-12.36	12.46	187.21	0.72
4100.00	1.64	155.80	4099.81	-14.64	-0.93	-14.64	14.67	183.65	0.72
4200.00	1.97	167.29	4199.76	-17.62	0.03	-17.62	17.62	179.90	0.49
4300.00	2.87	169.63	4299.67	-21.76	0.86	-21.76	21.77	177.74	0.90
4400.00	3.34	174.78	4399.53	-27.11	1.57	-27.11	27.16	176.68	0.55
4500.00	2.41	174.43	4499.40	-32.11	2.04	-32.11	32.17	176.36	0.93
4600.00	1.80	194.76	4599.33	-35.72	1.85	-35.72	35.77	177.04	0.96
4700.00	1.72	225.07	4699.29	-38.29	0.39	-38.29	38.30	179.42	0.92
4800.00	1.68	242.77	4799.25	-40.02	-1.98	-40.02	40.07	182.83	0.52
4900.00	1.53	244.31	4899.21	-41.27	-4.49	-41.27	41.52	186.21	0.16
5000.00	0.73	236.85	4999.19	-42.20	-6.23	-42.20	42.66	188.39	0.81
5100.00	0.13	265.76	5099.18	-42.56	-6.87	-42.56	43.11	189.18	0.62
5200.00	0.39	1.37	5199.18	-42.23	-6.98	-42.23	42.80	189.39	0.42
5300.00	0.41	10.06	5299.18	-41.54	-6.91	-41.54	42.11	189.45	0.06
5400.00	0.41	19.71	5399.18	-40.85	-6.73	-40.85	41.40	189.35	0.07
5500.00	0.48	59.41	5499.18	-40.29	-6.24	-40.29	40.77	188.81	0.31
5600.00	0.78	62.89	5599.17	-39.77	-5.28	-39.77	40.12	187.56	0.30
5700.00	0.57	59.39	5699.16	-39.21	-4.25	-39.21	39.44	186.18	0.21
5800.00	0.55	90.51	5799.16	-38.96	-3.34	-38.96	39.10	184.89	0.30
5900.00	0.63	61.78	5899.15	-38.70	-2.37	-38.70	38.77	183.50	0.30
6000.00	0.21	94.16	5999.15	-38.45	-1.69	-38.45	38.49	182.52	0.47
6100.00	0.41	69.08	6099.15	-38.34	-1.17	-38.34	38.35	181.75	0.24
6200.00	0.16	155.74	6199.15	-38.34	-0.78	-38.34	38.35	181.16	0.43
6300.00	0.31	43.94	6299.15	-38.28	-0.54	-38.28	38.28	180.80	0.40
6400.00	0.27	153.92	6399.15	-38.30	-0.25	-38.30	38.30	180.37	0.47
6500.00	0.12	177.42	6499.14	-38.61	-0.14	-38.61	38.61	180.21	0.16
6600.00	0.08	189.04	6599.14	-38.79	-0.15	-38.79	38.79	180.21	0.05
6700.00	0.35	107.93	6699.14	-38.96	0.14	-38.96	38.96	179.80	0.35
6800.00	0.46	76.38	6799.14	-38.96	0.82	-38.96	38.96	178.80	0.24
HORIZONTAL DISPLACEMENT IS 38.96 FEET AT 178.80 DEGREES									