

Elevation Resources

Andrews County (NAD27)

University 1-26

#2H

Wellbore #1 Job #1412437

Design: Surveys (Latshaw 35)

Standard Survey Report

12 January, 2015

Survey Report

Company:	Elevation Resources	Local Co-ordinate Reference:	Well #2H
Project:	Andrews County (NAD27)	TVD Reference:	GL3137 + KB22 @ 3159.00usft (Latshaw 35)
Site:	University 1-26	MD Reference:	GL3137 + KB22 @ 3159.00usft (Latshaw 35)
Well:	#2H	North Reference:	Grid
Wellbore:	Wellbore #1 Job #1412437	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Latshaw 35)	Database:	Compass 5000 GCR

Project	Andrews County (NAD27)		
Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	Texas North Central 4202		

Site	University 1-26		
Site Position:		Northing:	226,045.60 usft
From:	Map	Easting:	447,938.00 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 11' 9.88882 N
		Longitude:	102° 31' 6.30903 W
		Grid Convergence:	-2.74 °

Well	#2H		
Well Position	+N/-S	0.00 usft	Northing: 226,045.60 usft
	+E/-W	0.00 usft	Easting: 447,938.00 usft
Position Uncertainty	0.00 usft	Wellhead Elevation:	0.00 usft
		Latitude:	32° 11' 9.88882 N
		Longitude:	102° 31' 6.30903 W
		Ground Level:	3,137.00 usft

Wellbore	Wellbore #1 Job #1412437				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010_14	11/30/2014	6.65	60.23	48,356

Design	Surveys (Latshaw 35)				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.00	0.00	0.00	157.83	

Survey Program	Date	1/12/2015			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
89.62	7,036.50	Phoenix Gyro Survey (Wellbore #1 Job #1	NS-GYRO-MS	North sensing gyrocompassing m/s	
7,052.00	14,154.00	Phoenix MWD Surveys (Wellbore #1 Job #	PHX+MWD+IGRF	PHX+MWD+IGRF v3:standard declination	

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
89.62	0.11	201.57	89.62	-0.08	-0.03	0.06	0.12	0.12	0.00	
184.78	0.64	116.51	184.78	-0.40	0.41	0.53	0.67	0.56	-89.39	
279.94	0.59	159.20	279.93	-1.10	1.06	1.42	0.47	-0.05	44.86	
375.10	0.54	164.15	375.09	-1.99	1.36	2.35	0.07	-0.05	5.20	
470.27	0.53	159.43	470.25	-2.83	1.63	3.24	0.05	-0.01	-4.96	
565.43	0.52	164.96	565.41	-3.66	1.90	4.11	0.05	-0.01	5.81	
660.59	0.61	162.03	660.57	-4.56	2.17	5.04	0.10	0.09	-3.08	
755.76	0.68	164.60	755.73	-5.58	2.47	6.11	0.08	0.07	2.70	
850.92	0.71	163.38	850.88	-6.69	2.79	7.25	0.04	0.03	-1.28	

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Design:	Surveys (Latshaw 35)	Database:	Compass 5000 GCR

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
946.08	0.69	162.11	946.04	-7.80	3.14	8.41	0.03	-0.02	-1.33
1,041.24	0.73	165.91	1,041.19	-8.94	3.46	9.58	0.06	0.04	3.99
1,136.41	0.76	172.07	1,136.35	-10.15	3.70	10.79	0.09	0.03	6.47
1,231.57	0.79	170.38	1,231.50	-11.42	3.89	12.05	0.04	0.03	-1.78
1,326.73	0.72	169.82	1,326.65	-12.66	4.11	13.27	0.07	-0.07	-0.59
1,421.90	0.55	165.91	1,421.82	-13.69	4.33	14.31	0.18	-0.18	-4.11
1,517.06	0.37	76.52	1,516.98	-14.06	4.74	14.81	0.69	-0.19	-93.94
1,612.22	0.67	357.56	1,612.13	-13.43	5.01	14.33	0.74	0.32	-82.98
1,707.38	1.01	242.12	1,707.29	-13.27	4.25	13.89	1.50	0.36	-121.31
1,802.55	1.12	170.14	1,802.44	-14.58	3.66	14.88	1.32	0.12	-75.63
1,897.71	1.43	84.18	1,897.59	-15.37	5.00	16.13	1.84	0.33	-90.33
1,992.87	1.53	22.31	1,992.72	-14.08	6.67	15.55	1.60	0.11	-65.02
2,088.03	1.61	316.79	2,087.85	-11.93	6.23	13.40	1.79	0.08	-68.85
2,183.20	1.30	256.55	2,183.00	-11.21	4.27	11.99	1.56	-0.33	-63.30
2,278.36	1.29	258.07	2,278.13	-11.68	2.17	11.63	0.04	-0.01	1.60
2,373.52	1.48	138.03	2,373.28	-12.81	1.94	12.60	2.52	0.20	-126.15
2,468.69	1.45	126.67	2,468.42	-14.45	3.73	14.79	0.31	-0.03	-11.94
2,563.85	1.66	337.93	2,563.56	-13.89	4.18	14.44	3.15	0.22	-156.31
2,659.01	1.57	314.06	2,658.69	-11.70	2.73	11.87	0.71	-0.09	-25.08
2,754.17	1.38	297.42	2,753.82	-10.27	0.77	9.80	0.49	-0.20	-17.49
2,849.34	1.24	261.39	2,848.96	-9.90	-1.26	8.69	0.86	-0.15	-37.86
2,944.50	1.19	222.55	2,944.10	-10.78	-2.95	8.87	0.85	-0.05	-40.82
3,039.66	1.20	181.81	3,039.24	-12.50	-3.65	10.20	0.87	0.01	-42.81
3,134.83	1.18	149.67	3,134.39	-14.34	-3.19	12.08	0.69	-0.02	-33.77
3,229.99	0.76	109.40	3,229.54	-15.40	-2.10	13.47	0.81	-0.44	-42.32
3,325.15	0.97	63.19	3,324.69	-15.25	-0.78	13.82	0.74	0.22	-48.56
3,420.31	1.12	351.15	3,419.84	-13.96	-0.21	12.85	1.30	0.16	-75.70
3,515.48	1.21	308.84	3,514.99	-12.41	-1.13	11.07	0.89	0.09	-44.46
3,610.64	1.18	258.34	3,610.13	-11.98	-2.87	10.01	1.07	-0.03	-53.07
3,705.80	1.32	207.23	3,705.27	-13.15	-4.34	10.55	1.14	0.15	-53.71
3,800.97	1.28	174.71	3,800.42	-15.19	-4.74	12.28	0.77	-0.04	-34.17
3,896.13	1.23	141.16	3,895.56	-17.04	-4.00	14.27	0.76	-0.05	-35.26
3,991.29	1.19	110.62	3,990.70	-18.18	-2.44	15.92	0.67	-0.04	-32.09
4,086.45	1.15	77.08	4,085.84	-18.32	-0.58	16.75	0.71	-0.04	-35.25
4,181.62	1.11	51.71	4,180.99	-17.53	1.07	16.64	0.52	-0.04	-26.66
4,276.78	1.04	18.69	4,276.14	-16.15	2.08	15.73	0.65	-0.07	-34.70
4,371.94	0.96	349.76	4,371.28	-14.54	2.21	14.30	0.53	-0.08	-30.40
4,467.10	1.24	258.07	4,466.43	-13.97	1.06	13.34	1.67	0.29	-96.35
4,562.27	1.20	266.80	4,561.58	-14.24	-0.94	12.83	0.20	-0.04	9.17
4,657.43	1.18	276.53	4,656.72	-14.18	-2.91	12.04	0.21	-0.02	10.22
4,752.59	1.13	282.26	4,751.86	-13.87	-4.80	11.04	0.13	-0.05	6.02
4,847.76	1.12	291.99	4,847.01	-13.33	-6.58	9.86	0.20	-0.01	10.22
4,942.92	1.09	301.72	4,942.15	-12.50	-8.21	8.48	0.20	-0.03	10.22

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5,038.08	0.99	337.45	5,037.30	-11.27	-9.30	6.92	0.68	-0.11	37.55	
5,228.41	0.75	322.17	5,227.61	-8.76	-10.69	4.08	0.17	-0.13	-8.03	
5,323.57	0.55	18.34	5,322.76	-7.84	-10.93	3.13	0.67	-0.21	59.03	
5,513.90	0.62	56.27	5,513.08	-6.40	-9.79	2.23	0.20	0.04	19.93	
5,704.22	0.57	72.37	5,703.39	-5.54	-8.03	2.10	0.09	-0.03	8.46	
5,894.55	0.41	89.06	5,893.72	-5.24	-6.44	2.42	0.11	-0.08	8.77	
5,989.71	0.47	87.64	5,988.87	-5.22	-5.71	2.68	0.06	0.06	-1.49	
6,084.87	0.39	98.34	6,084.03	-5.25	-5.00	2.98	0.12	-0.08	11.24	
6,180.03	0.30	85.78	6,179.19	-5.28	-4.43	3.22	0.12	-0.09	-13.20	
6,275.20	0.39	81.86	6,274.36	-5.22	-3.87	3.37	0.10	0.09	-4.12	
6,370.36	0.38	85.22	6,369.51	-5.14	-3.23	3.55	0.03	-0.01	3.53	
6,465.52	0.42	87.68	6,464.67	-5.10	-2.57	3.76	0.05	0.04	2.59	
6,560.69	0.49	89.43	6,559.84	-5.09	-1.81	4.03	0.07	0.07	1.84	
6,655.85	0.46	105.64	6,655.00	-5.19	-1.04	4.41	0.14	-0.03	17.03	
6,751.01	0.47	117.34	6,750.15	-5.47	-0.32	4.94	0.10	0.01	12.30	
6,846.17	1.26	150.36	6,845.30	-6.56	0.54	6.28	0.95	0.83	34.70	
6,941.34	3.08	144.76	6,940.40	-9.55	2.53	9.80	1.92	1.91	-5.88	
7,036.50	3.70	145.75	7,035.39	-14.18	5.74	15.30	0.65	0.65	1.04	
Tie-In to Phoenix Gyro Survey										
7,052.00	3.90	149.40	7,050.86	-15.05	6.29	16.31	2.02	1.29	23.55	
First Phoenix MWD Survey										
7,147.00	4.20	143.40	7,145.62	-20.62	10.01	22.87	0.55	0.32	-6.32	
7,242.00	3.50	140.10	7,240.41	-25.64	13.94	29.00	0.77	-0.74	-3.47	
7,337.00	3.00	150.80	7,335.25	-30.03	17.01	34.23	0.83	-0.53	11.26	
7,432.00	1.90	155.50	7,430.17	-33.64	18.88	38.27	1.18	-1.16	4.95	
7,527.00	2.20	148.40	7,525.11	-36.62	20.49	41.65	0.41	0.32	-7.47	
7,622.00	0.90	152.90	7,620.07	-38.84	21.78	44.19	1.37	-1.37	4.74	
7,717.00	0.70	144.60	7,715.06	-39.98	22.46	45.50	0.24	-0.21	-8.74	
7,812.00	0.80	129.60	7,810.05	-40.87	23.31	46.65	0.23	0.11	-15.79	
7,908.00	0.70	122.00	7,906.04	-41.61	24.32	47.71	0.15	-0.10	-7.92	
8,003.00	0.90	118.30	8,001.03	-42.27	25.47	48.76	0.22	0.21	-3.89	
8,098.00	0.80	146.10	8,096.02	-43.18	26.50	49.98	0.44	-0.11	29.26	
8,193.00	0.90	141.30	8,191.01	-44.31	27.33	51.35	0.13	0.11	-5.05	
8,288.00	2.10	153.70	8,285.98	-46.45	28.57	53.80	1.30	1.26	13.05	
8,382.00	1.20	150.40	8,379.94	-48.85	29.82	56.49	0.96	-0.96	-3.51	
8,477.00	1.50	138.10	8,474.91	-50.64	31.14	58.65	0.44	0.32	-12.95	
8,572.00	2.00	127.70	8,569.87	-52.58	33.28	61.25	0.62	0.53	-10.95	
8,667.00	0.80	108.30	8,664.84	-53.80	35.22	63.12	1.34	-1.26	-20.42	
8,762.00	1.20	93.20	8,759.82	-54.07	36.85	63.97	0.50	0.42	-15.89	
8,856.00	1.30	102.70	8,853.80	-54.36	38.87	65.01	0.24	0.11	10.11	
8,951.00	1.40	108.70	8,948.78	-54.97	41.02	66.38	0.18	0.11	6.32	
9,046.00	1.40	100.50	9,043.75	-55.55	43.26	67.77	0.21	0.00	-8.63	
9,141.00	1.10	105.70	9,138.72	-56.01	45.28	68.95	0.34	-0.32	5.47	
9,236.00	1.20	104.10	9,233.71	-56.50	47.12	70.10	0.11	0.11	-1.68	

Survey Report

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9,330.00	1.20	108.80	9,327.68	-57.05	49.01	71.33	0.10	0.00	5.00
9,425.00	1.40	118.00	9,422.66	-57.92	50.98	72.87	0.30	0.21	9.68
9,519.00	1.40	117.60	9,516.63	-58.99	53.01	74.63	0.01	0.00	-0.43
9,614.00	1.60	126.40	9,611.60	-60.31	55.10	76.65	0.32	0.21	9.26
9,709.00	2.30	122.40	9,706.54	-62.12	57.78	79.33	0.75	0.74	-4.21
9,802.00	2.30	126.40	9,799.47	-64.23	60.86	82.45	0.17	0.00	4.30
9,897.00	2.20	124.50	9,894.40	-66.39	63.89	85.60	0.13	-0.11	-2.00
9,992.00	2.60	131.60	9,989.31	-68.86	67.01	89.05	0.52	0.42	7.47
10,086.00	3.80	137.50	10,083.16	-72.57	70.71	93.89	1.32	1.28	6.28
10,181.00	5.00	134.50	10,177.88	-77.79	75.79	100.64	1.29	1.26	-3.16
10,276.00	6.10	135.60	10,272.44	-84.30	82.27	109.12	1.16	1.16	1.16
10,371.00	6.70	136.90	10,366.84	-91.95	89.59	118.96	0.65	0.63	1.37
10,466.00	7.20	137.10	10,461.15	-100.36	97.43	129.71	0.53	0.53	0.21
10,550.00	7.80	136.40	10,544.43	-108.35	104.94	139.94	0.72	0.71	-0.83
10,589.00	7.70	135.30	10,583.07	-112.12	108.61	144.82	0.46	-0.26	-2.82
10,652.00	8.40	140.40	10,645.45	-118.66	114.51	153.10	1.59	1.11	8.10
10,684.00	8.70	143.80	10,677.09	-122.42	117.43	157.68	1.84	0.94	10.63
10,715.00	9.40	149.00	10,707.71	-126.48	120.12	162.46	3.47	2.26	16.77
10,747.00	8.80	149.90	10,739.31	-130.84	122.69	167.47	1.93	-1.88	2.81
10,778.00	8.60	151.80	10,769.95	-134.93	124.97	172.12	1.13	-0.65	6.13
10,812.00	8.90	153.90	10,803.55	-139.53	127.33	177.27	1.29	0.88	6.18
10,843.00	10.80	152.70	10,834.10	-144.27	129.72	182.56	6.16	6.13	-3.87
10,875.00	14.60	149.40	10,865.31	-150.41	133.15	189.54	12.08	11.88	-10.31
10,906.00	19.10	149.10	10,894.97	-158.13	137.75	198.42	14.52	14.52	-0.97
10,938.00	20.70	147.60	10,925.06	-167.39	143.46	209.16	5.25	5.00	-4.69
10,969.00	22.00	149.50	10,953.93	-177.02	149.35	220.30	4.75	4.19	6.13
11,001.00	24.30	152.90	10,983.35	-188.05	155.39	232.79	8.31	7.19	10.63
11,033.00	27.60	155.90	11,012.12	-200.68	161.42	246.76	11.10	10.31	9.38
11,064.00	32.90	158.70	11,038.89	-215.09	167.41	262.37	17.69	17.10	9.03
11,096.00	37.90	159.00	11,064.97	-232.38	174.10	280.90	15.63	15.63	0.94
11,127.00	43.20	159.90	11,088.52	-251.25	181.16	301.04	17.20	17.10	2.90
11,159.00	45.00	161.80	11,111.50	-272.28	188.46	323.27	6.98	5.63	5.94
11,191.00	48.20	162.20	11,133.48	-294.39	195.64	346.46	10.04	10.00	1.25
11,222.00	52.90	161.30	11,153.17	-317.12	203.14	370.33	15.33	15.16	-2.90
11,254.00	57.50	160.20	11,171.43	-341.91	211.81	396.57	14.65	14.38	-3.44
11,285.00	62.70	158.40	11,186.88	-367.04	221.31	423.42	17.51	16.77	-5.81
11,317.00	67.30	156.20	11,200.40	-393.78	232.51	452.41	15.67	14.38	-6.88
11,349.00	71.90	154.80	11,211.55	-421.06	244.95	482.37	14.95	14.38	-4.38
11,380.00	77.10	153.50	11,219.84	-447.93	257.98	512.17	17.25	16.77	-4.19
11,412.00	82.60	153.40	11,225.47	-476.10	272.05	543.56	17.19	17.19	-0.31
11,473.00	92.30	155.20	11,228.18	-530.95	298.44	604.31	16.17	15.90	2.95
11,566.00	91.60	155.50	11,225.02	-615.42	337.21	697.17	0.82	-0.75	0.32
11,660.00	92.90	154.50	11,221.33	-700.55	376.90	790.98	1.74	1.38	-1.06

Survey Report

Company:	Elevation Resources	Local Co-ordinate Reference:	Well #2H
Project:	Andrews County (NAD27)	TVD Reference:	GL3137 + KB22 @ 3159.00usft (Latshaw 35)
Site:	University 1-26	MD Reference:	GL3137 + KB22 @ 3159.00usft (Latshaw 35)
Well:	#2H	North Reference:	Grid
Wellbore:	Wellbore #1 Job #1412437	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Latshaw 35)	Database:	Compass 5000 GCR

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
11,754.00	93.90	154.80	11,215.75	-785.34	417.07	884.67	1.11	1.06	0.32	
11,849.00	92.80	155.80	11,210.20	-871.50	456.70	979.41	1.56	-1.16	1.05	
11,942.00	92.40	155.40	11,205.98	-956.11	495.08	1,072.25	0.61	-0.43	-0.43	
12,037.00	91.80	155.60	11,202.50	-1,042.50	534.45	1,167.11	0.67	-0.63	0.21	
12,130.00	92.00	155.80	11,199.42	-1,127.21	572.70	1,259.99	0.30	0.22	0.22	
12,225.00	93.40	154.90	11,194.94	-1,213.45	612.28	1,354.79	1.75	1.47	-0.95	
12,319.00	92.90	154.80	11,189.78	-1,298.41	652.16	1,448.52	0.54	-0.53	-0.11	
12,413.00	94.00	157.80	11,184.12	-1,384.32	689.88	1,542.31	3.39	1.17	3.19	
12,506.00	95.70	159.80	11,176.26	-1,470.71	723.39	1,634.95	2.82	1.83	2.15	
12,601.00	95.40	159.90	11,167.07	-1,559.47	755.96	1,729.45	0.33	-0.32	0.11	
12,696.00	94.00	159.90	11,159.29	-1,648.39	788.49	1,824.06	1.47	-1.47	0.00	
12,793.00	92.30	159.90	11,153.96	-1,739.34	821.78	1,920.85	1.75	-1.75	0.00	
12,887.00	92.40	160.50	11,150.10	-1,827.70	853.59	2,014.69	0.65	0.11	0.64	
12,982.00	92.20	160.60	11,146.29	-1,917.21	885.20	2,109.51	0.24	-0.21	0.11	
13,077.00	90.60	162.00	11,143.97	-2,007.16	915.65	2,204.30	2.24	-1.68	1.47	
13,170.00	90.50	161.90	11,143.07	-2,095.58	944.46	2,297.05	0.15	-0.11	-0.11	
13,265.00	89.80	161.80	11,142.83	-2,185.86	974.05	2,391.82	0.74	-0.74	-0.11	
13,359.00	89.50	161.80	11,143.40	-2,275.15	1,003.41	2,485.59	0.32	-0.32	0.00	
13,453.00	89.00	161.60	11,144.63	-2,364.39	1,032.93	2,579.37	0.57	-0.53	-0.21	
13,547.00	88.50	162.30	11,146.68	-2,453.74	1,062.04	2,673.10	0.91	-0.53	0.74	
13,642.00	88.50	162.60	11,149.17	-2,544.29	1,090.68	2,767.76	0.32	0.00	0.32	
13,737.00	88.20	162.70	11,151.90	-2,634.93	1,119.00	2,862.39	0.33	-0.32	0.11	
13,831.00	88.30	162.50	11,154.77	-2,724.58	1,147.10	2,956.02	0.24	0.11	-0.21	
13,926.00	87.30	162.30	11,158.42	-2,815.07	1,175.80	3,050.64	1.07	-1.05	-0.21	
14,020.00	87.00	162.30	11,163.09	-2,904.51	1,204.34	3,144.24	0.32	-0.32	0.00	
14,100.00	86.70	161.90	11,167.49	-2,980.52	1,228.89	3,223.90	0.62	-0.38	-0.50	
Last Phoenix MWD Survey										
14,154.00	86.70	161.90	11,170.60	-3,031.76	1,245.64	3,277.67	0.00	0.00	0.00	
Projection to TD										

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
7,036.50	7,035.39	-14.18	5.74	Tie-In to Phoenix Gyro Survey	
7,052.00	7,050.86	-15.05	6.29	First Phoenix MWD Survey	
14,100.00	11,167.49	-2,980.52	1,228.89	Last Phoenix MWD Survey	
14,154.00	11,170.60	-3,031.76	1,245.64	Projection to TD	

Checked By: _____ Approved By: _____ Date: _____