



Celebrating 20 Years of Focused Solutions

3610 Elkins Road, Midland, Texas 79705 T. 432.684.0057 F. 432.686.7964 www.phxtech.com

January 29, 2018

Railroad Commission of Texas
Oil and Gas Division
P.O. Box 12967
Capitol Station
Austin, Texas 78711

Attention: Regulatory Department

Re: Piedra Operating
University 8-4 No. 9
Andrews County, Texas
API #42-003-47585
Job No. 62259

Enclosed please find the Survey Data Certification, and the original Plat and one copy of the Survey Report performed on the above referenced well by Phoenix Technology Services, Inc. (P-5 No. 664171). Other information required by your office is as follows:

Name & Title of Surveyor	Drain Hole Number	Surveyed Depths		Dates Performed		Type of Survey
		From	To	Start	End	
Oscar Velasquez	9	0	11,243	1/25/18	1/25/18	Gyro

A certified plat on which the bottom hole location is oriented both to the surface location and to the lease lines (or unit lines in case of pooling) is attached to the survey report. If any other information is required, please contact the undersigned at the letterhead address and phone number.

Best Regards,

Brittany Carley

Brittany Carley
Operations Administrator



Company: Piedra
 Well: University 8-4 No. 9
 Location: Andrews Co., Texas
 Rig: FBD 27

Job Number: 62259
 Grid Corr.: 2.10
 Lat: 32.394003
 Long: -102.344794

Date: 01-25-18
 Calculation Method: Minimum Curvature
 Proposed Azimuth: 346.95
 RKB - MSL in feet: 25
 Tie Into: Surface

Survey Tool Type	Survey Depth (ft)	Inclina- tion (deg)	Azimuth (deg)	Course Length (ft)	True Vertical Depth (ft)	Vertical Section (ft)	Coordinates		Closure		Dogleg Severity (d/100')	Build Rate (d/100')	Walk Rate (d/100')
							N/S (ft)	E/W (ft)	Distance (ft)	Angle (deg)			
Enter Tie-In Survey on Line 10													
FIELD COPY, NON-DEFINITIVE													
TIE IN	0			0	0	0	0	0					
Gyro	100.00	0.51	199.16	100	100.00	-0.38	0.42 S	0.15 W	0.45	199.16	0.51	0.51	199.16
	200.00	0.60	204.73	100	199.99	-1.17	1.32 S	0.51 W	1.41	201.22	0.10	0.09	5.57
	300.00	0.71	218.62	100	299.99	-1.97	2.28 S	1.12 W	2.54	206.14	0.19	0.11	13.89
	400.00	0.88	197.82	100	399.98	-3.01	3.49 S	1.74 W	3.90	206.47	0.33	0.17	-20.80
	500.00	1.08	289.99	100	499.97	-3.15	3.90 S	2.86 W	4.84	216.25	1.42	0.20	92.17
	600.00	1.05	199.38	100	599.96	-3.41	4.44 S	4.05 W	6.01	222.35	1.51	-0.03	-90.61
	700.00	1.02	167.81	100	699.94	-5.08	6.18 S	4.17 W	7.45	213.99	0.56	-0.03	-31.57
	800.00	0.93	167.39	100	799.93	-6.78	7.84 S	3.80 W	8.71	205.86	0.09	-0.09	-0.42
	900.00	1.18	155.00	100	899.91	-8.60	9.56 S	3.19 W	10.08	198.43	0.34	0.25	-12.39
	1000.00	1.30	155.33	100	999.89	-10.72	11.53 S	2.28 W	11.75	191.18	0.12	0.12	0.33
	1100.00	1.27	179.55	100	1099.86	-12.91	13.67 S	1.80 W	13.78	187.49	0.54	-0.03	24.22
	1200.00	1.36	142.55	100	1199.84	-15.07	15.72 S	1.07 W	15.75	183.88	0.84	0.09	-37.00
	1300.00	1.68	131.79	100	1299.80	-17.35	17.64 S	0.75 E	17.65	177.57	0.43	0.32	-10.76
	1400.00	1.42	153.49	100	1399.77	-19.75	19.72 S	2.39 E	19.87	173.08	0.64	-0.26	21.70
	1500.00	1.22	143.38	100	1499.74	-21.93	21.68 S	3.58 E	21.98	170.62	0.31	-0.20	-10.11
	1600.00	0.95	145.11	100	1599.72	-23.68	23.22 S	4.69 E	23.69	168.58	0.27	-0.27	1.73
	1700.00	0.69	92.05	100	1699.71	-24.61	23.92 S	5.77 E	24.61	166.45	0.77	-0.26	-53.06
	1800.00	0.51	186.77	100	1799.71	-25.18	24.38 S	6.32 E	25.19	165.48	0.89	-0.18	94.72
	1900.00	0.58	72.22	100	1899.71	-25.56	24.67 S	6.75 E	25.58	164.71	0.92	0.07	-114.55
	2000.00	0.67	34.54	100	1999.70	-25.12	24.04 S	7.56 E	25.20	162.54	0.41	0.09	-37.68
	2100.00	0.56	38.42	100	2099.70	-24.42	23.17 S	8.19 E	24.58	160.52	0.12	-0.11	3.88
	2200.00	0.55	15.87	100	2199.69	-23.70	22.33 S	8.63 E	23.94	158.87	0.22	-0.01	-22.55
	2300.00	0.64	16.87	100	2299.69	-22.79	21.33 S	8.92 E	23.12	157.30	0.09	0.09	1.00
	2400.00	0.72	307.95	100	2399.68	-21.82	20.41 S	8.59 E	22.14	157.18	0.77	0.08	291.08
	2500.00	0.46	77.50	100	2499.68	-21.34	19.94 S	8.49 E	21.67	156.94	1.07	-0.26	-230.45
	2600.00	0.44	208.91	100	2599.68	-21.63	20.19 S	8.69 E	21.98	156.70	0.82	-0.02	131.41
	2700.00	0.39	53.41	100	2699.68	-21.78	20.32 S	8.78 E	22.13	156.63	0.81	-0.05	-155.50
	2800.00	0.44	102.46	100	2799.67	-21.81	20.20 S	9.43 E	22.29	154.98	0.35	0.05	49.05
	2900.00	0.53	3.57	100	2899.67	-21.53	19.82 S	9.83 E	22.12	153.62	0.74	0.09	-98.89
	3000.00	0.57	141.21	100	2999.67	-21.53	19.75 S	10.17 E	22.21	152.74	1.03	0.04	137.64
	3100.00	0.34	335.35	100	3099.67	-21.69	19.86 S	10.36 E	22.40	152.46	0.90	-0.23	194.14



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Survey Tool Type	Survey Depth (ft)	Inclination (deg)	Azimuth (deg)	Course Length (ft)	True Vertical Depth (ft)	Vertical Section (ft)	Coordinates		Closure		Dogleg Severity (d/100')	Build Rate (d/100')	Walk Rate (d/100')
							N/S (ft)	E/W (ft)	Distance (ft)	Angle (deg)			
	3200.00	0.37	226.50	100	3199.67	-21.56	19.82 S	10.00 E	22.20	153.22	0.58	0.03	-108.85
	3300.00	0.64	66.21	100	3299.66	-21.62	19.81 S	10.28 E	22.32	152.58	1.00	0.27	-160.29
	3400.00	0.35	146.37	100	3399.66	-21.80	19.84 S	10.96 E	22.67	151.09	0.67	-0.29	80.16
	3500.00	0.31	113.48	100	3499.66	-22.25	20.20 S	11.38 E	23.19	150.62	0.19	-0.04	-32.89
	3600.00	0.38	212.47	100	3599.66	-22.65	20.59 S	11.45 E	23.56	150.93	0.53	0.07	98.99
	3700.00	0.35	123.63	100	3699.66	-23.10	21.04 S	11.52 E	23.99	151.29	0.51	-0.03	-88.84
	3800.00	0.28	233.35	100	3799.66	-23.42	21.36 S	11.58 E	24.29	151.53	0.52	-0.07	109.72
	3900.00	0.39	152.40	100	3899.66	-23.85	21.80 S	11.54 E	24.67	152.10	0.44	0.11	-80.95
	4000.00	0.25	281.03	100	3999.65	-24.09	22.06 S	11.49 E	24.87	152.50	0.58	-0.14	128.63
	4100.00	0.23	230.99	100	4099.65	-24.09	22.15 S	11.12 E	24.78	153.35	0.20	-0.02	-50.04
	4200.00	0.14	265.39	100	4199.65	-24.16	22.28 S	10.84 E	24.78	154.06	0.14	-0.09	34.40
	4300.00	0.26	105.58	100	4299.65	-24.25	22.36 S	10.94 E	24.89	153.93	0.39	0.12	-159.81
	4400.00	0.28	58.51	100	4399.65	-24.28	22.29 S	11.36 E	25.02	152.99	0.22	0.02	-47.07
	4500.00	0.36	339.47	100	4499.65	-23.89	21.87 S	11.46 E	24.69	152.34	0.41	0.08	280.96
	4600.00	0.43	33.80	100	4599.65	-23.32	21.26 S	11.56 E	24.20	151.47	0.37	0.07	-305.67
	4700.00	0.26	133.97	100	4699.65	-23.26	21.11 S	11.93 E	24.25	150.52	0.54	-0.17	100.17
	4800.00	0.36	127.41	100	4799.65	-23.69	21.45 S	12.34 E	24.75	150.09	0.11	0.10	-6.56
	4900.00	0.28	168.61	100	4899.64	-24.17	21.89 S	12.64 E	25.27	149.99	0.24	-0.08	41.20
	5000.00	0.36	205.08	100	4999.64	-24.67	22.41 S	12.56 E	25.69	150.74	0.21	0.08	36.47
	5100.00	0.40	163.11	100	5099.64	-25.26	23.03 S	12.52 E	26.21	151.46	0.27	0.04	-41.97
	5200.00	0.46	111.12	100	5199.64	-25.83	23.51 S	13.00 E	26.86	151.05	0.38	0.06	-51.99
	5300.00	0.46	95.61	100	5299.63	-26.19	23.69 S	13.77 E	27.40	149.82	0.12	0.00	-15.51
	5400.00	0.36	208.33	100	5399.63	-26.55	24.01 S	14.03 E	27.80	149.71	0.68	-0.10	112.72
	5500.00	0.41	124.49	100	5499.63	-27.05	24.49 S	14.17 E	28.29	149.94	0.52	0.05	-83.84
	5600.00	0.50	165.03	100	5599.63	-27.75	25.11 S	14.58 E	29.03	149.86	0.33	0.09	40.54
	5700.00	0.67	193.24	100	5699.62	-28.71	26.10 S	14.56 E	29.89	150.85	0.33	0.17	28.21
	5800.00	0.68	290.61	100	5799.62	-28.91	26.46 S	13.87 E	29.87	152.34	1.01	0.01	97.37
	5900.00	0.66	337.57	100	5899.61	-28.01	25.72 S	13.09 E	28.86	153.02	0.53	-0.02	46.96
	6000.00	0.40	11.51	100	5999.61	-27.13	24.84 S	12.94 E	28.01	152.48	0.40	-0.26	-326.06
	6100.00	0.41	39.56	100	6099.61	-26.59	24.23 S	13.24 E	27.61	151.34	0.20	0.01	28.05
	6200.00	0.35	308.97	100	6199.61	-26.13	23.76 S	13.23 E	27.19	150.89	0.54	-0.06	269.41
	6300.00	0.27	186.36	100	6299.60	-26.11	23.80 S	12.97 E	27.10	151.42	0.55	-0.08	-122.61
	6400.00	0.36	339.65	100	6399.60	-26.02	23.74 S	12.83 E	26.99	151.61	0.61	0.09	153.29
	6500.00	0.45	292.17	100	6499.60	-25.49	23.30 S	12.36 E	26.37	152.06	0.34	0.09	-47.48



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							N/S (ft)	E/W (ft)	Distance (ft)	Angle (deg)			
	6600.00	0.33	349.71	100	6599.60	-24.97	22.87 S	11.94 E	25.80	152.42	0.39	-0.12	57.54
	6700.00	0.34	351.19	100	6699.60	-24.39	22.29 S	11.85 E	25.24	152.01	0.01	0.01	1.48
	6800.00	0.20	98.48	100	6799.60	-24.16	22.02 S	11.97 E	25.07	151.47	0.44	-0.14	-252.71
	6900.00	0.25	335.50	100	6899.60	-24.01	21.85 S	12.06 E	24.95	151.11	0.40	0.05	237.02
	7000.00	0.22	144.45	100	6999.60	-23.97	21.81 S	12.08 E	24.93	151.02	0.47	-0.03	-191.05
	7100.00	0.20	286.20	100	7099.60	-24.06	21.91 S	12.02 E	25.00	151.25	0.40	-0.02	141.75
	7200.00	0.25	93.56	100	7199.60	-24.04	21.88 S	12.07 E	24.99	151.11	0.45	0.05	-192.64
	7300.00	0.37	166.39	100	7299.60	-24.43	22.21 S	12.37 E	25.42	150.89	0.38	0.12	72.83
	7400.00	0.57	158.59	100	7399.59	-25.24	22.98 S	12.62 E	26.22	151.22	0.21	0.20	-7.80
	7500.00	0.76	134.46	100	7499.59	-26.29	23.91 S	13.28 E	27.35	150.96	0.33	0.19	-24.13
	7600.00	0.93	176.09	100	7599.58	-27.65	25.19 S	13.81 E	28.72	151.27	0.62	0.17	41.63
	7700.00	1.00	155.18	100	7699.56	-29.31	26.79 S	14.23 E	30.33	152.02	0.36	0.07	-20.91
	7800.00	1.03	156.67	100	7799.55	-31.05	28.40 S	14.95 E	32.10	152.24	0.04	0.03	1.49
	7900.00	1.17	105.30	100	7899.53	-32.42	29.50 S	16.29 E	33.70	151.09	0.96	0.14	-51.37
	8000.00	0.81	191.13	100	7999.52	-33.55	30.46 S	17.14 E	34.95	150.64	1.37	-0.36	85.83
	8100.00	0.76	256.60	100	8099.51	-34.19	31.31 S	16.36 E	35.33	152.41	0.85	-0.05	65.47
	8200.00	0.31	275.46	100	8199.51	-34.11	31.44 S	15.44 E	35.03	153.84	0.48	-0.45	18.86
	8300.00	0.55	335.90	100	8299.50	-33.56	30.97 S	14.98 E	34.40	154.19	0.48	0.24	60.44
	8400.00	0.86	246.39	100	8399.50	-33.22	30.84 S	14.09 E	33.90	155.44	1.02	0.31	-89.51
	8500.00	1.16	224.64	100	8499.48	-33.90	31.86 S	12.70 E	34.29	158.27	0.48	0.30	-21.75
	8600.00	1.38	261.89	100	8599.46	-34.34	32.75 S	10.79 E	34.48	161.76	0.84	0.22	37.25
	8700.00	1.59	357.94	100	8699.44	-32.87	31.53 S	9.55 E	32.94	163.15	2.21	0.21	96.05
	8800.00	1.10	172.22	100	8799.43	-32.47	31.09 S	9.63 E	32.55	162.79	2.69	-0.49	-185.72
	8900.00	2.09	121.05	100	8899.39	-34.69	32.99 S	11.32 E	34.88	161.06	1.64	0.99	-51.17
	9000.00	2.62	110.38	100	8999.31	-37.22	34.72 S	15.03 E	37.83	156.60	0.69	0.53	-10.67
	9100.00	2.54	115.73	100	9099.21	-39.87	36.48 S	19.17 E	41.21	152.28	0.25	-0.08	5.35
	9200.00	2.54	107.68	100	9199.11	-42.39	38.12 S	23.27 E	44.66	148.59	0.36	0.00	-8.05
	9300.00	2.41	104.42	100	9299.02	-44.49	39.31 S	27.42 E	47.93	145.10	0.19	-0.13	-3.26
	9400.00	2.22	125.27	100	9398.94	-46.90	40.95 S	31.04 E	51.39	142.84	0.86	-0.19	20.85
	9500.00	2.24	103.03	100	9498.86	-49.21	42.51 S	34.52 E	54.77	140.92	0.86	0.02	-22.24
	9600.00	2.26	90.67	100	9598.79	-50.54	42.98 S	38.40 E	57.63	138.22	0.48	0.02	-12.36
	9700.00	2.25	86.49	100	9698.71	-51.33	42.88 S	42.33 E	60.25	135.37	0.16	-0.01	-4.18
	9800.00	2.05	94.81	100	9798.64	-52.20	42.91 S	46.07 E	62.96	132.96	0.37	-0.20	8.32
	9900.00	2.28	108.88	100	9898.57	-53.80	43.70 S	49.74 E	66.21	131.31	0.58	0.23	14.07



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							N/S (ft)	E/W (ft)	Distance (ft)	Angle (deg)			
	10000.00	2.15	138.50	100	9998.50	-56.51	45.75 S	52.86 E	69.91	130.88	1.14	-0.13	29.62
	10100.00	2.09	99.23	100	10098.43	-58.85	47.45 S	55.90 E	73.33	130.32	1.43	-0.06	-39.27
	10200.00	2.16	103.77	100	10198.36	-60.39	48.19 S	59.53 E	76.59	128.99	0.18	0.07	4.54
	10300.00	2.01	96.87	100	10298.30	-61.84	48.85 S	63.11 E	79.80	127.74	0.29	-0.15	-6.90
	10400.00	1.69	77.75	100	10398.25	-62.45	48.75 S	66.29 E	82.28	126.33	0.69	-0.32	-19.12
	10500.00	1.57	89.31	100	10498.21	-62.77	48.42 S	69.10 E	84.37	125.02	0.35	-0.12	11.56
	10600.00	1.44	99.53	100	10598.17	-63.54	48.61 S	71.71 E	86.63	124.13	0.30	-0.13	10.22
	10700.00	1.54	90.66	100	10698.14	-64.34	48.83 S	74.29 E	88.90	123.32	0.25	0.10	-8.87
	10800.00	1.52	94.07	100	10798.10	-65.05	48.94 S	76.96 E	91.20	122.45	0.09	-0.02	3.41
	10900.00	1.69	96.30	100	10898.06	-65.93	49.20 S	79.75 E	93.70	121.67	0.18	0.17	2.23
	11000.00	1.65	94.53	100	10998.02	-66.86	49.47 S	82.65 E	96.32	120.90	0.07	-0.04	-1.77
	11100.00	1.39	110.08	100	11097.99	-67.95	50.00 S	85.22 E	98.81	120.40	0.49	-0.26	15.55
	11200.00	1.54	97.98	100	11197.95	-69.10	50.61 S	87.69 E	101.25	119.99	0.34	0.15	-12.10
	11243.00	1.84	97.52	43	11240.94	-69.55	50.78 S	88.95 E	102.42	119.72	0.70	0.70	-1.07

SURVEY CERTIFICATION FORM

3610 Elkins Road Midland, TX 79705 t:432-684-0057 f: 432-686-7964



Company: Piedra
Well Name: University 8-4 No. 9
Survey Instrument Type: North Seek Rate Gyro

Job #: 62259
County/State: Andrews Co., Texas
API # 42-003-47585

TIE-IN DATA

Measure Depth (ft)	Vertical Depth (ft)	Inclination (°)	Azimuth (°)	N-S Coordinates	E-W Coordinates	Data Source
0	0	0	0	0	0	Surface

First Survey

Date	Depth (ft)	Inclination (°)	Azimuth (°)
2018-01-25	0	0	0

Last Survey

Date	Depth (ft)	Inclination (°)	Azimuth (°)
2018-01-25	11243	1.84	97.52

Projected TD Survey

Date	Depth (ft)	Inclination (°)	Azimuth (°)
0	0	0	0

Grid Correction
2.1

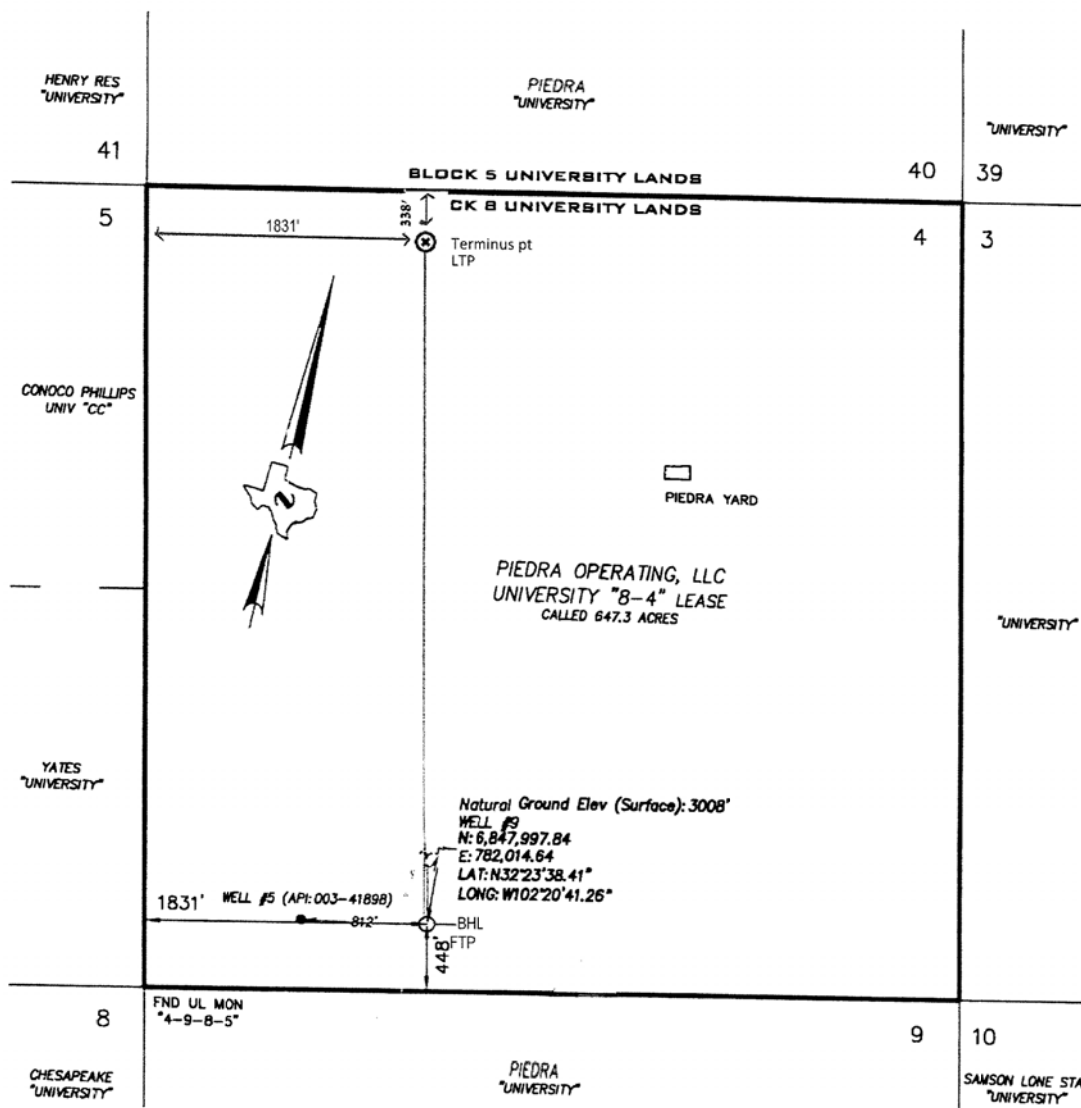
Gyro Operator: Phoenix Technology Services USA Ltd.
Gyro Supervisor: Angel Guebara

To the best of my knowledge I certify this survey data to be correct and true

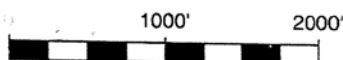
Date: 2018-01-25

Print Name: Oscar Velasquez

Signature: 



GRAPHIC SCALE



(IN FEET)
1 inch = 1000 ft.

NOTES:

- COURSES, DISTANCES, COORDINATES AND ACREAGE SHOWN HEREON ARE LAMBERT GRID AND CONFORM TO THE "TEXAS COORDINATE SYSTEM", TEXAS NORTH CENTRAL ZONE, NORTH AMERICAN DATUM OF 1983. ALL DISTANCES AND COORDINATES ARE SHOWN IN GRID FEET.
- DISTANCE TO THE NEAREST WELL IN THIS FIELD AS SHOWN.

DATED THIS 22ND DAY OF MAY, 2017

RJ DAUM
TEXAS RPLS 1826



SCHUMANN ENGINEERING CO., INC.

REGISTERED PROFESSIONAL LAND SURVEYORS

REGISTERED PROFESSIONAL CIVIL ENGINEERS

Civil Engineering ~ Land Surveying

TEXAS FIRM No. F1880

TEXAS FIRM No. 10149500

408 N. PECOS STREET - P. O. BOX 504
MIDLAND, TEXAS 79702-0504

Office (432) 684-5548
Fax (432) 684-6973

THIS WELL IS TO BE LOCATED 14.1 MILES IN A NORTHWEST DIRECTION FROM ANDREWS, TEXAS WHICH IS THE NEAREST TOWN IN THE COUNTY OF THE WELL SITE.

LOCATION PLAT

PIEDRA OPERATING, LLC

WELL NO. 9
UNIVERSITY "8-4" LEASE

448 FEET FROM THE SOUTH LINE AND
1831 FEET FROM THE WEST LINE

SECTION 4, BLOCK 8,
UNIVERSITY LANDS SURVEY,

ANDREWS COUNTY, TEXAS

QUAD: FIVE WELLS RANCH
SCALE: 1" = 1000'

PROJECT: 755623PO
JOB NO: 75623-B



Celebrating 20 Years of Focused Solutions

3610 Elkins Road, Midland, Texas 79705 T. 432.684.0057 F. 432.686.7964 www.phxtech.com

February 13, 2018

Railroad Commission of Texas
Oil and Gas Division
P.O. Box 12967
Capitol Station
Austin, Texas 78711

Attention: Regulatory Department

Re: Piedra Operating
University 8-4 #9
Andrew Co., Texas
API # 42-003-47585
Job No. 62181

Enclosed please find the Survey Data Certification, and the original Plat and one copy of the Survey Report performed on the above referenced well by Phoenix Technology Services, Inc. (P-5 No. 664171). Other information required by your office is as follows:

Name & Title of Surveyor	Drain Hole Number	Surveyed Depths		Dates Performed		Type of Survey
		From	To	Start	End	
Peter Mavrelis	9	8,985	19,104	1/27/18	2/5/18	MWD

A certified plat on which the bottom hole location is oriented both to the surface location and to the lease lines (or unit lines in case of pooling) is attached to the survey report. If any other information is required, please contact the undersigned at the letterhead address and phone number.

Best Regards,

Brittany Carley

Brittany Carley
Operations Administrator



Piedra Operating, LLC

Andrews County, TX (NAD83)

University 8-4

#9

ST01 / Job #62181

Survey: Phoenix MWD Surveys

Standard Survey Report

09 February, 2018

Survey Report

Company:	Piedra Operating, LLC	Local Co-ordinate Reference:	Well #9
Project:	Andrews County, TX (NAD83)	TVD Reference:	RKB @ 3033.00usft (Felderhoff 27)
Site:	University 8-4	MD Reference:	RKB @ 3033.00usft (Felderhoff 27)
Well:	#9	North Reference:	Grid
Wellbore:	ST01 / Job #62181	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Felderhoff 27)	Database:	USA Compass

Project	Andrews County, TX (NAD83)		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Texas North Central Zone		

Site	University 8-4		
Site Position:		Northing:	6,847,997.85 usft
From:	Map	Easting:	782,014.63 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 23' 38.41340 N
		Longitude:	102° 20' 41.26442 W
		Grid Convergence:	-2.10 °

Well	#9		
Well Position	+N/-S	0.00 usft	Northing: 6,847,997.85 usft
	+E/-W	0.00 usft	Easting: 782,014.63 usft
Position Uncertainty	0.00 usft	Wellhead Elevation:	0.00 usft
		Latitude:	32° 23' 38.41340 N
		Longitude:	102° 20' 41.26442 W
		Ground Level:	3,008.00 usft

Wellbore	ST01 / Job #62181				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	1/31/2018	6.30	60.18	47,903.60000000

Design	Surveys (Felderhoff 27)				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	8,900.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.00	0.00	0.00	346.95	

Survey Program	Date	2/9/2018			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
100.00	8,900.00	Phoenix Gyro Surveys (OH)	SPT_GTD	Continuous north-seeking gyro	
8,985.00	19,183.00	Phoenix MWD Surveys (ST01 / Job #62181)	MWD+HDGM	OWSG Rev.2 MWD + HDGM	

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)
8,900.00	2.09	121.05	8,899.39	-32.99	11.32	-34.69	0.00	0.00	0.00
Tie In to OH									
8,985.00	5.79	11.74	8,984.25	-29.58	13.53	-31.87	7.97	4.35	-128.60
First Phoenix MWD Survey - ST01									
9,032.00	8.54	6.20	9,030.88	-23.79	14.38	-26.43	6.03	5.85	-11.79
9,079.00	11.62	2.47	9,077.15	-15.59	14.97	-18.57	6.70	6.55	-7.94
9,127.00	14.87	358.47	9,123.87	-4.60	15.01	-7.87	7.03	6.77	-8.33
9,174.00	18.48	355.22	9,168.88	8.85	14.23	5.41	7.93	7.68	-6.91
9,221.00	21.16	355.35	9,213.09	24.73	12.92	21.18	5.70	5.70	0.28

Survey Report

Company:	Piedra Operating, LLC	Local Co-ordinate Reference:	Well #9
Project:	Andrews County, TX (NAD83)	TVD Reference:	RKB @ 3033.00usft (Felderhoff 27)
Site:	University 8-4	MD Reference:	RKB @ 3033.00usft (Felderhoff 27)
Well:	#9	North Reference:	Grid
Wellbore:	ST01 / Job #62181	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Felderhoff 27)	Database:	USA Compass

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)
9,268.00	24.50	353.72	9,256.41	42.88	11.16	39.25	7.23	7.11	-3.47
9,315.00	29.06	351.39	9,298.36	63.87	8.39	60.32	9.95	9.70	-4.96
9,363.00	33.59	349.24	9,339.35	88.45	4.16	85.23	9.72	9.44	-4.48
9,410.00	38.46	348.14	9,377.35	115.54	-1.27	112.85	10.45	10.36	-2.34
9,457.00	43.31	347.13	9,412.87	145.58	-7.87	143.60	10.41	10.32	-2.15
9,505.00	48.53	347.40	9,446.25	179.20	-15.47	178.07	10.88	10.88	0.56
9,552.00	52.93	347.70	9,476.00	214.73	-23.31	214.44	9.37	9.36	0.64
9,600.00	57.44	347.04	9,503.39	253.17	-31.93	253.84	9.46	9.40	-1.38
9,647.00	61.25	347.30	9,527.35	292.58	-40.90	294.26	8.12	8.11	0.55
9,694.00	65.01	345.50	9,548.59	333.32	-50.77	336.18	8.70	8.00	-3.83
9,740.00	68.45	345.15	9,566.76	374.19	-61.47	378.41	7.51	7.48	-0.76
9,788.00	70.77	345.02	9,583.49	417.67	-73.05	423.38	4.84	4.83	-0.27
9,835.00	74.53	345.37	9,597.50	461.03	-84.51	468.21	8.03	8.00	0.74
9,882.00	78.21	346.16	9,608.57	505.30	-95.74	513.87	8.00	7.83	1.68
9,929.00	81.65	345.94	9,616.79	550.20	-106.90	560.13	7.33	7.32	-0.47
9,977.00	85.50	346.03	9,622.16	596.47	-118.44	607.81	8.02	8.02	0.19
10,024.00	86.47	346.42	9,625.45	642.01	-129.61	654.69	2.22	2.06	0.83
10,118.00	91.33	348.40	9,627.25	733.70	-150.09	748.64	5.58	5.17	2.11
10,213.00	90.03	345.63	9,626.13	826.25	-171.43	843.62	3.22	-1.37	-2.92
10,307.00	87.79	343.83	9,627.92	916.91	-196.18	937.53	3.06	-2.38	-1.91
10,402.00	89.17	344.36	9,630.44	1,008.24	-222.20	1,032.37	1.56	1.45	0.56
10,497.00	92.65	346.56	9,628.93	1,100.16	-246.04	1,127.31	4.33	3.66	2.32
10,592.00	91.47	346.86	9,625.51	1,192.56	-267.87	1,222.24	1.28	-1.24	0.32
10,686.00	89.84	347.17	9,624.44	1,284.15	-288.99	1,316.23	1.77	-1.73	0.33
10,781.00	91.67	347.66	9,623.19	1,376.85	-309.68	1,411.22	1.99	1.93	0.52
10,875.00	93.09	347.44	9,619.28	1,468.56	-329.93	1,505.13	1.53	1.51	-0.23
10,969.00	89.25	346.16	9,617.36	1,560.04	-351.39	1,599.09	4.31	-4.09	-1.36
11,064.00	89.16	345.90	9,618.68	1,652.22	-374.32	1,694.07	0.29	-0.09	-0.27
11,159.00	89.79	345.50	9,619.55	1,744.27	-397.78	1,789.04	0.79	0.66	-0.42
11,253.00	89.98	344.27	9,619.74	1,835.02	-422.29	1,882.98	1.32	0.20	-1.31
11,348.00	90.10	344.01	9,619.67	1,926.40	-448.26	1,977.86	0.30	0.13	-0.27
11,442.00	89.60	342.56	9,619.92	2,016.42	-475.29	2,071.67	1.63	-0.53	-1.54
11,537.00	90.27	343.79	9,620.03	2,107.36	-502.79	2,166.46	1.47	0.71	1.29
11,632.00	90.50	346.82	9,619.39	2,199.24	-526.88	2,261.41	3.20	0.24	3.19
11,727.00	90.96	347.52	9,618.18	2,291.85	-547.98	2,356.40	0.88	0.48	0.74
11,821.00	91.57	348.18	9,616.10	2,383.73	-567.76	2,450.36	0.96	0.65	0.70
11,916.00	90.51	348.62	9,614.38	2,476.77	-586.86	2,545.31	1.21	-1.12	0.46
12,011.00	89.53	348.49	9,614.35	2,569.88	-605.71	2,640.28	1.04	-1.03	-0.14
12,105.00	89.75	348.49	9,614.94	2,661.99	-624.46	2,734.24	0.23	0.23	0.00
12,200.00	89.75	347.92	9,615.35	2,754.98	-643.88	2,829.22	0.60	0.00	-0.60
12,294.00	89.56	347.92	9,615.92	2,846.90	-663.55	2,923.20	0.20	-0.20	0.00
12,389.00	89.20	347.66	9,616.95	2,939.74	-683.64	3,018.19	0.47	-0.38	-0.27
12,484.00	88.49	346.03	9,618.86	3,032.23	-705.26	3,113.16	1.87	-0.75	-1.72

Survey Report

Company:	Piedra Operating, LLC	Local Co-ordinate Reference:	Well #9
Project:	Andrews County, TX (NAD83)	TVD Reference:	RKB @ 3033.00usft (Felderhoff 27)
Site:	University 8-4	MD Reference:	RKB @ 3033.00usft (Felderhoff 27)
Well:	#9	North Reference:	Grid
Wellbore:	ST01 / Job #62181	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Felderhoff 27)	Database:	USA Compass

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)
12,580.00	91.86	348.31	9,618.57	3,125.81	-726.57	3,209.14	4.24	3.51	2.38
12,674.00	92.27	349.90	9,615.18	3,218.05	-744.33	3,303.01	1.75	0.44	1.69
12,769.00	91.21	349.90	9,612.30	3,311.53	-760.98	3,397.84	1.12	-1.12	0.00
12,864.00	89.16	346.51	9,611.99	3,404.51	-780.39	3,492.80	4.17	-2.16	-3.57
12,958.00	87.98	345.28	9,614.33	3,495.64	-803.29	3,586.75	1.81	-1.26	-1.31
13,053.00	89.24	345.02	9,616.64	3,587.44	-827.63	3,681.67	1.35	1.33	-0.27
13,147.00	89.43	345.24	9,617.73	3,678.29	-851.75	3,775.62	0.31	0.20	0.23
13,242.00	89.02	344.58	9,619.01	3,770.00	-876.48	3,870.55	0.82	-0.43	-0.69
13,337.00	90.63	345.06	9,619.30	3,861.68	-901.36	3,965.48	1.77	1.69	0.51
13,431.00	87.30	343.04	9,621.00	3,952.03	-927.18	4,059.32	4.14	-3.54	-2.15
13,526.00	88.85	345.41	9,624.19	4,043.40	-952.99	4,154.15	2.98	1.63	2.49
13,620.00	91.72	347.13	9,623.73	4,134.69	-975.30	4,248.13	3.56	3.05	1.83
13,715.00	92.73	347.30	9,620.04	4,227.27	-996.30	4,343.06	1.08	1.06	0.18
13,810.00	91.44	347.17	9,616.58	4,319.86	-1,017.28	4,437.99	1.36	-1.36	-0.14
13,904.00	90.23	342.12	9,615.21	4,410.46	-1,042.16	4,531.87	5.52	-1.29	-5.37
13,999.00	88.35	342.82	9,616.39	4,501.04	-1,070.77	4,626.57	2.11	-1.98	0.74
14,094.00	90.06	346.47	9,617.71	4,592.62	-1,095.92	4,721.47	4.24	1.80	3.84
14,189.00	89.24	343.74	9,618.29	4,684.42	-1,120.33	4,816.41	3.00	-0.86	-2.87
14,284.00	92.00	348.14	9,617.26	4,776.53	-1,143.41	4,911.35	5.47	2.91	4.63
14,378.00	92.13	348.31	9,613.87	4,868.49	-1,162.58	5,005.27	0.23	0.14	0.18
14,473.00	93.98	348.45	9,608.81	4,961.41	-1,181.68	5,100.10	1.95	1.95	0.15
14,567.00	93.04	348.31	9,603.05	5,053.31	-1,200.58	5,193.89	1.01	-1.00	-0.15
14,662.00	91.39	348.23	9,599.38	5,146.25	-1,219.88	5,288.79	1.74	-1.74	-0.08
14,756.00	90.81	348.45	9,597.58	5,238.30	-1,238.87	5,382.75	0.66	-0.62	0.23
14,851.00	90.50	349.90	9,596.49	5,331.60	-1,256.71	5,477.67	1.56	-0.33	1.53
14,945.00	89.65	349.89	9,596.37	5,424.14	-1,273.21	5,571.54	0.90	-0.90	-0.01
15,040.00	90.93	351.96	9,595.89	5,517.94	-1,288.19	5,666.31	2.56	1.35	2.18
15,135.00	89.33	350.07	9,595.67	5,611.77	-1,303.02	5,761.06	2.61	-1.68	-1.99
15,229.00	89.37	350.29	9,596.74	5,704.38	-1,319.06	5,854.90	0.24	0.04	0.23
15,324.00	90.37	351.96	9,596.95	5,798.24	-1,333.71	5,949.65	2.05	1.05	1.76
15,419.00	89.95	349.85	9,596.69	5,892.04	-1,348.73	6,044.42	2.26	-0.44	-2.22
15,514.00	90.33	349.37	9,596.46	5,985.48	-1,365.86	6,139.31	0.64	0.40	-0.51
15,608.00	91.21	349.85	9,595.19	6,077.93	-1,382.81	6,233.20	1.07	0.94	0.51
15,703.00	89.47	349.11	9,594.63	6,171.33	-1,400.15	6,328.10	1.99	-1.83	-0.78
15,798.00	89.53	348.80	9,595.46	6,264.57	-1,418.35	6,423.04	0.33	0.06	-0.33
15,892.00	88.42	345.46	9,597.14	6,356.18	-1,439.28	6,517.01	3.74	-1.18	-3.55
15,987.00	88.62	344.84	9,599.59	6,447.97	-1,463.62	6,611.93	0.69	0.21	-0.65
16,081.00	89.82	346.20	9,600.87	6,538.97	-1,487.12	6,705.89	1.93	1.28	1.45
16,175.00	90.93	345.81	9,600.26	6,630.18	-1,509.86	6,799.87	1.25	1.18	-0.41
16,270.00	91.39	346.16	9,598.34	6,722.33	-1,532.86	6,894.84	0.61	0.48	0.37
16,365.00	92.43	347.74	9,595.17	6,814.82	-1,554.30	6,989.78	1.99	1.09	1.66
16,460.00	91.32	346.29	9,592.06	6,907.34	-1,575.63	7,084.73	1.92	-1.17	-1.53
16,554.00	92.07	345.81	9,589.28	6,998.53	-1,598.28	7,178.67	0.95	0.80	-0.51
16,649.00	90.90	344.89	9,586.82	7,090.41	-1,622.30	7,273.60	1.57	-1.23	-0.97

Survey Report

Company:	Piedra Operating, LLC	Local Co-ordinate Reference:	Well #9
Project:	Andrews County, TX (NAD83)	TVD Reference:	RKB @ 3033.00usft (Felderhoff 27)
Site:	University 8-4	MD Reference:	RKB @ 3033.00usft (Felderhoff 27)
Well:	#9	North Reference:	Grid
Wellbore:	ST01 / Job #62181	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Felderhoff 27)	Database:	USA Compass

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)
16,743.00	87.73	343.83	9,587.94	7,180.91	-1,647.64	7,367.49	3.56	-3.37	-1.13
16,838.00	89.55	345.63	9,590.20	7,272.52	-1,672.65	7,462.38	2.69	1.92	1.89
16,932.00	89.94	344.32	9,590.62	7,363.30	-1,697.01	7,556.32	1.45	0.41	-1.39
17,027.00	90.84	343.57	9,589.97	7,454.59	-1,723.29	7,651.19	1.23	0.95	-0.79
17,122.00	88.51	342.51	9,590.51	7,545.45	-1,750.99	7,745.96	2.69	-2.45	-1.12
17,216.00	91.15	344.18	9,590.79	7,635.50	-1,777.93	7,839.76	3.32	2.81	1.78
17,311.00	91.25	346.25	9,588.80	7,727.33	-1,802.17	7,934.69	2.18	0.11	2.18
17,405.00	92.93	346.38	9,585.37	7,818.59	-1,824.39	8,028.62	1.79	1.79	0.14
17,500.00	91.98	347.44	9,581.30	7,911.04	-1,845.89	8,123.53	1.50	-1.00	1.12
17,594.00	91.71	348.01	9,578.27	8,002.84	-1,865.86	8,217.47	0.67	-0.29	0.61
17,689.00	89.95	348.67	9,576.90	8,095.87	-1,885.06	8,312.43	1.98	-1.85	0.69
17,783.00	91.29	349.02	9,575.88	8,188.08	-1,903.24	8,406.37	1.47	1.43	0.37
17,878.00	89.78	348.98	9,574.99	8,281.33	-1,921.37	8,501.30	1.59	-1.59	-0.04
17,973.00	90.12	349.72	9,575.08	8,374.69	-1,938.93	8,596.22	0.86	0.36	0.78
18,068.00	88.59	348.97	9,576.15	8,468.05	-1,956.49	8,691.12	1.79	-1.61	-0.79
18,163.00	89.12	349.28	9,578.04	8,561.32	-1,974.41	8,786.04	0.65	0.56	0.33
18,257.00	91.47	349.50	9,577.56	8,653.71	-1,991.71	8,879.94	2.51	2.50	0.23
18,352.00	90.45	348.09	9,575.97	8,746.88	-2,010.17	8,974.88	1.83	-1.07	-1.48
18,447.00	88.86	346.38	9,576.54	8,839.52	-2,031.16	9,069.87	2.46	-1.67	-1.80
18,540.00	90.70	347.35	9,576.90	8,930.08	-2,052.29	9,162.86	2.24	1.98	1.04
18,632.00	89.04	347.08	9,577.11	9,019.80	-2,072.65	9,254.86	1.83	-1.80	-0.29
18,725.00	88.03	348.01	9,579.48	9,110.58	-2,092.70	9,347.82	1.48	-1.09	1.00
18,818.00	89.17	348.09	9,581.76	9,201.54	-2,111.95	9,440.77	1.23	1.23	0.09
18,911.00	89.55	347.79	9,582.79	9,292.48	-2,131.38	9,533.75	0.52	0.41	-0.32
19,004.00	89.52	346.95	9,583.55	9,383.22	-2,151.72	9,626.75	0.90	-0.03	-0.90
19,097.00	89.33	345.72	9,584.48	9,473.58	-2,173.68	9,719.73	1.34	-0.20	-1.32
19,104.00	89.28	345.50	9,584.57	9,480.36	-2,175.42	9,726.73	3.22	-0.71	-3.14
Final Phoenix MWD Survey - ST01									
19,183.00	89.28	345.50	9,585.56	9,556.84	-2,195.21	9,805.70	0.00	0.00	0.00
Projection to TD - ST01									

Survey Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
8,900.00	8,899.39	-32.99	11.32	Tie In to OH
8,985.00	8,984.25	-29.58	13.53	First Phoenix MWD Survey - ST01
19,104.00	9,584.57	9,480.36	-2,175.42	Final Phoenix MWD Survey - ST01
19,183.00	9,585.56	9,556.84	-2,195.21	Projection to TD - ST01

Phoenix Technology Services
SURVEY DATA CERTIFICATION



PHOENIX JOB NUMBER

62181

ENERGY COMPANY

Piedra Operating, LLC

WELL NAME

University 8-4 #9

COUNTY & STATE

Andrew, Texas

API WELL NUMBER

42-003-47585

PROPOSED DIRECTION

346.95

TIE-IN DATA						
MEASURED DEPTH	VERTICAL DEPTH	INCLIN	AZIMUTH	N-S COORD	E-W COORD	DATA SOURCE
8,900. ft	8,899.39 ft	2.09	121.05	-32.99 ft	11.32 ft	Surface

FIRST SURVEY DATE	FIRST SURVEY DEPTH	INCLIN	AZIMUTH
27-Jan-18	8,985.00 ft	5.79	11.74

SURVEY INSTRUMENT
TYPE

Phoenix MWD Velocity

LAST SURVEY DATE	LAST SURVEY DEPTH	INCLIN	AZIMUTH
5-Feb-18	19,104.00 ft	89.28	345.50

TO THE BEST OF MY KNOWLEDGE I
CERTIFY THIS SURVEY DATA TO BE
TRUE AND CORRECT.

PROJECTED TD SURVEY DATE	PROJECTED TD SURVEY DEPTH	INCLIN	AZIMUTH
5-Feb-18	19,183.00 ft	89.28	345.50

Peter Mavrelis

PRINT YOUR NAME ABOVE

Peter Mavrelis

SIGN YOUR NAME ABOVE

MAGNETIC DECLINATION OR TOTAL GRID

TOTAL CORRECTION USED	8.4
DECLINATION OR GRID	GRID

2/6/2018

TODAY'S DATE

MWD SUPERVISOR 1

Peter Mavrelis

DIRECTIONAL DRILLER 1

Steve Sheffield

MWD SUPERVISOR 2

Stefan Bowman

DIRECTIONAL DRILLER 2

Jeffrey Shroer

12329 Cutten Rd., Houston, Texas 777066 (713)337-0600 (Voice), (713)337-0599 (Fax)

