

VES

VAUGHN ENERGY SERVICES

Company: Noble Energy

Lease/Well: Rohr C / 15-19

Location: S-15 T-4N R-64W

Rig Name: Production

State/County: Colorado / Weld County

Latitude: 40.32, Longitude: -104.54

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 : RKB = Ground Level

DRILLOG MS GYRO SURVEY CALCULATIONS

Filename: inrun_ed.ut

Minimum Curvature Method

Report Date/Time: 5/5/2011 / 22:39

Vaughn Energy Services

Denver, CO

720-215-1841

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	0.30	339.24	100.00	0.25	-0.09	0.25	0.26	339.24	0.30
200.00	0.19	273.11	200.00	0.50	-0.35	0.50	0.61	325.06	0.28
300.00	0.25	306.13	300.00	0.64	-0.69	0.64	0.94	312.80	0.14
400.00	0.27	303.83	400.00	0.90	-1.06	0.90	1.39	310.25	0.02
500.00	0.32	234.51	500.00	0.87	-1.48	0.87	1.71	300.35	0.34
600.00	0.62	223.11	599.99	0.31	-2.07	0.31	2.10	278.55	0.31
700.00	0.65	230.61	699.99	-0.44	-2.88	-0.44	2.91	261.29	0.09
800.00	0.67	227.34	799.98	-1.19	-3.75	-1.19	3.93	252.31	0.04
900.00	0.75	229.65	899.97	-2.01	-4.67	-2.01	5.09	246.69	0.09
1000.00	0.79	217.35	999.96	-2.99	-5.59	-2.99	6.34	241.88	0.17
1100.00	0.77	207.65	1099.95	-4.14	-6.33	-4.14	7.56	236.82	0.13
1200.00	0.57	233.97	1199.95	-5.03	-7.04	-5.03	8.65	234.48	0.36
1300.00	0.53	217.07	1299.94	-5.69	-7.73	-5.69	9.60	233.63	0.17
1400.00	0.48	233.81	1399.94	-6.31	-8.35	-6.31	10.47	232.91	0.16
1500.00	0.17	170.75	1499.94	-6.71	-8.67	-6.71	10.96	232.27	0.44
1600.00	0.32	160.62	1599.94	-7.11	-8.55	-7.11	11.12	230.25	0.16
1700.00	0.75	97.07	1699.93	-7.46	-7.81	-7.46	10.80	226.33	0.67
1800.00	1.19	105.06	1799.92	-7.81	-6.16	-7.81	9.95	218.30	0.46
1900.00	1.16	112.40	1899.90	-8.46	-4.23	-8.46	9.46	206.56	0.15
2000.00	0.97	112.44	1999.88	-9.17	-2.51	-9.17	9.51	195.34	0.19
2100.00	0.76	118.32	2099.87	-9.81	-1.15	-9.81	9.87	186.68	0.22
2200.00	0.21	188.98	2199.86	-10.30	-0.59	-10.30	10.32	183.29	0.72
2300.00	0.38	227.57	2299.86	-10.71	-0.87	-10.71	10.74	184.63	0.25
2400.00	0.42	220.74	2399.86	-11.21	-1.35	-11.21	11.29	186.88	0.06
2500.00	0.62	234.50	2499.86	-11.80	-2.03	-11.80	11.98	189.76	0.23
2600.00	0.68	246.60	2599.85	-12.35	-3.01	-12.35	12.71	193.70	0.15
2700.00	0.49	242.47	2699.85	-12.78	-3.94	-12.78	13.38	197.11	0.19
2800.00	0.72	229.12	2799.84	-13.39	-4.79	-13.39	14.22	199.68	0.26
2900.00	0.74	208.27	2899.83	-14.37	-5.57	-14.37	15.41	201.18	0.26
3000.00	0.85	204.54	2999.82	-15.62	-6.18	-15.62	16.80	201.61	0.12
3100.00	0.77	227.60	3099.81	-16.74	-6.99	-16.74	18.14	202.65	0.33
3200.00	0.65	224.29	3199.80	-17.60	-7.88	-17.60	19.28	204.11	0.13
3300.00	0.15	233.64	3299.80	-18.08	-8.38	-18.08	19.93	204.86	0.50
3400.00	0.33	87.02	3399.80	-18.14	-8.20	-18.14	19.91	204.31	0.46

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	0.65	82.35	3499.80	-18.05	-7.35	-18.05	19.49	202.16	0.32
3600.00	0.61	93.03	3599.79	-18.01	-6.26	-18.01	19.06	199.16	0.12
3700.00	0.65	99.16	3699.79	-18.13	-5.17	-18.13	18.85	195.91	0.08
3800.00	0.38	139.94	3799.78	-18.47	-4.40	-18.47	18.98	193.39	0.44
3900.00	0.42	158.53	3899.78	-19.06	-4.05	-19.06	19.49	191.99	0.14
4000.00	0.36	157.07	3999.78	-19.69	-3.79	-19.69	20.06	190.90	0.06
4100.00	0.28	214.38	4099.78	-20.19	-3.80	-20.19	20.54	190.67	0.32
4200.00	0.18	269.28	4199.78	-20.39	-4.10	-20.39	20.80	191.36	0.23
4300.00	0.61	297.73	4299.77	-20.14	-4.72	-20.14	20.69	193.20	0.46
4400.00	1.02	289.61	4399.76	-19.60	-6.03	-19.60	20.50	197.11	0.43
4500.00	1.84	293.91	4499.73	-18.65	-8.34	-18.65	20.43	204.09	0.82
4600.00	2.10	292.70	4599.67	-17.29	-11.50	-17.29	20.76	213.62	0.27
4700.00	2.61	278.77	4699.59	-16.24	-15.44	-16.24	22.40	223.56	0.76
4800.00	3.07	269.96	4799.46	-15.89	-20.36	-15.89	25.83	232.03	0.63
4900.00	2.74	265.58	4899.34	-16.08	-25.42	-16.08	30.08	237.69	0.40
5000.00	1.77	260.82	4999.26	-16.51	-29.33	-16.51	33.66	240.63	0.98
5100.00	0.86	263.33	5099.23	-16.84	-31.61	-16.84	35.82	241.95	0.91
5200.00	0.06	95.22	5199.23	-16.93	-32.31	-16.93	36.48	242.34	0.92
5300.00	0.13	130.81	5299.23	-17.01	-32.18	-17.01	36.40	242.13	0.09
5400.00	0.23	140.67	5399.23	-17.24	-31.96	-17.24	36.32	241.65	0.11
5500.00	0.36	144.26	5499.22	-17.66	-31.65	-17.66	36.24	240.84	0.13
5600.00	0.36	134.38	5599.22	-18.13	-31.24	-18.13	36.12	239.88	0.06
5700.00	0.54	97.79	5699.22	-18.41	-30.55	-18.41	35.67	238.93	0.33
5800.00	0.28	105.55	5799.22	-18.54	-29.84	-18.54	35.13	238.15	0.27
5900.00	0.47	81.17	5899.22	-18.54	-29.21	-18.54	34.59	237.59	0.24
6000.00	0.47	63.37	5999.21	-18.30	-28.43	-18.30	33.81	237.24	0.15
6100.00	0.50	43.68	6099.21	-17.79	-27.76	-17.79	32.97	237.34	0.17
6200.00	0.54	34.02	6199.20	-17.08	-27.19	-17.08	32.11	237.86	0.10
6300.00	0.49	36.42	6299.20	-16.35	-26.67	-16.35	31.28	238.50	0.06
6400.00	0.18	76.84	6399.20	-15.97	-26.27	-15.97	30.74	238.71	0.37
6500.00	0.08	82.91	6499.20	-15.92	-26.04	-15.92	30.52	238.56	0.10
6600.00	0.07	32.25	6599.20	-15.86	-25.94	-15.86	30.40	238.56	0.07
6700.00	0.46	9.35	6699.20	-15.42	-25.84	-15.42	30.09	239.18	0.39
HORIZONTAL DISPLACEMENT IS 30.09 FEET AT 239.18 DEGREES									