



2105 MARKET STREET  
MIDLAND, TX 79703  
24 HR (432) 694-9517

STATE OF TEXAS

COUNTY OF Loving

I, John Hollis, Directional Driller certify that I am employed by Baker Hughes INTEQ; did conduct or supervise on the day(s) of Mar 3, 2013 through Mar 14, 2013 the taking of MWD surveys from a depth of 11,332 to a depth of 15,800 that the data is true, correct, complete and within the limitations of the tool as set forth by Baker Hughes INTEQ; that I am authorized and qualified to make this report; that this survey was conducted at the request of Energen for the University 8-19 #2 Well, API No. 42-301-31855 in Loving County, TX; and that I have reviewed this report and find that it conforms to the principles and procedures as set forth by INTEQ.

*Byron D. Dutz (Well Planner)*

Field Service Engineer: John Hollis

# Actual Wellpath Report

No. 2 AWP

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## REFERENCE WELLPATH IDENTIFICATION

Operator	<b>Energgen Resources</b>	Slot	<b>No. 2 SHL</b>
Area	<b>Loving County, TX</b>	Well	<b>No. 2</b>
Field	<b>(University) Sec 8, Blk 19, ULS</b>	Wellbore	<b>No. 2 AWB</b>
Facility	<b>University 8-19 No.2</b>		

## REPORT SETUP INFORMATION

Projection System	<b>NAD27 / Lambert Texas SP, Central Zone (4203), US feet</b>	Software System	<b>WellArchitect® 3.0.0</b>
North Reference	<b>Grid</b>	User	<b>Harrkol</b>
Scale	<b>0.999957</b>	Report Generated	<b>3/14/2013 at 9:11:49 AM</b>
Convergence at slot	<b>1.60° West</b>	Database/Source file	<b>WA Midland/No._2_AWB.xml</b>

## WELLPATH LOCATION

	Local coordinates		Grid coordinates		Geographic coordinates	
	North[ft]	East[ft]	Easting[US ft]	Northing[US ft]	Latitude	Longitude
Slot Location	<b>0.00</b>	<b>0.00</b>	1036283.80	754945.20	31°42'19.849"N	103°25'57.135"W
Facility Reference Pt			<b>1036283.80</b>	<b>754945.20</b>	31°42'19.849"N	103°25'57.135"W
Field Reference Pt			<b>0.00</b>	<b>0.00</b>	29°30'40.258"N	106°37'21.437"W

## WELLPATH DATUM

Calculation method	<b>Minimum curvature</b>	Rig on No. 2 SHL (KB) to Facility Vertical Datum	<b>30.00ft</b>
Horizontal Reference Pt	<b>Slot</b>	Rig on No. 2 SHL (KB) to Mean Sea Level	<b>2769.00ft</b>
Vertical Reference Pt	<b>Rig on No. 2 SHL (KB)</b>	Rig on No. 2 SHL (KB) to Mud Line at Slot (No. 2 SHL)	<b>30.00ft</b>
MD Reference Pt	<b>Rig on No. 2 SHL (KB)</b>	Section Origin	<b>N 0.00, E 0.00 ft</b>
Field Vertical Reference	<b>Mean Sea Level</b>	Section Azimuth	<b>163.73°</b>

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Area	Loving County, TX	Well	No. 2
Field	(University) Sec 8, Blk 19, ULS	Wellbore	No. 2 AWB
Facility	University 8-19 No.2		

## WELLPATH DATA (184 stations)

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	DLS [°/100ft]	Comments
0.00	0.000	276.170	0.00	0.00	0.00	0.00	1036283.80	754945.20	31°42'19.849"N	103°25'57.135"W	0.00	
100.00	0.190	276.170	100.00	-0.06	0.02	-0.16	1036283.64	754945.22	31°42'19.849"N	103°25'57.137"W	0.19	
200.00	0.390	192.330	200.00	0.17	-0.30	-0.40	1036283.40	754944.90	31°42'19.846"N	103°25'57.140"W	0.42	
300.00	0.370	199.650	300.00	0.73	-0.93	-0.58	1036283.22	754944.27	31°42'19.840"N	103°25'57.142"W	0.05	
400.00	0.350	206.960	399.99	1.22	-1.51	-0.83	1036282.97	754943.69	31°42'19.834"N	103°25'57.144"W	0.05	
500.00	0.580	213.600	499.99	1.77	-2.20	-1.25	1036282.55	754943.00	31°42'19.827"N	103°25'57.149"W	0.24	
600.00	0.820	220.240	599.98	2.49	-3.17	-1.99	1036281.81	754942.03	31°42'19.817"N	103°25'57.157"W	0.25	
700.00	0.700	227.240	699.97	3.15	-4.13	-2.90	1036280.90	754941.07	31°42'19.807"N	103°25'57.168"W	0.15	
800.00	0.580	234.240	799.97	3.59	-4.84	-3.76	1036280.04	754940.36	31°42'19.800"N	103°25'57.177"W	0.14	
900.00	0.720	242.930	899.96	3.88	-5.42	-4.73	1036279.07	754939.78	31°42'19.794"N	103°25'57.188"W	0.17	
1000.00	0.870	251.610	999.95	4.03	-5.95	-6.01	1036277.79	754939.25	31°42'19.788"N	103°25'57.203"W	0.19	
1100.00	0.610	231.970	1099.94	4.25	-6.52	-7.15	1036276.65	754938.68	31°42'19.783"N	103°25'57.216"W	0.36	
1200.00	0.360	212.330	1199.94	4.66	-7.11	-7.74	1036276.06	754938.09	31°42'19.777"N	103°25'57.223"W	0.30	
1300.00	0.340	178.330	1299.94	5.15	-7.67	-7.90	1036275.90	754937.53	31°42'19.771"N	103°25'57.224"W	0.21	
1400.00	0.330	144.330	1399.94	5.71	-8.20	-7.72	1036276.08	754937.00	31°42'19.766"N	103°25'57.222"W	0.20	
1500.00	0.400	140.250	1499.94	6.30	-8.71	-7.33	1036276.47	754936.49	31°42'19.761"N	103°25'57.217"W	0.07	
1600.00	0.470	144.170	1599.93	7.01	-9.31	-6.87	1036276.93	754935.89	31°42'19.755"N	103°25'57.212"W	0.08	
1700.00	0.470	67.940	1699.93	7.35	-9.49	-6.25	1036277.55	754935.72	31°42'19.753"N	103°25'57.204"W	0.58	
1800.00	0.480	351.700	1799.93	6.90	-8.92	-5.93	1036277.87	754936.28	31°42'19.759"N	103°25'57.201"W	0.59	
1900.00	0.490	326.580	1899.92	6.08	-8.15	-6.22	1036277.58	754937.06	31°42'19.767"N	103°25'57.205"W	0.21	
2000.00	0.500	301.450	1999.92	5.34	-7.56	-6.83	1036276.97	754937.64	31°42'19.772"N	103°25'57.212"W	0.22	
2100.00	0.740	307.270	2099.91	4.50	-6.94	-7.72	1036276.08	754938.26	31°42'19.778"N	103°25'57.222"W	0.25	
2200.00	0.980	313.080	2199.90	3.25	-5.97	-8.86	1036274.94	754939.23	31°42'19.788"N	103°25'57.236"W	0.26	
2300.00	0.940	316.360	2299.89	1.78	-4.79	-10.05	1036273.75	754940.41	31°42'19.799"N	103°25'57.250"W	0.07	
2400.00	0.890	312.640	2399.88	0.39	-3.67	-11.18	1036272.62	754941.53	31°42'19.810"N	103°25'57.263"W	0.08	
2500.00	1.040	12.330	2499.86	-1.07	-2.26	-11.56	1036272.24	754942.94	31°42'19.823"N	103°25'57.268"W	0.97	
2600.00	1.190	59.010	2599.85	-2.13	-0.84	-10.48	1036273.32	754944.36	31°42'19.838"N	103°25'57.256"W	0.89	
2700.00	1.140	46.580	2699.83	-2.85	0.38	-8.86	1036274.94	754945.58	31°42'19.850"N	103°25'57.238"W	0.26	
2800.00	1.080	14.150	2799.81	-4.12	1.98	-7.91	1036275.89	754947.18	31°42'19.866"N	103°25'57.227"W	0.62	
2900.00	0.980	349.350	2899.79	-5.78	3.73	-7.84	1036275.96	754948.93	31°42'19.884"N	103°25'57.227"W	0.45	

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Field	<b>(University) Sec 8, Blk 19, ULS</b>	Wellbore	<b>No. 2 AWB</b>
Facility	<b>University 8-19 No.2</b>		

## WELLPATH DATA (184 stations)

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	DLS [°/100ft]	Comments
3000.00	0.890	324.560	2999.78	-7.37	5.21	-8.45	1036275.35	754950.41	31°42'19.898"N	103°25'57.235"W	0.41	
3100.00	0.620	25.820	3099.77	-8.50	6.33	-8.66	1036275.14	754951.53	31°42'19.909"N	103°25'57.238"W	0.80	
3200.00	0.350	87.080	3199.77	-8.83	6.83	-8.12	1036275.68	754952.03	31°42'19.914"N	103°25'57.231"W	0.55	
3300.00	0.930	80.730	3299.76	-8.66	6.98	-7.02	1036276.78	754952.18	31°42'19.916"N	103°25'57.219"W	0.58	
3400.00	1.500	74.380	3399.74	-8.55	7.46	-4.95	1036278.85	754952.66	31°42'19.921"N	103°25'57.195"W	0.58	
3500.00	1.170	51.070	3499.71	-8.93	8.45	-2.90	1036280.90	754953.65	31°42'19.932"N	103°25'57.172"W	0.63	
3600.00	0.840	27.760	3599.70	-9.85	9.74	-1.76	1036282.04	754954.94	31°42'19.945"N	103°25'57.159"W	0.52	
3700.00	0.450	66.240	3699.69	-10.43	10.55	-1.06	1036282.74	754955.75	31°42'19.953"N	103°25'57.151"W	0.56	
3800.00	0.070	104.710	3799.69	-10.45	10.69	-0.64	1036283.16	754955.89	31°42'19.955"N	103°25'57.146"W	0.40	
3900.00	0.790	84.150	3899.69	-10.29	10.75	0.10	1036283.90	754955.95	31°42'19.955"N	103°25'57.138"W	0.72	
4000.00	1.510	63.600	3999.67	-10.40	11.40	1.97	1036285.77	754956.60	31°42'19.962"N	103°25'57.116"W	0.82	
4100.00	1.140	24.710	4099.64	-11.38	12.89	3.56	1036287.36	754958.09	31°42'19.978"N	103°25'57.098"W	0.95	
4200.00	0.780	327.820	4199.63	-12.78	14.37	3.62	1036287.42	754959.57	31°42'19.992"N	103°25'57.098"W	0.97	
4300.00	0.490	278.600	4299.63	-13.62	15.01	2.83	1036286.63	754960.21	31°42'19.998"N	103°25'57.107"W	0.59	
4400.00	0.210	231.390	4399.62	-13.73	14.96	2.26	1036286.06	754960.16	31°42'19.998"N	103°25'57.114"W	0.38	
4500.00	0.540	154.260	4499.62	-13.20	14.42	2.33	1036286.13	754959.62	31°42'19.992"N	103°25'57.113"W	0.53	
4600.00	0.870	77.130	4599.62	-12.69	14.17	3.27	1036287.07	754959.37	31°42'19.990"N	103°25'57.102"W	0.92	
4700.00	0.920	79.750	4699.60	-12.56	14.48	4.80	1036288.60	754959.68	31°42'19.994"N	103°25'57.084"W	0.06	
4800.00	0.960	82.370	4799.59	-12.35	14.74	6.42	1036290.22	754959.93	31°42'19.997"N	103°25'57.066"W	0.06	
4900.00	0.840	84.590	4899.58	-12.08	14.92	7.98	1036291.78	754960.12	31°42'19.999"N	103°25'57.048"W	0.12	
5000.00	0.720	86.820	4999.57	-11.80	15.02	9.34	1036293.14	754960.22	31°42'20.000"N	103°25'57.032"W	0.12	
5100.00	0.740	101.190	5099.56	-11.36	14.93	10.60	1036294.40	754960.13	31°42'20.000"N	103°25'57.017"W	0.18	
5200.00	0.750	115.570	5199.55	-10.63	14.52	11.82	1036295.62	754959.72	31°42'19.996"N	103°25'57.003"W	0.19	
5300.00	0.850	125.020	5299.54	-9.61	13.81	13.02	1036296.82	754959.01	31°42'19.989"N	103°25'56.989"W	0.17	
5400.00	0.960	134.460	5399.53	-8.30	12.80	14.23	1036298.03	754958.00	31°42'19.980"N	103°25'56.975"W	0.18	
5500.00	0.930	135.540	5499.52	-6.86	11.63	15.39	1036299.19	754956.83	31°42'19.968"N	103°25'56.961"W	0.03	
5600.00	0.900	136.620	5599.50	-5.44	10.48	16.50	1036300.30	754955.68	31°42'19.957"N	103°25'56.948"W	0.03	
5700.00	0.700	139.080	5699.49	-4.19	9.45	17.44	1036301.24	754954.65	31°42'19.947"N	103°25'56.937"W	0.20	
5800.00	0.490	141.530	5799.49	-3.24	8.66	18.11	1036301.91	754953.86	31°42'19.940"N	103°25'56.929"W	0.21	
5900.00	0.590	153.280	5899.48	-2.33	7.86	18.60	1036302.40	754953.06	31°42'19.932"N	103°25'56.923"W	0.15	

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Operator	<b>Energen Resources</b>	Slot	<b>No. 2 SHL</b>
Area	<b>Loving County, TX</b>	Well	<b>No. 2</b>
Field	<b>(University) Sec 8, Blk 19, ULS</b>	Wellbore	<b>No. 2 AWB</b>
Facility	<b>University 8-19 No.2</b>		

## WELLPATH DATA (184 stations)

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	DLS [°/100ft]	Comments
6000.00	0.690	165.030	5999.48	-1.23	6.82	18.99	1036302.79	754952.02	31°42'19.922"N	103°25'56.918"W	0.16	
6100.00	0.650	154.590	6099.47	-0.06	5.73	19.39	1036303.19	754950.93	31°42'19.911"N	103°25'56.913"W	0.13	
6200.00	0.600	144.150	6199.46	0.99	4.79	19.94	1036303.74	754949.99	31°42'19.902"N	103°25'56.906"W	0.12	
6300.00	0.560	148.870	6299.46	1.96	3.95	20.50	1036304.30	754949.15	31°42'19.894"N	103°25'56.899"W	0.06	
6400.00	0.520	153.580	6399.46	2.87	3.12	20.95	1036304.75	754948.32	31°42'19.886"N	103°25'56.894"W	0.06	
6500.00	0.350	136.470	6499.45	3.59	2.49	21.37	1036305.16	754947.69	31°42'19.880"N	103°25'56.889"W	0.21	
6600.00	0.180	119.350	6599.45	3.98	2.20	21.71	1036305.51	754947.40	31°42'19.877"N	103°25'56.885"W	0.19	
6700.00	0.250	169.640	6699.45	4.31	1.90	21.89	1036305.69	754947.10	31°42'19.874"N	103°25'56.883"W	0.19	
6800.00	0.310	219.920	6799.45	4.67	1.48	21.75	1036305.55	754946.68	31°42'19.870"N	103°25'56.884"W	0.24	
6900.00	0.460	214.620	6899.45	5.08	0.94	21.35	1036305.15	754946.14	31°42'19.864"N	103°25'56.888"W	0.15	
7000.00	0.610	209.330	6999.44	5.70	0.15	20.86	1036304.66	754945.35	31°42'19.856"N	103°25'56.894"W	0.16	
7100.00	0.670	208.030	7099.44	6.49	-0.83	20.33	1036304.13	754944.37	31°42'19.846"N	103°25'56.900"W	0.06	
7200.00	0.730	206.730	7199.43	7.38	-1.92	19.77	1036303.57	754943.28	31°42'19.835"N	103°25'56.906"W	0.06	
7300.00	0.790	209.880	7299.42	8.32	-3.08	19.14	1036302.94	754942.12	31°42'19.824"N	103°25'56.913"W	0.07	
7400.00	0.860	213.030	7399.41	9.29	-4.31	18.39	1036302.18	754940.89	31°42'19.811"N	103°25'56.921"W	0.08	
7500.00	0.820	216.040	7499.40	10.21	-5.52	17.55	1036301.35	754939.68	31°42'19.799"N	103°25'56.930"W	0.06	
7600.00	0.770	219.060	7599.39	11.03	-6.62	16.71	1036300.51	754938.58	31°42'19.788"N	103°25'56.940"W	0.07	
7700.00	0.840	218.890	7699.38	11.84	-7.71	15.83	1036299.63	754937.49	31°42'19.777"N	103°25'56.950"W	0.07	
7800.00	0.900	218.720	7799.37	12.70	-8.89	14.88	1036298.67	754936.31	31°42'19.765"N	103°25'56.960"W	0.06	
7900.00	1.140	215.930	7899.35	13.77	-10.31	13.80	1036297.60	754934.89	31°42'19.751"N	103°25'56.972"W	0.25	
8000.00	1.380	213.130	7999.33	15.16	-12.13	12.56	1036296.36	754933.08	31°42'19.733"N	103°25'56.986"W	0.25	
8100.00	1.220	215.220	8099.30	16.60	-14.00	11.29	1036295.09	754931.20	31°42'19.714"N	103°25'57.000"W	0.17	
8200.00	1.060	217.300	8199.28	17.82	-15.61	10.11	1036293.91	754929.59	31°42'19.697"N	103°25'57.013"W	0.17	
8300.00	0.890	226.050	8299.27	18.73	-16.88	8.99	1036292.79	754928.32	31°42'19.684"N	103°25'57.026"W	0.23	
8400.00	0.710	234.790	8399.26	19.29	-17.78	7.93	1036291.73	754927.42	31°42'19.675"N	103°25'57.038"W	0.22	
8500.00	0.620	243.820	8499.25	19.58	-18.38	6.94	1036290.73	754926.83	31°42'19.669"N	103°25'57.049"W	0.14	
8600.00	0.540	252.850	8599.25	19.68	-18.75	6.00	1036289.80	754926.45	31°42'19.665"N	103°25'57.060"W	0.12	
8700.00	0.600	275.800	8699.24	19.49	-18.84	5.03	1036288.83	754926.36	31°42'19.664"N	103°25'57.071"W	0.23	
8800.00	0.660	298.760	8799.24	18.89	-18.51	4.00	1036287.80	754926.69	31°42'19.667"N	103°25'57.083"W	0.26	
8900.00	0.540	269.650	8899.23	18.35	-18.24	3.03	1036286.83	754926.97	31°42'19.669"N	103°25'57.094"W	0.32	

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Operator	Energen Resources	Slot	No. 2 SHL
Area	Loving County, TX	Well	No. 2
Field	(University) Sec 8, Blk 19, ULS	Wellbore	No. 2 AWB
Facility	University 8-19 No.2		

## WELLPATH DATA (184 stations)

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	DLS [°/100ft]	Comments
9000.00	0.430	240.550	8999.23	18.31	-18.42	2.23	1036286.03	754926.78	31°42'19.667"N	103°25'57.104"W	0.27	
9100.00	1.100	242.050	9099.22	18.59	-19.06	1.05	1036284.85	754926.14	31°42'19.661"N	103°25'57.117"W	0.67	
9200.00	1.780	243.550	9199.19	19.06	-20.20	-1.18	1036282.62	754925.00	31°42'19.649"N	103°25'57.142"W	0.68	
9300.00	1.810	247.350	9299.14	19.51	-21.50	-4.03	1036279.77	754923.70	31°42'19.635"N	103°25'57.175"W	0.12	
9400.00	1.850	251.150	9399.09	19.76	-22.63	-7.02	1036276.78	754922.57	31°42'19.623"N	103°25'57.209"W	0.13	
9500.00	1.090	229.450	9499.05	20.22	-23.77	-9.27	1036274.53	754921.43	31°42'19.611"N	103°25'57.235"W	0.93	
9600.00	0.320	193.740	9599.04	20.85	-24.66	-10.06	1036273.74	754920.54	31°42'19.602"N	103°25'57.244"W	0.85	
9700.00	0.540	207.550	9699.04	21.43	-25.35	-10.34	1036273.46	754919.85	31°42'19.595"N	103°25'57.247"W	0.24	
9800.00	0.750	221.350	9799.04	22.12	-26.26	-10.99	1036272.81	754918.95	31°42'19.586"N	103°25'57.254"W	0.26	
9900.00	0.410	219.070	9899.03	22.68	-27.03	-11.65	1036272.15	754918.18	31°42'19.578"N	103°25'57.261"W	0.34	
10000.00	0.070	216.790	9999.03	22.92	-27.35	-11.91	1036271.89	754917.85	31°42'19.575"N	103°25'57.264"W	0.34	
10100.00	0.510	195.940	10099.03	23.33	-27.83	-12.07	1036271.73	754917.37	31°42'19.570"N	103°25'57.266"W	0.45	
10200.00	0.940	175.090	10199.02	24.51	-29.07	-12.12	1036271.68	754916.13	31°42'19.558"N	103°25'57.266"W	0.50	
10300.00	0.750	177.190	10299.01	25.95	-30.54	-12.02	1036271.78	754914.66	31°42'19.544"N	103°25'57.264"W	0.19	
10400.00	0.570	179.290	10399.00	27.07	-31.70	-11.98	1036271.82	754913.51	31°42'19.532"N	103°25'57.264"W	0.18	
10500.00	0.650	263.970	10499.00	27.45	-32.25	-12.54	1036271.26	754912.95	31°42'19.526"N	103°25'57.270"W	0.82	
10600.00	0.730	348.650	10598.99	26.71	-31.69	-13.23	1036270.57	754913.51	31°42'19.532"N	103°25'57.278"W	0.93	
10700.00	0.880	326.520	10698.98	25.34	-30.42	-13.78	1036270.02	754914.78	31°42'19.544"N	103°25'57.285"W	0.34	
10800.00	1.040	304.390	10798.97	23.91	-29.27	-14.95	1036268.85	754915.93	31°42'19.555"N	103°25'57.299"W	0.40	
10830.00	0.990	304.260	10828.96	23.50	-28.97	-15.39	1036268.41	754916.23	31°42'19.558"N	103°25'57.304"W	0.17	
10858.00	0.500	216.600	10856.96	23.38	-28.93	-15.66	1036268.14	754916.27	31°42'19.558"N	103°25'57.307"W	3.90	
10889.00	2.600	159.900	10887.95	24.17	-29.70	-15.50	1036268.30	754915.50	31°42'19.551"N	103°25'57.305"W	7.62	
10921.00	6.000	156.500	10919.86	26.55	-31.92	-14.59	1036269.22	754913.28	31°42'19.529"N	103°25'57.294"W	10.65	
10953.00	8.900	153.400	10951.58	30.65	-35.66	-12.81	1036270.99	754909.54	31°42'19.493"N	103°25'57.272"W	9.15	
10984.00	11.700	151.700	10982.08	36.08	-40.58	-10.24	1036273.56	754904.62	31°42'19.445"N	103°25'57.241"W	9.08	
11016.00	14.100	150.300	11013.27	43.05	-46.82	-6.78	1036277.03	754898.38	31°42'19.384"N	103°25'57.199"W	7.56	
11048.00	17.300	151.300	11044.07	51.49	-54.38	-2.56	1036281.24	754890.82	31°42'19.310"N	103°25'57.147"W	10.04	
11080.00	21.000	152.200	11074.30	61.76	-63.63	2.40	1036286.20	754881.57	31°42'19.220"N	103°25'57.087"W	11.60	
11111.00	24.700	154.200	11102.86	73.59	-74.38	7.81	1036291.61	754870.82	31°42'19.115"N	103°25'57.021"W	12.19	
11143.00	28.800	157.100	11131.43	87.85	-87.51	13.73	1036297.53	754857.70	31°42'18.987"N	103°25'56.948"W	13.44	

## REFERENCE WELLPATH IDENTIFICATION

Operator	Energen Resources	Slot	No. 2 SHL
Area	Loving County, TX	Well	No. 2
Field	(University) Sec 8, Blk 19, ULS	Wellbore	No. 2 AWB
Facility	University 8-19 No.2		

## WELLPATH DATA (184 stations)

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	DLS [°/100ft]	Comments
11175.00	32.800	158.100	11158.91	104.14	-102.65	19.96	1036303.76	754842.55	31°42'18.839"N	103°25'56.871"W	12.60	
11206.00	36.200	159.600	11184.46	121.63	-119.03	26.29	1036310.09	754826.17	31°42'18.679"N	103°25'56.793"W	11.30	
11238.00	40.200	160.800	11209.60	141.38	-137.65	32.98	1036316.78	754807.56	31°42'18.496"N	103°25'56.709"W	12.71	
11270.00	45.000	160.800	11233.15	163.00	-158.10	40.10	1036323.90	754787.11	31°42'18.296"N	103°25'56.620"W	15.00	
11302.00	50.100	161.200	11254.74	186.58	-180.42	47.78	1036331.58	754764.79	31°42'18.077"N	103°25'56.524"W	15.96	
11332.00	56.300	161.500	11272.70	210.57	-203.17	55.46	1036339.26	754742.04	31°42'17.854"N	103°25'56.428"W	20.68	
11339.00	57.000	162.400	11276.55	216.41	-208.73	57.27	1036341.07	754736.48	31°42'17.800"N	103°25'56.405"W	14.67	
11371.00	63.300	162.400	11292.47	244.14	-235.17	65.66	1036349.45	754710.04	31°42'17.541"N	103°25'56.300"W	19.69	
11403.00	68.600	161.800	11305.50	273.34	-262.96	74.64	1036358.44	754682.25	31°42'17.268"N	103°25'56.187"W	16.65	
11434.00	72.200	161.900	11315.90	302.53	-290.71	83.73	1036367.53	754654.50	31°42'16.996"N	103°25'56.073"W	11.62	
11471.00	73.300	161.800	11326.87	337.84	-324.29	94.74	1036378.54	754620.93	31°42'16.667"N	103°25'55.934"W	2.98	
11503.00	75.500	161.800	11335.48	368.65	-353.57	104.37	1036388.16	754591.65	31°42'16.380"N	103°25'55.814"W	6.87	
11535.00	78.000	162.300	11342.81	399.78	-383.20	113.96	1036397.76	754562.02	31°42'16.090"N	103°25'55.693"W	7.96	
11567.00	80.000	162.600	11348.92	431.18	-413.14	123.44	1036407.23	754532.07	31°42'15.796"N	103°25'55.574"W	6.32	
11598.00	82.100	163.100	11353.74	461.80	-442.40	132.47	1036416.26	754502.82	31°42'15.509"N	103°25'55.460"W	6.96	
11630.00	83.900	163.600	11357.64	493.56	-472.83	141.56	1036425.36	754472.39	31°42'15.211"N	103°25'55.345"W	5.83	
11662.00	85.900	163.900	11360.48	525.43	-503.43	150.48	1036434.28	754441.79	31°42'14.910"N	103°25'55.232"W	6.32	
11693.00	87.400	164.600	11362.30	556.37	-533.21	158.88	1036442.68	754412.01	31°42'14.618"N	103°25'55.125"W	5.34	
11725.00	88.900	165.100	11363.33	588.35	-564.09	167.24	1036451.03	754381.14	31°42'14.315"N	103°25'55.018"W	4.94	
11757.00	90.000	165.700	11363.64	620.33	-595.05	175.31	1036459.10	754350.18	31°42'14.011"N	103°25'54.915"W	3.92	
11789.00	90.100	166.100	11363.61	652.31	-626.09	183.10	1036466.89	754319.14	31°42'13.706"N	103°25'54.815"W	1.29	
11851.00	90.100	165.900	11363.50	714.26	-686.24	198.10	1036481.89	754258.99	31°42'13.115"N	103°25'54.622"W	0.32	
11947.00	90.100	165.400	11363.33	810.21	-779.25	221.89	1036505.69	754165.99	31°42'12.201"N	103°25'54.317"W	0.52	
12041.00	90.100	165.200	11363.17	904.17	-870.17	245.75	1036529.54	754075.07	31°42'11.309"N	103°25'54.011"W	0.21	
12135.00	90.000	165.200	11363.09	998.14	-961.05	269.76	1036553.55	753984.19	31°42'10.416"N	103°25'53.704"W	0.11	
12231.00	90.100	165.100	11363.00	1094.11	-1053.85	294.36	1036578.15	753891.40	31°42'09.505"N	103°25'53.390"W	0.15	
12325.00	89.900	165.000	11363.00	1188.09	-1144.66	318.61	1036602.40	753800.59	31°42'08.613"N	103°25'53.080"W	0.24	
12421.00	89.900	164.100	11363.17	1284.08	-1237.19	344.19	1036627.97	753708.06	31°42'07.705"N	103°25'52.754"W	0.94	
12516.00	89.900	163.700	11363.34	1379.07	-1328.47	370.53	1036654.32	753616.79	31°42'06.809"N	103°25'52.420"W	0.42	
12610.00	90.100	163.700	11363.34	1473.07	-1418.69	396.91	1036680.70	753526.57	31°42'05.924"N	103°25'52.085"W	0.21	

## REFERENCE WELLPATH IDENTIFICATION

Operator	Energen Resources	Slot	No. 2 SHL
Area	Loving County, TX	Well	No. 2
Field	(University) Sec 8, Blk 19, ULS	Wellbore	No. 2 AWP
Facility	University 8-19 No.2		

## WELLPATH DATA (184 stations)

MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	DLS [°/100ft]	Comments
12705.00	89.700	163.700	11363.50	1568.07	-1509.87	423.58	1036707.36	753435.40	31°42'05.029"N	103°25'51.748"W	0.42	
12800.00	90.500	163.800	11363.34	1663.07	-1601.07	450.16	1036733.94	753344.20	31°42'04.135"N	103°25'51.411"W	0.85	
12894.00	90.000	164.000	11362.93	1757.07	-1691.39	476.23	1036760.01	753253.89	31°42'03.248"N	103°25'51.080"W	0.57	
12989.00	90.000	163.900	11362.93	1852.07	-1782.68	502.49	1036786.27	753162.60	31°42'02.352"N	103°25'50.747"W	0.11	
13179.00	89.800	161.800	11363.26	2042.04	-1964.22	558.52	1036842.29	752981.06	31°42'00.572"N	103°25'50.040"W	1.11	
13273.00	90.000	162.000	11363.42	2135.99	-2053.57	587.72	1036871.49	752891.72	31°41'59.696"N	103°25'49.673"W	0.30	
13368.00	90.000	162.500	11363.42	2230.96	-2144.05	616.68	1036900.45	752801.25	31°41'58.809"N	103°25'49.309"W	0.53	
13462.00	90.000	163.700	11363.42	2324.95	-2233.99	644.01	1036927.78	752711.31	31°41'57.927"N	103°25'48.964"W	1.28	
13556.00	90.000	164.300	11363.42	2418.95	-2324.35	669.92	1036953.69	752620.96	31°41'57.040"N	103°25'48.635"W	0.64	
13650.00	90.300	164.100	11363.18	2512.95	-2414.80	695.51	1036979.28	752530.51	31°41'56.152"N	103°25'48.310"W	0.38	
13745.00	89.900	163.600	11363.01	2607.94	-2506.05	721.94	1037005.70	752439.27	31°41'55.257"N	103°25'47.975"W	0.67	
13839.00	89.800	163.000	11363.26	2701.94	-2596.08	748.95	1037032.71	752349.24	31°41'54.374"N	103°25'47.633"W	0.65	
13934.00	89.800	163.200	11363.59	2796.93	-2686.98	776.56	1037060.33	752258.34	31°41'53.482"N	103°25'47.284"W	0.21	
14030.00	89.900	162.600	11363.84	2892.92	-2778.73	804.79	1037088.56	752166.59	31°41'52.582"N	103°25'46.928"W	0.63	
14125.00	89.800	161.900	11364.09	2987.89	-2869.21	833.75	1037117.52	752076.12	31°41'51.695"N	103°25'46.564"W	0.74	
14220.00	89.800	162.400	11364.42	3082.85	-2959.64	862.87	1037146.63	751985.70	31°41'50.809"N	103°25'46.198"W	0.53	
14315.00	89.900	163.700	11364.67	3177.85	-3050.51	890.57	1037174.33	751894.83	31°41'49.917"N	103°25'45.848"W	1.37	
14410.00	90.000	163.500	11364.75	3272.84	-3141.64	917.39	1037201.15	751803.70	31°41'49.023"N	103°25'45.508"W	0.24	
14504.00	90.000	163.200	11364.75	3366.84	-3231.70	944.32	1037228.08	751713.65	31°41'48.140"N	103°25'45.168"W	0.32	
14599.00	90.000	163.500	11364.75	3461.84	-3322.72	971.54	1037255.30	751622.63	31°41'47.247"N	103°25'44.824"W	0.32	
14695.00	90.000	164.500	11364.75	3557.84	-3415.00	998.01	1037281.76	751530.36	31°41'46.341"N	103°25'44.488"W	1.04	
14790.00	90.000	165.100	11364.75	3652.82	-3506.67	1022.91	1037306.67	751438.69	31°41'45.441"N	103°25'44.170"W	0.63	
14883.00	90.000	165.400	11364.75	3745.79	-3596.61	1046.59	1037330.34	751348.75	31°41'44.558"N	103°25'43.867"W	0.32	
14979.00	90.000	163.900	11364.75	3841.77	-3689.18	1072.00	1037355.75	751256.19	31°41'43.649"N	103°25'43.543"W	1.56	
15073.00	90.200	162.800	11364.59	3935.77	-3779.24	1098.94	1037382.69	751166.13	31°41'42.766"N	103°25'43.203"W	1.19	
15168.00	90.300	163.100	11364.17	4030.76	-3870.06	1126.79	1037410.54	751075.31	31°41'41.875"N	103°25'42.851"W	0.33	
15263.00	90.300	163.500	11363.67	4125.76	-3961.05	1154.09	1037437.84	750984.32	31°41'40.982"N	103°25'42.506"W	0.42	
15358.00	89.900	163.700	11363.51	4220.75	-4052.19	1180.91	1037464.66	750893.19	31°41'40.088"N	103°25'42.166"W	0.47	
15453.00	89.900	163.500	11363.67	4315.75	-4143.32	1207.73	1037491.48	750802.06	31°41'39.194"N	103°25'41.827"W	0.21	
15547.00	89.900	163.600	11363.84	4409.75	-4233.47	1234.35	1037518.10	750711.92	31°41'38.310"N	103°25'41.490"W	0.11	

## REFERENCE WELLPATH IDENTIFICATION

Operator	<b>Energen Resources</b>	Slot	<b>No. 2 SHL</b>
Area	<b>Loving County, TX</b>	Well	<b>No. 2</b>
Field	<b>(University) Sec 8, Blk 19, ULS</b>	Wellbore	<b>No. 2 AWB</b>
Facility	<b>University 8-19 No.2</b>		

## WELLPATH DATA (184 stations)

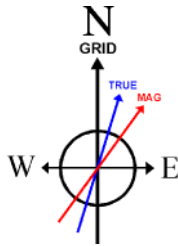
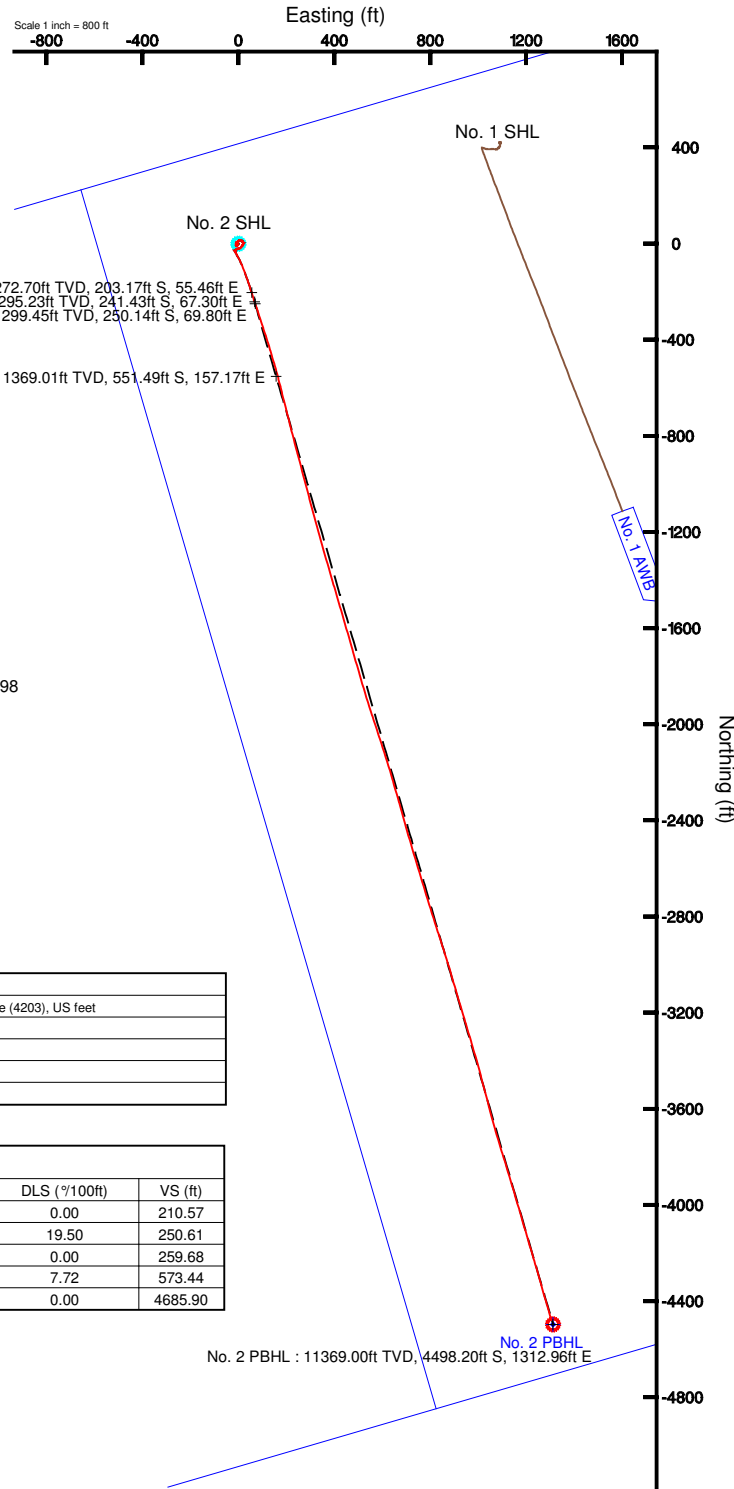
MD [ft]	Inclination [°]	Azimuth [°]	TVD [ft]	Vert Sect [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	DLS [°/100ft]	Comments
15643.00	90.000	163.900	11363.92	4505.75	-4325.64	1261.22	1037544.96	750619.76	31°41'37.405"N	103°25'41.149"W	0.33	
15737.00	90.000	164.200	11363.92	4599.75	-4416.02	1287.05	1037570.79	750529.38	31°41'36.518"N	103°25'40.821"W	0.32	
15764.00	89.900	164.100	11363.95	4626.75	-4441.99	1294.42	1037578.16	750503.41	31°41'36.263"N	103°25'40.728"W	0.52	
15800.00	89.900	164.100	11364.01	4662.75	-4476.62	1304.28	1037588.03	750468.79	31°41'35.923"N	103°25'40.602"W	0.00	Projection to bit

## TARGETS

Name	MD [ft]	TVD [ft]	North [ft]	East [ft]	Grid East [US ft]	Grid North [US ft]	Latitude	Longitude	Shape
<b>No. 2 PBHL</b>		11369.00	-4498.20	1312.96	<b>1037596.70</b>	<b>750447.20</b>	31°41'35.712"N	103°25'40.495"W	point

## WELLPATH COMPOSITION - Ref Wellbore: No. 2 AWB Ref Wellpath: No. 2 AWP

Start MD [ft]	End MD [ft]	Positional Uncertainty Model	Log Name/Comment	Wellbore
0.00	10830.00	Generic gyro - northseeking (Standard)	VES / Gyros <100-10830>	No. 2 AWB
10830.00	11332.00	ISCWSA MWD, Rev. 2 (Standard)	Phoenix / MWD <10858-11332>	No. 2 AWB
11332.00	15764.00	NaviTrak (Standard)	BHI / Navitrak MWD <11339-15764>	No. 2 AWB
15764.00	15800.00	Blind Drilling (std)	Projection to bit	No. 2 AWB



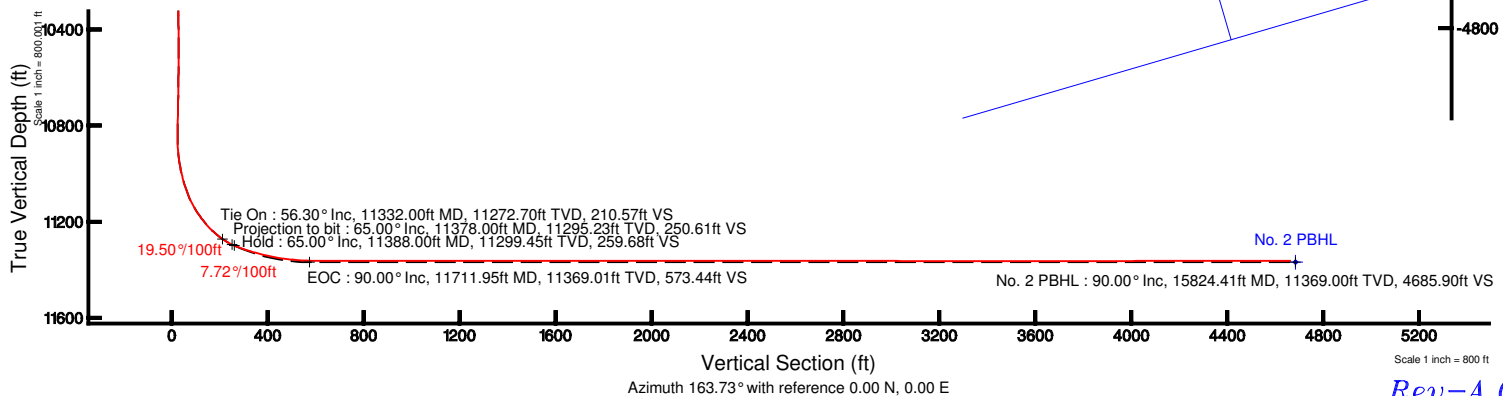
BGGM (1945.0 to 2014.0) Dip: 59.64° Field: 48134.2 nT  
 Magnetic North is 7.38 degrees East of True North (at 2/15/2013)  
 Grid North is 1.60 degrees West of True North

To correct azimuth from True to Grid add 1.60 degrees  
 To correct azimuth from Magnetic to Grid add 8.98 degrees

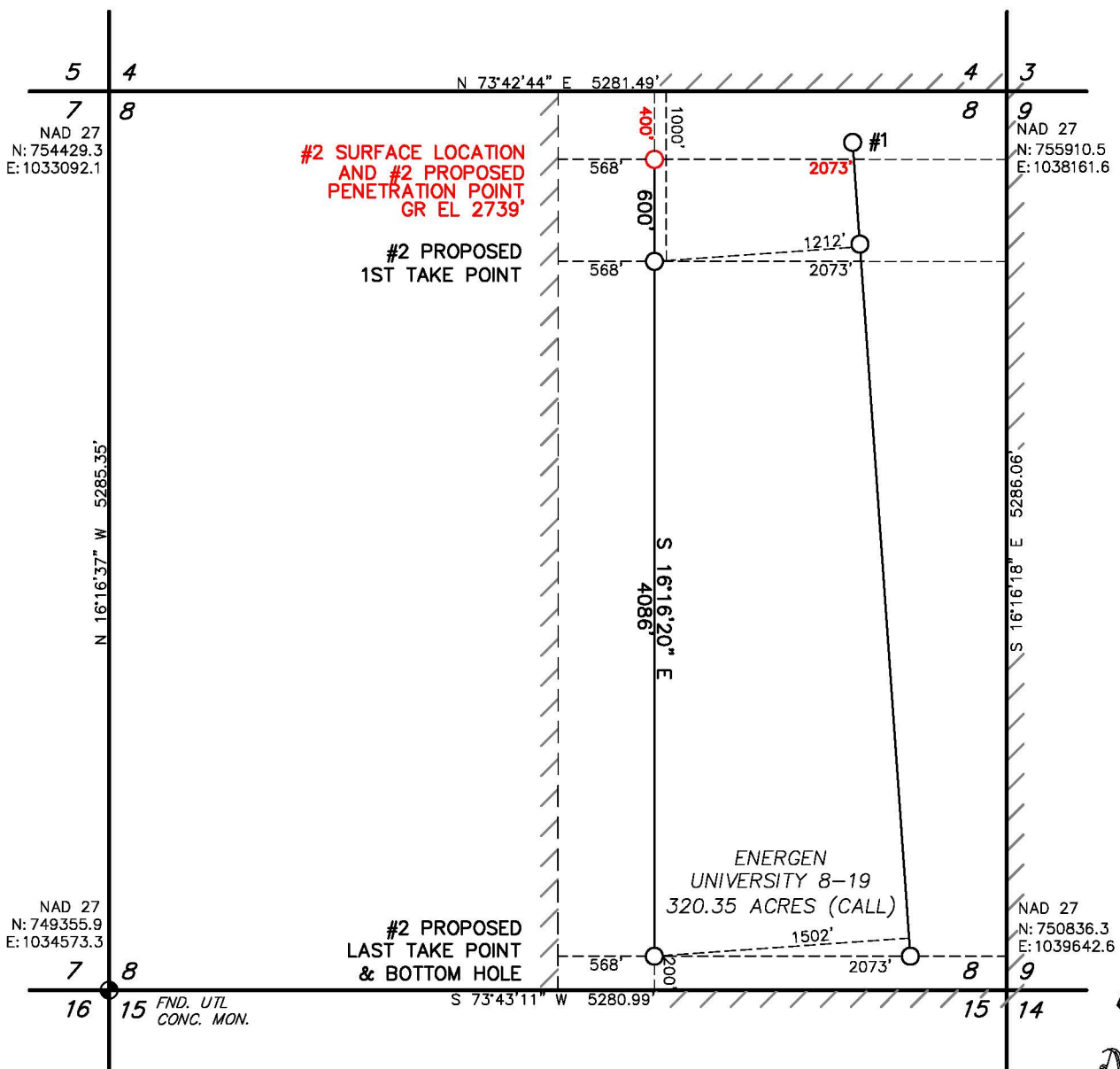
For example: if the Magnetic North Azimuth = 90 degs, then the Grid North Azimuth = 90 + 8.98 = 98.98

Plot reference wellpath is Rev-A.0	
True vertical depths are referenced to Rig on No. 2 SHL (KB)	Grid System: NAD27 / Lambert Texas SP, Central Zone (4203), US feet
Measured depths are referenced to Rig on No. 2 SHL (KB)	North Reference: Grid north
Rig on No. 2 SHL (KB) to Mean Sea Level: 2769 feet	Scale: True distance
Mean Sea Level to Mud line (At Slot: No. 2 SHL): -2739 feet	Depths are in feet
Coordinates are in feet referenced to Slot	Created by: harkol on 3/2/2013

Well Profile Data							
Design Comment	MD (ft)	Inc (°)	Az (°)	TVD (ft)	Local N (ft)	Local E (ft)	VS (ft)
Tie On	11332.00	56.300	161.500	11272.70	-203.17	55.46	210.57
Projection to bit	11378.00	65.000	164.000	11295.23	-241.43	67.30	250.61
Hold	11388.00	65.000	164.000	11299.45	-250.14	69.80	259.68
EOC	11711.95	90.000	163.677	11369.01	-551.49	157.17	573.44
No. 2 PBHL	15824.41	90.000	163.677	11369.00	-4498.20	1312.96	4685.90



A-UB  
**SECTION 8, BLOCK 19, UNIVERSITY LAND SURVEY**



NAD 83, TEXAS CENTRAL ZONE	NAD 27, TEXAS CENTRAL ZONE
S/L: N=10597521.7', E=1332748.0' LAT=31.7056429 N, LONG=103.4329906 W	S/L: N=754945.2', E=1036283.8' LAT=31.7055137 N, LONG=103.4325377 W
1ST/P: N=10596945.7', E=1332916.1' LAT=31.7040730 N, LONG=103.4323986 W	1ST/P: N=754369.2', E=1036451.9' LAT=31.7039437 N, LONG=103.4319458 W
L/P: N=10593023.6', E=1334061.0' LAT=31.6933829 N, LONG=103.4283680 W	L/P: N=750447.2', E=1037596.7' LAT=31.6932534 N, LONG=103.4279153 W

**APPROXIMATELY 19.8 MILES E OF MENTONE, TEXAS**

NOTES:  
 1. COORDINATES AND BEARINGS SHOWN HEREON ARE NAD 83, LAMBERT GRID COORDINATES AND CONFORM TO THE TEXAS COORDINATE SYSTEM "TEXAS CENTRAL ZONE," WITH REFERENCE TO USGS TRI-STATION "MIL" WITH A CENTRAL COMBINED SCALE FACTOR OF 0.999956916. THE POSITIONAL TOLERANCE OF THIS SURVEY EXCEEDS THE REQUIREMENTS FOR A RURAL SURVEY.  
 2. THIS SURVEY WAS PERFORMED WITHOUT THE BENEFIT OF A TITLE REPORT AND REVIEW OF THE ABSTRACT OF TITLE. THERE MAY BE EASEMENTS AND/OR COVENANTS AFFECTING THIS PROPERTY NOT SHOWN HEREON. LOCATION OF IMPROVEMENTS AND/OR EASEMENTS WERE BEYOND COMMISSIONED SCOPE OF THIS PROJECT AND HAVE BEEN SPECIFICALLY OMITTED. VESTING DOCUMENTS NOT FURNISHED FOR THIS SURVEY.  
 3. SEE DOCUMENTS AND ELECTRONIC DATA FILED IN THE OFFICE OF WPG INC FOR COMPLETE RECONSTRUCTION OF THESE SECTIONS OR BLOCKS.

I, THE UNDERSIGNED, DO HEREBY CERTIFY THAT THE SURVEY INFORMATION FOUND ON THIS PLAT WAS DERIVED FROM ACTUAL FIELD NOTES OF ON-THE-GROUND SURVEYS MADE BY ME OR UNDER MY SUPERVISION AND IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF. NO WARRANTY IS MADE OR INTENDED FOR THE LOCATION OF ANY OR ALL EASEMENTS THAT MAY EXIST WITHIN THE BOUNDS OF THIS SURVEY. THE INFORMATION PRESENTED HEREON IS FOR THE PRIVATE USE OF THE PARTY NAMED IN THE "REFERENCE PORTION" OF THE TITLE BLOCK AND DOES NOT CONSTITUTE A COMPLETE BOUNDARY SURVEY AS DEFINED BY THE "PROFESSIONAL LAND SURVEYING PRACTICES ACT."



- GAS WELL
- WATER INJECTION WELL
- OIL WELL
- LOCATED WELL
- DRY HOLE
- WATER WELL
- SHUT IN WELL

*[Signature]*  
 W.D. Watson, Jr. TEXAS R.P.L.S. No. 1989 DATE 9/11/12  
 FILE: M:CHAPARRALLOVINGCOUNTY\DWG\CHAPARRALW-482-07.dwg



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 MIDLAND, TEXAS 79702  
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 wd.watson@wpg-us.com

CONSULTING ENGINEERS, LAND SURVEYORS & PLANNERS

PERMIT PLAT  
**ENERGEN RESOURCES**  
**UNIVERSITY 8-19 #2**  
 S/L & PROPOSED P/P: 400' FNWL & 2073' FNEL  
 PROPOSED 1ST T/P: 1000' FNWL & 2073' FNEL  
 PROPOSED LAST T/P & B/H: 200' FSEL & 2073' FNEL  
**SECTION 8, BLOCK 19, UNIVERSITY LAND SURVEY**  
**LOVING COUNTY, TEXAS**

DATE: SEPTEMBER 7, 2012 DATE SURVEYED: 8/29/12  
 JOB NO.: 12-1370-00 FIELD BOOK 706/04 DRAFT NGH REV. 0