



Company: Legend Natural Gas
Lease/Well: Full Choke Com/#3H

Rig Name: Patterson Rig #444

State/County: Texas/Eddy

Latitude: 32.17

GRID North is 0.12 Degrees East of True North

VS-Azi: 0.00 Degrees

GTI
GYRO TECHNOLOGIES

30.015.40907

FIELD COPY ONLY (NOT DEFINITIVE)

Depth Reference : RKB = 25 Feet

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: full choke com #3h_01.ut

Minimum Curvature Method

Report Date/Time: 9/19/2013 / 14:06

Vaughn Energy Services

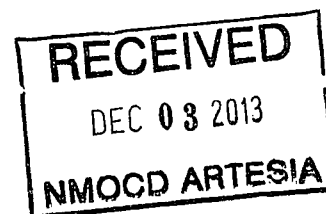
Ft.Worth Tx

817-741-3610

Kenny Gabel

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 Sever Deg/1
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**
100.00	0.30	57.70	100.00	0.14	0.22	0.14	0.26	57.70	0.3
200.00	0.18	298.51	200.00	0.36	0.31	0.36	0.47	40.85	0.4
300.00	1.45	138.45	299.99	-0.52	1.01	-0.52	1.14	117.07	1.6
340.00	1.70	134.07	339.97	-1.31	1.78	-1.31	2.21	126.43	0.7

HORIZONTAL DISPLACEMENT IS
2.21 FEET AT 126.43 DEGREES



V-8036
M-12560

Job Number: 350913HMP-58834
 Company: Legend Natural Gas III,LLC
 Lease/Well: Full Choke Com 3H
 Location: Southwest of Malaga
 Rig Name: Patterson #444
 RKB: 24
 G.L. or M.S.L.: II

State/Country: New Mexico / USA
 Declination: 7.43
 Grid: -0.12
 File name: D:\AAA201~2\LEGEND\35138834.SVY
 Date/Time: 04-Oct-13 / 09:03
 Curve Name: Legend / Full Choke Com 3H (As Drilled)



Legend / Full Choke Com 3H (As Drilled)

WINSERVE SURVEY CALCULATIONS
 Minimum Curvature Method
 Vertical Section Plane 7.95
 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 Distance FT	Direction Deg	Dogleg Severity Deg/100	BUILD RATE Deg/100
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
100.00	.30	57.70	100.00	.14	.22	.17	.26	57.70	.30	.30
200.00	.18	298.51	200.00	.35	.30	.39	.47	40.64	.42	-.12
300.00	1.45	138.45	299.99	-.52	1.01	-.37	1.13	117.21	1.62	1.27
Last Gyro by VES										
340.00	1.70	134.07	339.97	-1.31	1.77	-1.05	2.20	126.51	.69	.63
434.00	2.56	139.53	433.91	-3.88	4.13	-3.27	5.67	133.16	.94	.91
529.00	2.53	141.75	528.81	-7.14	6.81	-6.13	9.86	136.35	.11	-.03
624.00	3.13	112.73	623.70	-9.79	10.50	-8.24	14.35	132.99	1.61	.63
718.00	4.06	101.09	717.52	-11.42	16.13	-9.08	19.76	125.29	1.25	.99
812.00	6.12	92.23	811.14	-12.25	24.40	-8.76	27.31	116.66	2.34	2.19
906.00	7.56	88.64	904.47	-12.30	35.59	-7.26	37.66	109.06	1.60	1.53
1000.00	7.43	88.36	997.67	-11.98	47.85	-5.25	49.33	104.06	.14	-.14
1095.00	7.30	90.10	1091.89	-11.81	60.03	-3.40	61.18	101.13	.27	-.14
1189.00	7.52	92.10	1185.10	-12.05	72.14	-1.96	73.14	99.48	.36	.23
1284.00	6.49	95.85	1279.39	-12.83	83.70	-1.13	84.68	98.71	1.19	-1.08
1378.00	5.80	94.70	1372.85	-13.76	93.72	-.66	94.72	98.35	.75	-.73
1473.00	6.45	88.18	1467.31	-13.98	103.83	.52	104.77	97.67	1.00	.68
1567.00	7.20	91.51	1560.64	-13.97	115.00	2.07	115.85	96.92	.90	.80
1661.00	8.09	92.46	1653.81	-14.41	127.50	3.37	128.31	96.45	.96	.95
1755.00	9.32	88.46	1746.72	-14.49	141.72	5.25	142.45	95.84	1.46	1.31
1850.00	10.18	87.73	1840.35	-13.95	157.79	8.01	158.41	95.05	.91	.91
1945.00	7.30	100.02	1934.24	-14.66	172.13	9.28	172.75	94.87	3.60	-3.03
2039.00	7.26	94.13	2027.49	-16.13	183.94	9.46	184.64	95.01	.79	-.04
2134.00	6.77	88.61	2121.78	-16.43	195.52	10.77	196.21	94.80	.88	-.52
2228.00	6.07	89.25	2215.19	-16.23	206.03	12.42	206.67	94.50	.75	-.74
2322.00	5.27	90.77	2308.73	-16.22	215.32	13.71	215.93	94.31	.87	-.85
2416.00	4.57	90.66	2402.38	-16.32	223.38	14.73	223.97	94.18	.74	-.74
2479.00	4.85	92.18	2465.17	-16.45	228.55	15.32	229.14	94.12	.49	.44
2601.00	6.33	96.20	2586.58	-17.37	240.39	16.04	241.02	94.13	1.25	1.21

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	BUILD RATE Deg/100
				FT	FT	FT	Distance FT	Direction Deg		
2695.00	6.33	89.96	2680.01	-17.93	250.72	16.92	251.36	94.09	.73	.00
2790.00	5.10	79.85	2774.54	-17.18	260.12	18.96	260.68	93.78	1.67	-1.29
2884.00	4.75	82.75	2868.19	-15.96	268.09	21.28	268.56	93.41	.46	-.37
2979.00	5.28	81.87	2962.83	-14.84	276.32	23.52	276.72	93.07	.56	.56
3073.00	5.36	81.87	3056.42	-13.61	284.95	25.93	285.27	92.73	.09	.09
3168.00	5.72	79.85	3150.98	-12.15	294.00	28.63	294.25	92.37	.43	.38
3262.00	5.45	78.27	3244.53	-10.41	302.98	31.59	303.16	91.97	.33	-.29
3357.00	5.36	91.36	3339.12	-9.60	311.83	33.62	311.98	91.76	1.30	-.09
3452.00	5.89	94.00	3433.66	-10.05	321.13	34.46	321.29	91.79	.62	.56
3546.00	5.54	89.52	3527.19	-10.35	330.48	35.46	330.64	91.79	.60	-.37
3641.00	5.72	88.55	3621.73	-10.19	339.80	36.91	339.95	91.72	.21	.19
3735.00	6.07	87.50	3715.24	-9.85	349.45	38.57	349.59	91.61	.39	.37
3830.00	6.51	85.39	3809.66	-9.20	359.83	40.66	359.95	91.46	.52	.46
3924.00	5.63	86.35	3903.14	-8.48	369.75	42.74	369.84	91.31	.94	-.94
4018.00	4.84	85.91	3996.74	-7.90	378.30	44.50	378.39	91.20	.84	-.84
4207.00	4.66	89.87	4185.09	-7.32	393.93	47.24	394.00	91.06	.20	-.10
4397.00	5.10	85.21	4374.41	-6.59	410.07	50.19	410.12	90.92	.31	.23
4585.00	4.40	87.58	4561.76	-5.59	425.60	53.33	425.64	90.75	.39	-.37
4773.00	3.87	84.95	4749.27	-4.73	439.13	56.05	439.15	90.62	.30	-.28
4960.00	4.66	78.44	4935.75	-2.65	452.85	60.01	452.86	90.34	.49	.42
5147.00	7.03	83.45	5121.77	.18	471.67	65.41	471.67	89.98	1.30	1.27
5333.00	6.51	81.70	5306.47	3.00	493.41	71.21	493.42	89.65	.30	-.28
5520.00	6.77	96.11	5492.23	3.36	514.86	74.53	514.87	89.63	.90	.14
5709.00	6.60	103.05	5679.95	-.28	536.52	73.93	536.52	90.03	.44	-.09
5895.00	5.72	93.91	5864.88	-3.33	556.18	73.63	556.19	90.34	.71	-.47
6084.00	6.07	81.26	6052.88	-2.45	575.45	77.16	575.46	90.24	.71	.19
6271.00	4.75	70.97	6239.05	1.57	592.55	83.51	592.55	89.85	.87	-.71
6459.00	5.72	64.29	6426.27	8.18	608.35	92.24	608.40	89.23	.61	.52
6646.00	6.60	77.13	6612.19	14.61	627.22	101.22	627.39	88.67	.87	.47
6835.00	7.12	102.88	6799.88	14.42	649.23	104.08	649.39	88.73	1.64	.28
6930.00	6.77	105.25	6894.19	11.64	660.38	102.86	660.48	88.99	.48	-.37
7024.00	6.68	102.17	6987.54	9.03	671.07	101.75	671.13	89.23	.40	-.10
7118.00	4.66	106.17	7081.08	6.81	680.08	100.81	680.11	89.43	2.19	-2.15
7213.00	2.11	108.59	7175.90	5.18	685.44	99.93	685.46	89.57	2.69	-2.68
7308.00	.88	22.28	7270.88	5.30	687.38	100.32	687.40	89.56	2.35	-1.29
7402.00	1.58	21.75	7364.85	7.17	688.13	102.27	688.17	89.40	.74	.74
7496.00	1.32	3.03	7458.82	9.45	688.67	104.61	688.73	89.21	.57	-.28
7590.00	.53	308.28	7552.81	10.80	688.38	105.91	688.47	89.10	1.17	-.84
7649.00	.59	321.52	7611.81	11.21	687.98	106.26	688.07	89.07	.24	.10
7680.00	4.48	354.51	7642.77	12.54	687.77	107.54	687.88	88.96	12.90	12.55
7711.00	7.74	352.14	7673.59	15.81	687.36	110.73	687.55	88.68	10.55	10.52
7743.00	11.96	356.27	7705.12	21.26	686.85	116.05	687.18	88.23	13.36	13.19
7774.00	15.56	358.29	7735.22	28.62	686.52	123.30	687.12	87.61	11.71	11.61
7806.00	19.35	357.23	7765.74	38.21	686.14	132.74	687.20	86.81	11.88	11.84
7837.00	22.60	357.94	7794.68	49.30	685.67	143.66	687.44	85.89	10.52	10.48
7869.00	25.85	357.94	7823.86	62.42	685.20	156.59	688.04	84.80	10.16	10.16
7900.00	29.28	358.64	7851.34	76.76	684.78	170.73	689.07	83.60	11.11	11.06
7931.00	32.36	359.08	7877.96	92.63	684.47	186.41	690.71	82.29	9.96	9.94
7963.00	36.05	359.52	7904.42	110.62	684.25	204.19	693.13	80.82	11.56	11.53
7994.00	39.75	359.78	7928.88	129.66	684.13	223.03	696.31	79.27	11.95	11.94

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	BUILD RATE Deg/100
				FT	FT	FT	Distance FT	Direction Deg		
8026.00	43.53	358.99	7952.79	150.91	683.90	244.05	700.35	77.56	11.93	11.81
8057.00	47.31	358.55	7974.54	172.98	683.42	265.85	704.98	75.80	12.24	12.19
8088.00	51.53	358.90	7994.70	196.52	682.90	289.08	710.62	73.95	13.64	13.61
8120.00	56.01	359.08	8013.61	222.32	682.45	314.57	717.75	71.96	14.01	14.00
8152.00	60.85	358.73	8030.36	249.57	681.93	341.49	726.16	69.90	15.15	15.13
8184.00	65.77	359.43	8044.73	278.15	681.47	369.73	736.05	67.80	15.50	15.37
8215.00	69.61	359.69	8056.50	306.82	681.25	398.10	747.16	65.75	12.41	12.39
8247.00	73.51	359.61	8066.62	337.17	681.07	428.13	759.96	63.66	12.19	12.19
8278.00	78.08	359.61	8074.22	367.22	680.86	457.86	773.58	61.66	14.74	14.74
8309.00	82.57	359.43	8079.43	397.77	680.61	488.08	788.32	59.70	14.50	14.48
8341.00	87.14	359.96	8082.30	429.63	680.44	519.61	804.72	57.73	14.38	14.28
8373.00	90.13	359.69	8083.06	461.61	680.34	551.28	822.16	55.84	9.38	9.34
8435.00	91.88	359.36	8081.97	523.60	679.82	612.59	858.09	52.40	2.87	2.82
8530.00	92.45	359.72	8078.38	618.53	679.06	706.51	918.53	47.67	.71	.60
8624.00	93.30	.57	8073.67	712.41	679.30	799.52	984.37	43.64	1.28	.90
8719.00	92.18	359.34	8069.13	807.30	679.22	893.48	1055.02	40.08	1.75	-1.18
8814.00	92.35	359.20	8065.37	902.22	678.02	987.32	1128.58	36.92	.23	.18
8908.00	92.95	359.58	8061.03	996.11	677.02	1080.17	1204.40	34.20	.76	.64
9002.00	92.22	359.38	8056.79	1090.01	676.16	1173.05	1282.70	31.81	.81	-.78
9096.00	91.64	358.52	8053.62	1183.94	674.44	1265.84	1362.56	29.67	1.10	-.62
9191.00	91.84	359.03	8050.74	1278.87	672.41	1359.58	1444.87	27.73	.58	.21
9285.00	90.81	358.87	8048.56	1372.83	670.69	1452.40	1527.90	26.04	1.11	-1.10
9379.00	90.37	358.91	8047.60	1466.81	668.87	1545.22	1612.11	24.51	.47	-.47
9474.00	89.43	359.12	8047.76	1561.79	667.24	1639.07	1698.35	23.13	1.01	-.99
9568.00	90.03	359.37	8048.20	1655.78	666.00	1731.98	1784.70	21.91	.69	.64
9662.00	90.91	359.62	8047.43	1749.77	665.17	1824.96	1871.94	20.81	.97	.94
9756.00	89.87	.30	8046.79	1843.77	665.10	1918.04	1960.06	19.84	1.32	-1.11
9851.00	90.07	.65	8046.84	1938.77	665.89	2012.23	2049.93	18.96	.42	.21
9945.00	90.94	.98	8046.01	2032.75	667.23	2105.50	2139.46	18.17	.99	.93
10040.00	90.40	.41	8044.90	2127.74	668.38	2199.73	2230.25	17.44	.83	-.57
10134.00	89.70	359.61	8044.82	2221.74	668.40	2292.83	2320.10	16.74	1.13	-.74
10228.00	89.66	359.59	8045.35	2315.73	667.74	2385.83	2410.08	16.08	.05	-.04
10322.00	90.00	359.85	8045.63	2409.73	667.28	2478.86	2500.41	15.48	.46	.36
10416.00	90.34	.07	8045.35	2503.73	667.21	2571.95	2591.11	14.92	.43	.36
10511.00	90.80	.22	8044.40	2598.73	667.46	2666.06	2683.07	14.40	.51	.48
10606.00	89.87	359.69	8043.85	2693.72	667.38	2760.14	2775.16	13.92	1.13	-.98
10700.00	89.80	359.36	8044.12	2787.72	666.60	2853.12	2866.31	13.45	.36	-.07
10794.00	90.27	359.17	8044.06	2881.71	665.40	2946.05	2957.53	13.00	.54	.50
10888.00	90.91	358.92	8043.09	2975.69	663.83	3038.91	3048.84	12.58	.73	.68
10981.00	90.23	359.09	8042.17	3068.67	662.21	3130.77	3139.31	12.18	.75	-.73
11076.00	90.92	359.25	8041.21	3163.66	660.84	3224.65	3231.94	11.80	.75	.73
11170.00	90.10	358.28	8040.38	3257.63	658.81	3317.44	3323.58	11.43	1.35	-.87
11264.00	89.50	358.88	8040.70	3351.60	656.48	3410.19	3415.29	11.08	.90	-.64
11453.00	91.10	358.82	8039.71	3540.55	652.69	3596.80	3600.21	10.45	.85	.85
11547.00	89.96	359.34	8038.85	3634.53	651.18	3689.67	3692.41	10.16	1.33	-1.21
11641.00	88.72	359.61	8039.93	3728.52	650.32	3782.63	3784.81	9.89	1.35	-1.32
11736.00	89.33	.57	8041.54	3823.51	650.47	3876.73	3878.44	9.65	1.20	.64
11830.00	90.03	.82	8042.07	3917.50	651.61	3969.97	3971.32	9.44	.79	.74
11925.00	89.13	1.25	8042.77	4012.48	653.32	4064.28	4065.32	9.25	1.05	-.95
12019.00	89.53	1.54	8043.87	4106.44	655.61	4157.66	4158.45	9.07	.53	.43

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	BUILD RATE Deg/100
							Distance FT	Direction Deg		
12114.00	90.03	1.92	8044.23	4201.40	658.48	4252.09	4252.69	8.91	.66	.53
12208.00	90.84	2.25	8043.52	4295.33	661.90	4345.60	4346.03	8.76	.93	.86
12397.00	90.38	2.18	8041.50	4484.18	669.20	4533.64	4533.84	8.49	.25	-.24
12491.00	91.19	2.27	8040.22	4578.10	672.85	4627.16	4627.28	8.36	.87	.86
12560.00	91.83	2.62	8038.40	4647.01	675.80	4695.82	4695.90	8.27	1.06	.93

Projection to TD (Below 1' ; Right 17')

12620.00	92.39	2.92	8036.19	4706.90	678.69	4755.54	4755.58	8.20	1.06	.93
----------	-------	------	---------	---------	--------	---------	---------	------	------	-----