



September 27, 2016

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

Attention: Regulatory Dept.

Re: Shell Western Exploration and Production Co.
University 20 A 2003H
Loving County, TX
API #42301329370000
Job No. 60214

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	
Seth Theriot	2003H	174	19,944	07/29/16	09/15/16	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,

Claudia Carreon

Claudia Carreon
Operations Administrator



SWEPI

**Loving County, Texas (NAD27)
University 20
A 2003H**

OH / Job 60214

Survey: Phoenix MWD Surveys

Standard Survey Report

16 September, 2016





Phoenix Technology Services LP

Survey Report



Company:	SWEPI	Local Co-ordinate Reference:	Well A 2003H
Project:	Loving County, Texas (NAD27)	TVD Reference:	RKB @ 2807.50usft (Precision 565)
Site:	University 20	MD Reference:	RKB @ 2807.50usft (Precision 565)
Well:	A 2003H	North Reference:	Grid
Wellbore:	OH / Job 60214	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Precision 565)	Database:	Compass 5000 GCR

Project	Loving County, Texas (NAD27), Loving, Texas		
Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	Texas Central 4203		

Site	University 20		
Site Position:		Northing:	747,307.51 usft
From:	Map	Easting:	1,066,466.80 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	31° 41' 12.47899 N
		Longitude:	103° 20' 5.48771 W
		Grid Convergence:	-1.55 °

Well	A 2003H		
Well Position	+N-S	0.00 usft	Northing:
	+E-W	0.00 usft	Easting:
Position Uncertainty	0.00 usft	Wellhead Elevation:	0.00 usft
		Latitude:	31° 41' 12.47899 N
		Longitude:	103° 20' 5.48771 W
		Ground Level:	2,779.00 usft

Wellbore	OH / Job 60214				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	7/26/2016	7.13	59.60	47,733

Design	Surveys (Precision 565)				
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	343.45	

Survey Program	Date	9/16/2016			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
174.00	20,000.00	Phoenix MWD Surveys (OH / Job 60214)	PHX+MWD+HDGM+AX	PHX+OWSG MWD + HDGM + Axial Correction	

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
174.00	0.13	341.75	174.00	0.19	-0.06	0.20	0.07	0.07	0.00
First Phoenix MWD Survey									
294.00	3.19	281.94	293.94	1.01	-3.37	1.93	2.61	2.55	-49.84
414.00	6.66	277.17	413.48	2.57	-13.55	6.32	2.91	2.89	-3.98
539.00	9.63	258.73	537.22	1.43	-31.00	10.20	3.14	2.38	-14.75
602.00	10.02	257.42	599.30	-0.80	-41.52	11.06	0.71	0.62	-2.08
696.00	9.94	257.97	691.88	-4.27	-57.43	12.27	0.13	-0.09	0.59
790.00	10.08	257.29	784.44	-7.77	-73.39	13.46	0.19	0.15	-0.72
978.00	9.79	256.33	969.62	-15.17	-104.97	15.36	0.18	-0.15	-0.51
1,162.00	9.41	256.72	1,151.05	-22.32	-134.81	17.01	0.21	-0.21	0.21



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Well:	A 2003H	North Reference:	Grid
Wellbore:	OH / Job 60214	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Precision 565)	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)
1,342.00	10.17	255.96	1,328.43	-29.55	-164.55	18.54	0.43	0.42	-0.42
1,431.00	10.39	256.13	1,416.00	-33.38	-179.96	19.26	0.25	0.25	0.19
1,611.00	10.55	257.49	1,593.00	-40.84	-211.81	21.18	0.16	0.09	0.76
1,790.00	10.57	257.35	1,768.97	-47.99	-243.83	23.45	0.02	0.01	-0.08
1,970.00	10.86	256.11	1,945.83	-55.67	-276.39	25.36	0.21	0.16	-0.69
2,149.00	11.05	257.01	2,121.57	-63.58	-309.48	27.21	0.14	0.11	0.50
2,329.00	11.26	257.53	2,298.17	-71.25	-343.45	29.53	0.13	0.12	0.29
2,509.00	10.88	258.53	2,474.82	-78.42	-377.25	32.29	0.24	-0.21	0.56
2,688.00	11.06	257.89	2,650.55	-85.38	-410.60	35.11	0.12	0.10	-0.36
2,868.00	10.80	258.16	2,827.28	-92.47	-443.98	37.83	0.15	-0.14	0.15
3,047.00	9.58	243.76	3,003.48	-102.50	-473.76	36.70	1.57	-0.68	-8.04
3,137.00	9.11	242.15	3,092.29	-109.13	-486.78	34.05	0.60	-0.52	-1.79
3,227.00	8.42	234.85	3,181.24	-116.26	-498.47	30.55	1.45	-0.77	-8.11
3,406.00	8.03	233.67	3,358.40	-131.21	-519.26	22.14	0.24	-0.22	-0.66
3,586.00	7.98	232.03	3,536.65	-146.34	-539.24	13.32	0.13	-0.03	-0.91
3,766.00	7.30	229.28	3,715.05	-161.49	-557.75	4.08	0.43	-0.38	-1.53
3,945.00	6.72	226.44	3,892.71	-176.13	-573.96	-5.34	0.38	-0.32	-1.59
4,124.00	5.92	221.65	4,070.62	-190.24	-587.69	-14.96	0.53	-0.45	-2.68
4,304.00	5.51	221.06	4,249.73	-203.70	-599.53	-24.48	0.23	-0.23	-0.33
4,393.00	5.35	222.46	4,338.33	-209.98	-605.14	-28.90	0.23	-0.18	1.57
4,483.00	5.08	223.81	4,427.95	-215.95	-610.73	-33.04	0.33	-0.30	1.50
4,573.00	4.75	223.41	4,517.62	-221.53	-616.05	-36.87	0.37	-0.37	-0.44
4,663.00	4.38	222.47	4,607.34	-226.77	-620.93	-40.51	0.42	-0.41	-1.04
4,753.00	4.22	220.47	4,697.08	-231.83	-625.40	-44.08	0.24	-0.18	-2.22
4,932.00	3.75	215.20	4,875.65	-241.62	-633.05	-51.29	0.33	-0.26	-2.94
5,021.00	3.57	214.16	4,964.47	-246.29	-636.28	-54.84	0.22	-0.20	-1.17
5,111.00	3.22	211.88	5,054.31	-250.76	-639.19	-58.29	0.42	-0.39	-2.53
5,201.00	2.84	209.19	5,144.19	-254.85	-641.61	-61.53	0.45	-0.42	-2.99
5,291.00	2.76	208.53	5,234.08	-258.70	-643.74	-64.61	0.10	-0.09	-0.73
5,380.00	2.70	205.74	5,322.98	-262.47	-645.67	-67.68	0.16	-0.07	-3.13
5,470.00	2.67	204.19	5,412.88	-266.29	-647.45	-70.83	0.09	-0.03	-1.72
5,560.00	2.72	202.40	5,502.78	-270.18	-649.12	-74.08	0.11	0.06	-1.99
5,650.00	2.83	197.16	5,592.67	-274.28	-650.59	-77.59	0.31	0.12	-5.82
5,739.00	2.69	198.82	5,681.57	-278.35	-651.91	-81.12	0.18	-0.16	1.87
5,829.00	2.61	200.55	5,771.47	-282.27	-653.31	-84.48	0.13	-0.09	1.92
5,919.00	2.58	199.64	5,861.38	-286.10	-654.71	-87.75	0.06	-0.03	-1.01
6,008.00	2.53	197.23	5,950.29	-289.86	-655.97	-91.00	0.13	-0.06	-2.71
6,098.00	2.53	198.45	6,040.21	-293.64	-657.19	-94.28	0.06	0.00	1.36
6,188.00	2.56	196.58	6,130.12	-297.45	-658.39	-97.59	0.10	0.03	-2.08
6,277.00	2.56	194.73	6,219.03	-301.28	-659.46	-100.95	0.09	0.00	-2.08
6,367.00	2.35	194.47	6,308.94	-305.01	-660.43	-104.25	0.23	-0.23	-0.29
6,457.00	2.29	187.85	6,398.87	-308.58	-661.14	-107.47	0.30	-0.07	-7.36
6,547.00	2.42	182.57	6,488.80	-312.26	-661.47	-110.90	0.28	0.14	-5.87



Phoenix Technology Services LP

Survey Report



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Site:	University 20	MD Reference:	RKB @ 2807.50usft (Precision 565)
Well:	A 2003H	North Reference:	Grid
Wellbore:	OH / Job 60214	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Precision 565)	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)
6,636.00	2.22	186.05	6,577.72	-315.85	-661.74	-114.27	0.27	-0.22	3.91
6,726.00	2.46	186.20	6,667.65	-319.50	-662.13	-117.66	0.27	0.27	0.17
6,816.00	2.24	179.62	6,757.57	-323.18	-662.33	-121.13	0.39	-0.24	-7.31
6,906.00	2.26	186.25	6,847.50	-326.70	-662.51	-124.45	0.29	0.02	7.37
6,995.00	2.12	186.79	6,936.44	-330.08	-662.89	-127.58	0.16	-0.16	0.61
7,085.00	2.04	192.93	7,026.38	-333.30	-663.45	-130.51	0.26	-0.09	6.82
7,175.00	2.21	193.41	7,116.32	-336.55	-664.21	-133.40	0.19	0.19	0.53
7,264.00	1.98	198.81	7,205.26	-339.67	-665.10	-136.14	0.34	-0.26	6.07
7,354.00	1.90	195.46	7,295.21	-342.58	-666.00	-138.68	0.15	-0.09	-3.72
7,444.00	2.04	206.02	7,385.15	-345.46	-667.10	-141.12	0.43	0.16	11.73
7,534.00	1.99	223.91	7,475.10	-348.02	-668.89	-143.07	0.70	-0.06	19.88
7,624.00	2.07	232.72	7,565.04	-350.13	-671.27	-144.42	0.36	0.09	9.79
7,713.00	1.96	234.08	7,653.99	-352.00	-673.78	-145.49	0.13	-0.12	1.53
7,803.00	1.92	233.41	7,743.93	-353.80	-676.23	-146.52	0.05	-0.04	-0.74
7,893.00	1.66	226.61	7,833.89	-355.60	-678.39	-147.62	0.37	-0.29	-7.56
7,983.00	1.82	233.34	7,923.85	-357.35	-680.49	-148.70	0.29	0.18	7.48
8,072.00	1.74	237.07	8,012.81	-358.92	-682.75	-149.57	0.16	-0.09	4.19
8,162.00	1.60	238.13	8,102.77	-360.33	-684.97	-150.29	0.16	-0.16	1.18
8,252.00	1.50	235.49	8,192.74	-361.66	-687.01	-150.98	0.14	-0.11	-2.93
8,342.00	1.65	239.28	8,282.70	-362.99	-689.09	-151.66	0.20	0.17	4.21
8,431.00	1.56	242.13	8,371.67	-364.21	-691.26	-152.22	0.14	-0.10	3.20
8,521.00	1.79	239.01	8,461.63	-365.51	-693.55	-152.81	0.27	0.26	-3.47
8,611.00	1.68	233.91	8,551.59	-367.01	-695.82	-153.60	0.21	-0.12	-5.67
8,701.00	1.38	231.95	8,641.55	-368.45	-697.74	-154.44	0.34	-0.33	-2.18
8,791.00	1.18	221.77	8,731.53	-369.81	-699.21	-155.32	0.34	-0.22	-11.31
8,880.00	1.04	209.74	8,820.52	-371.20	-700.22	-156.36	0.30	-0.16	-13.52
8,970.00	0.88	210.65	8,910.50	-372.50	-700.98	-157.39	0.18	-0.18	1.01
9,061.00	1.22	193.53	9,001.49	-374.04	-701.56	-158.71	0.50	0.37	-18.81
9,240.00	1.53	179.50	9,180.44	-378.29	-701.99	-162.65	0.25	0.17	-7.84
9,420.00	2.13	200.47	9,360.35	-383.82	-703.14	-167.63	0.49	0.33	11.65
9,599.00	2.12	196.65	9,539.22	-390.11	-705.25	-173.06	0.08	-0.01	-2.13
9,779.00	1.70	173.52	9,719.13	-395.95	-705.90	-178.47	0.48	-0.23	-12.85
9,869.00	1.01	189.39	9,809.10	-398.06	-705.88	-180.50	0.87	-0.77	17.63
9,959.00	1.23	130.64	9,899.09	-399.48	-705.28	-182.03	1.24	0.24	-65.28
10,049.00	0.95	121.09	9,989.07	-400.49	-703.90	-183.39	0.37	-0.31	-10.61
10,138.00	0.74	115.35	10,078.06	-401.12	-702.75	-184.32	0.25	-0.24	-6.45
10,228.00	0.82	120.17	10,168.05	-401.69	-701.67	-185.18	0.11	0.09	5.36
10,318.00	0.40	142.33	10,258.05	-402.26	-700.92	-185.94	0.53	-0.47	24.62
10,407.00	0.45	114.91	10,347.04	-402.66	-700.42	-186.46	0.23	0.06	-30.81
10,497.00	0.35	116.74	10,437.04	-402.93	-699.85	-186.88	0.11	-0.11	2.03
10,587.00	2.01	194.97	10,527.02	-404.58	-700.01	-188.42	2.19	1.84	86.92
10,676.00	3.05	195.51	10,615.93	-408.37	-701.05	-191.75	1.17	1.17	0.61
10,766.00	2.98	193.17	10,705.81	-412.95	-702.22	-195.81	0.16	-0.08	-2.60



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10,856.00	2.39	198.37	10,795.71	-417.01	-703.35	-199.38	0.71	-0.66	5.78
10,945.00	2.20	192.66	10,884.64	-420.44	-704.31	-202.40	0.33	-0.21	-6.42
11,125.00	1.29	271.10	11,064.57	-423.77	-707.09	-204.80	1.29	-0.51	43.58
11,214.00	1.28	276.68	11,153.55	-423.63	-709.08	-204.10	0.14	-0.01	6.27
11,320.00	1.01	267.16	11,259.53	-423.54	-711.19	-203.41	0.31	-0.25	-8.98
11,409.00	6.84	338.98	11,348.30	-418.63	-713.87	-197.94	7.41	6.55	80.70
11,499.00	18.18	350.84	11,436.04	-399.70	-718.05	-178.61	12.85	12.60	13.18
11,589.00	23.81	347.76	11,520.03	-368.06	-724.14	-146.54	6.37	6.26	-3.42
11,679.00	32.38	348.71	11,599.35	-326.60	-732.72	-104.35	9.53	9.52	1.06
11,768.00	41.86	346.71	11,670.24	-274.20	-744.24	-50.85	10.74	10.65	-2.25
11,858.00	48.94	346.19	11,733.39	-211.95	-759.26	13.11	7.88	7.87	-0.58
11,948.00	54.73	344.46	11,788.99	-143.54	-777.22	83.80	6.61	6.43	-1.92
12,038.00	63.45	345.96	11,835.18	-68.95	-796.87	160.90	9.79	9.69	1.67
12,078.00	69.13	345.27	11,851.25	-33.49	-805.97	197.48	14.29	14.20	-1.73
12,179.00	72.69	347.38	11,884.28	59.24	-828.51	292.79	4.04	3.52	2.09
12,269.00	79.77	346.45	11,905.69	144.32	-848.30	379.98	7.93	7.87	-1.03
12,310.00	83.64	345.64	11,911.61	183.69	-858.08	420.50	9.64	9.44	-1.98
12,359.00	89.64	345.44	11,914.48	231.03	-870.29	469.36	12.25	12.24	-0.41
12,448.00	89.16	344.01	11,915.41	316.88	-893.74	558.34	1.69	-0.54	-1.61
12,538.00	88.29	342.64	11,917.41	403.07	-919.55	648.31	1.80	-0.97	-1.52
12,628.00	88.12	343.30	11,920.23	489.08	-945.90	738.26	0.76	-0.19	0.73
12,718.00	89.55	345.92	11,922.06	575.83	-969.78	828.21	3.32	1.59	2.91
12,808.00	91.82	346.17	11,920.99	663.16	-991.48	918.11	2.54	2.52	0.28
12,898.00	90.62	345.46	11,919.07	750.39	-1,013.53	1,008.01	1.55	-1.33	-0.79
12,987.00	91.54	345.61	11,917.39	836.56	-1,035.75	1,096.94	1.05	1.03	0.17
13,077.00	87.48	341.22	11,918.16	922.77	-1,061.43	1,186.89	6.64	-4.51	-4.88
13,166.00	87.57	342.32	11,922.01	1,007.22	-1,089.24	1,275.77	1.24	0.10	1.24
13,256.00	86.89	342.14	11,926.35	1,092.83	-1,116.68	1,365.64	0.78	-0.76	-0.20
13,346.00	89.94	342.84	11,928.84	1,178.61	-1,143.74	1,455.58	3.48	3.39	0.78
13,435.00	93.33	343.34	11,926.30	1,263.72	-1,169.62	1,544.53	3.85	3.81	0.56
13,524.00	93.05	342.80	11,921.35	1,348.73	-1,195.49	1,633.39	0.68	-0.31	-0.61
13,614.00	92.38	342.41	11,917.09	1,434.52	-1,222.37	1,723.28	0.86	-0.74	-0.43
13,704.00	92.49	341.94	11,913.27	1,520.12	-1,249.90	1,813.18	0.54	0.12	-0.52
13,793.00	92.13	341.19	11,909.68	1,604.48	-1,278.02	1,902.06	0.93	-0.40	-0.84
13,883.00	89.58	340.82	11,908.33	1,689.56	-1,307.30	1,991.96	2.86	-2.83	-0.41
13,973.00	89.78	341.00	11,908.84	1,774.61	-1,336.74	2,081.87	0.30	0.22	0.20
14,062.00	89.13	340.41	11,909.68	1,858.61	-1,366.15	2,170.76	0.99	-0.73	-0.66
14,152.00	89.02	339.61	11,911.14	1,943.18	-1,396.91	2,260.59	0.90	-0.12	-0.89
14,242.00	89.05	341.71	11,912.65	2,028.08	-1,426.71	2,350.46	2.33	0.03	2.33
14,332.00	89.64	345.11	11,913.68	2,114.32	-1,452.40	2,440.44	3.83	0.66	3.78
14,422.00	90.20	350.43	11,913.81	2,202.24	-1,471.46	2,530.15	5.94	0.62	5.91
14,511.00	90.90	347.05	11,912.95	2,289.51	-1,488.83	2,618.76	3.88	0.79	-3.80
14,601.00	88.32	345.14	11,913.57	2,376.86	-1,510.46	2,708.65	3.57	-2.87	-2.12
14,691.00	89.44	345.26	11,915.33	2,463.86	-1,533.44	2,798.59	1.25	1.24	0.13



Phoenix Technology Services LP

Survey Report



Company:	SWEPI	Local Co-ordinate Reference:	Well A 2003H
Project:	Loving County, Texas (NAD27)	TVD Reference:	RKB @ 2807.50usft (Precision 565)
Site:	University 20	MD Reference:	RKB @ 2807.50usft (Precision 565)
Well:	A 2003H	North Reference:	Grid
Wellbore:	OH / Job 60214	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Precision 565)	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)
14,781.00	89.69	347.75	11,916.01	2,551.36	-1,554.44	2,888.45	2.78	0.28	2.77
14,870.00	89.50	350.02	11,916.64	2,638.68	-1,571.60	2,977.04	2.56	-0.21	2.55
14,960.00	88.66	345.82	11,918.08	2,726.66	-1,590.43	3,066.73	4.76	-0.93	-4.67
15,050.00	88.80	345.00	11,920.08	2,813.73	-1,613.09	3,156.66	0.92	0.16	-0.91
15,139.00	88.88	342.78	11,921.88	2,899.22	-1,637.78	3,245.63	2.50	0.09	-2.49
15,229.00	89.81	343.28	11,922.91	2,985.29	-1,664.05	3,335.62	1.17	1.03	0.56
15,319.00	89.55	345.33	11,923.41	3,071.93	-1,688.39	3,425.61	2.30	-0.29	2.28
15,409.00	89.92	348.73	11,923.83	3,159.62	-1,708.59	3,515.42	3.80	0.41	3.78
15,498.00	88.85	340.81	11,924.78	3,245.42	-1,731.95	3,604.32	8.98	-1.20	-8.90
15,588.00	89.47	338.48	11,926.10	3,329.78	-1,763.25	3,694.10	2.68	0.69	-2.59
15,678.00	89.44	340.03	11,926.96	3,413.94	-1,795.12	3,783.85	1.72	-0.03	1.72
15,768.00	89.30	341.38	11,927.95	3,498.88	-1,824.86	3,873.74	1.51	-0.16	1.50
15,858.00	89.97	345.96	11,928.52	3,585.22	-1,850.16	3,963.71	5.14	0.74	5.09
15,947.00	89.97	345.51	11,928.57	3,671.48	-1,872.09	4,052.64	0.51	0.00	-0.51
16,039.00	89.33	339.19	11,929.13	3,759.10	-1,899.97	4,144.58	6.90	-0.70	-6.87
16,129.00	89.86	336.71	11,929.77	3,842.51	-1,933.75	4,234.15	2.82	0.59	-2.76
16,218.00	90.20	337.44	11,929.72	3,924.48	-1,968.42	4,322.60	0.90	0.38	0.82
16,308.00	89.36	335.54	11,930.07	4,007.00	-2,004.32	4,411.93	2.31	-0.93	-2.11
16,398.00	90.67	339.44	11,930.04	4,090.13	-2,038.77	4,501.43	4.57	1.46	4.33
16,488.00	88.49	339.50	11,930.70	4,174.41	-2,070.33	4,591.20	2.42	-2.42	0.07
16,577.00	88.24	339.89	11,933.24	4,257.84	-2,101.20	4,679.98	0.52	-0.28	0.44
16,667.00	86.70	339.36	11,937.22	4,342.13	-2,132.50	4,769.69	1.81	-1.71	-0.59
16,757.00	86.25	339.75	11,942.75	4,426.30	-2,163.88	4,859.31	0.66	-0.50	0.43
16,846.00	91.37	340.74	11,944.60	4,510.01	-2,193.94	4,948.12	5.86	5.75	1.11
16,936.00	87.99	338.20	11,945.10	4,594.28	-2,225.50	5,037.88	4.70	-3.76	-2.82
17,026.00	88.52	339.73	11,947.84	4,678.24	-2,257.79	5,127.56	1.80	0.59	1.70
17,116.00	86.64	337.71	11,951.64	4,762.02	-2,290.42	5,217.16	3.06	-2.09	-2.24
17,206.00	85.47	337.92	11,957.83	4,845.16	-2,324.32	5,306.52	1.32	-1.30	0.23
17,295.00	86.87	338.40	11,963.78	4,927.58	-2,357.35	5,394.94	1.66	1.57	0.54
17,385.00	89.94	340.77	11,966.28	5,011.88	-2,388.73	5,484.68	4.31	3.41	2.63
17,475.00	93.13	343.25	11,963.87	5,097.43	-2,416.51	5,574.60	4.49	3.54	2.76
17,565.00	93.27	342.94	11,958.85	5,183.41	-2,442.64	5,664.46	0.38	0.16	-0.34
17,654.00	93.41	342.80	11,953.66	5,268.31	-2,468.81	5,753.30	0.22	0.16	-0.16
17,744.00	92.18	344.24	11,949.27	5,354.51	-2,494.31	5,843.19	2.10	-1.37	1.60
17,833.00	91.76	344.49	11,946.22	5,440.17	-2,518.28	5,932.13	0.55	-0.47	0.28
17,923.00	91.43	343.88	11,943.71	5,526.73	-2,542.80	6,022.08	0.77	-0.37	-0.68
18,013.00	90.48	343.11	11,942.21	5,613.00	-2,568.36	6,112.07	1.36	-1.06	-0.86
18,102.00	88.71	341.93	11,942.84	5,697.89	-2,595.09	6,201.05	2.39	-1.99	-1.33
18,192.00	88.94	341.72	11,944.68	5,783.38	-2,623.16	6,291.00	0.35	0.26	-0.23
18,282.00	89.25	343.50	11,946.11	5,869.25	-2,650.06	6,380.97	2.01	0.34	1.98
18,371.00	89.36	344.08	11,947.19	5,954.71	-2,674.90	6,469.96	0.66	0.12	0.65
18,462.00	89.44	345.24	11,948.14	6,042.46	-2,698.97	6,560.94	1.28	0.09	1.27
18,551.00	89.83	343.85	11,948.71	6,128.24	-2,722.69	6,649.91	1.62	0.44	-1.56



Phoenix Technology Services LP

Survey Report



Company:	SWEPI	Local Co-ordinate Reference:	Well A 2003H
Project:	Loving County, Texas (NAD27)	TVD Reference:	RKB @ 2807.50usft (Precision 565)
Site:	University 20	MD Reference:	RKB @ 2807.50usft (Precision 565)
Well:	A 2003H	North Reference:	Grid
Wellbore:	OH / Job 60214	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Precision 565)	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)
18,640.00	89.08	339.14	11,949.55	6,212.61	-2,750.92	6,738.83	5.36	-0.84	-5.29
18,730.00	89.02	340.68	11,951.04	6,297.12	-2,781.83	6,828.65	1.71	-0.07	1.71
18,820.00	89.27	342.05	11,952.39	6,382.39	-2,810.59	6,918.57	1.55	0.28	1.52
18,910.00	90.45	344.79	11,952.61	6,468.63	-2,836.27	7,008.56	3.31	1.31	3.04
18,999.00	91.01	347.16	11,951.47	6,554.97	-2,857.83	7,097.46	2.74	0.63	2.66
19,089.00	88.94	343.82	11,951.51	6,642.08	-2,880.38	7,187.39	4.37	-2.30	-3.71
19,179.00	91.65	345.94	11,951.05	6,728.95	-2,903.85	7,277.35	3.82	3.01	2.36
19,269.00	90.89	344.85	11,949.06	6,816.02	-2,926.54	7,367.27	1.48	-0.84	-1.21
19,359.00	91.79	345.52	11,946.95	6,903.00	-2,949.54	7,457.20	1.25	1.00	0.74
19,449.00	88.77	343.75	11,946.51	6,989.77	-2,973.39	7,547.17	3.89	-3.36	-1.97
19,538.00	88.91	344.25	11,948.31	7,075.30	-2,997.91	7,636.15	0.58	0.16	0.56
19,628.00	88.55	345.05	11,950.31	7,162.07	-3,021.73	7,726.10	0.97	-0.40	0.89
19,718.00	90.22	348.72	11,951.27	7,249.70	-3,042.15	7,815.92	4.48	1.86	4.08
19,808.00	87.43	345.09	11,953.12	7,337.32	-3,062.53	7,905.71	5.09	-3.10	-4.03
19,897.00	87.31	345.52	11,957.20	7,423.32	-3,085.08	7,994.57	0.50	-0.13	0.48
19,944.00	87.15	345.31	11,959.47	7,468.75	-3,096.90	8,041.49	0.56	-0.34	-0.45
Final Phoenix MWD Survey									
20,000.00	87.15	345.31	11,962.26	7,522.85	-3,111.09	8,097.39	0.00	0.00	0.00
Projection to TD									

Survey Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
174.00	174.00	0.19	-0.06	First Phoenix MWD Survey
19,944.00	11,959.47	7,468.75	-3,096.90	Final Phoenix MWD Survey
20,000.00	11,962.26	7,522.85	-3,111.09	Projection to TD

UNIVERSITY 20 A 2003H
WELL LOCATION
1282.61 ACRES (MEASURED)
SECTIONS 17 & 20, BLOCK 20, UNIVERSITY LAND SURVEY
LOVING COUNTY, TEXAS

SHELL WESTERN
E&P

LEGEND

- UNIT BOUNDARY
BLOCK/TOWNSHIP LINE
SURVEY/SECTION LINE
PROPOSED WELL PATH
EXISTING/PERMITTED WELL PATH
CONCRETE MONUMENT
CALCULATED CORNER
WELL POINT

OWNERSHIP TABLE

MINERAL TRACT	ACREAGE
UNIVERSITY LAND BLOCK 20 SECTION 20	641.33
UNIVERSITY LAND BLOCK 20 SECTION 17	641.28
TOTAL ACREAGE	1282.61

L.T.P./B.H.L.
NAD 27 TX-C ZONE
X = 1065603.08
Y = 754842.00
LAT: N 31°42'26.25"
LONG: W 103°20'40.98"

NAD 83 TX-C ZONE
X = 1360067.62
Y = 10597418.40
LAT: N 31°42'26.72"
LONG: W 103°20'42.60"

X=1061404.95
Y=751687.03

X=1066475.01
Y=753169.27

F.T.P.
NAD 27 TX-C ZONE
X = 1065739.91
Y = 747652.84
LAT: N 31°41'15.70"
LONG: W 103°20'14.01"

NAD 83 TX-C ZONE
X = 1362204.55
Y = 10590229.13
LAT: N 31°41'16.17"
LONG: W 103°20'15.62"

P.P.
NAD 27 TX-C ZONE
X = 1065875.81
Y = 747195.61
LAT: N 31°41'11.21"
LONG: W 103°20'12.29"

NAD 83 TX-C ZONE
X = 1362340.46
Y = 10589771.89
LAT: N 31°41'11.88"
LONG: W 103°20'13.91"

X=1067958.89
Y=748093.07

X=1062888.33
Y=746610.98

S.H.L.
ELEV = 2779.0
NAD 27 TX-C ZONE
X = 1065465.80
Y = 747307.51
LAT: N 31°41'12.48"
LONG: W 103°20'05.49"

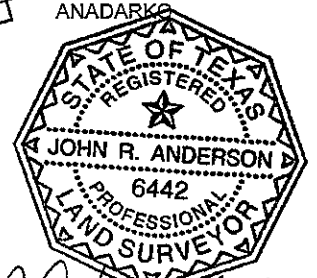
NAD 83 TX-C ZONE
X = 1362931.45
Y = 10589883.80
LAT: N 31°41'12.95"
LONG: W 103°20'07.11"

DETAIL VIEW
SCALE: 1" = 500'

TIES TABLE

POINT	UNIT	SURVEY/SECTION
S.H.L.	335' FSEL	1853' FNEL & 335' FNWL
P.P.	277' FSEL	2251' FNEL & 277' FNWL
F.T.P.	2253' FNEL	2253' FNEL & 200' FSEL
L.T.P./B.H.L.	2287' FNEL	2287' FNEL & 2411' FSEL

TOPOGRAPHIC
LOYALTY INNOVATION LEGACY
1400 EVERMAN PARKWAY, Ste. 197 • FT. WORTH, TEXAS 76140
TELEPHONE: (817) 744-7512 • FAX: (817) 744-7548
TEXAS FIRM REGISTRATION NO. 10042504
WWW.TOPOGRAPHIC.COM



John R. Anderson, R.P.L.S. No. 6442
JUNE 22, 2016

UNIVERSITY 20 A 2003H	REVISION:	
	INT	DATE
	O.M.	05/23/2016
	J.R.A.	06/22/2016
DATE:	05/04/2016	
FILE:	LO UNIVERSITY 20 A 2003 H REV2	
DRAWN BY:	O.M.	
SHEET:	1 OF 1	

NOTES:
1. ORIGINAL DOCUMENT SIZE: 11" X 17"
2. ALL BEARINGS, DISTANCES, AND COORDINATE VALUES CONTAINED HEREIN ARE GRID BASED UPON THE TEXAS STATE PLANE COORDINATE SYSTEM, CENTRAL ZONE, U.S. SURVEY FEET, NORTH AMERICAN DATUM 1927, UNLESS OTHERWISE NOTED.
3. THIS LOCATION AND/OR UNITLEASE BOUNDARY HAS BEEN CAREFULLY SURVEYED ON THE GROUND UNDER MY SUPERVISION AND IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE ACCORDING TO THE EVIDENCE, OFFICIAL SURVEY RECORDS, MAPS, AND OTHER DATA PROVIDED BY SHELL WESTERN E&P. THIS PLAT WAS CREATED FOR THE SOLE PURPOSE OF FILING A PERMIT WITH THE RAILROAD COMMISSION OF TEXAS AND SHOULD NOT BE CONSTRUED AS A "BOUNDARY SURVEY" IN COMPLIANCE WITH T.B.P.L.S. MINIMUM STANDARDS OF PROCEDURES FOR BOUNDARY SURVEYS. THIS CERTIFICATION IS MADE AND LIMITED TO THOSE PERSONS OR ENTITIES SHOWN ON THE FACE OF THIS PLAT. THIS PLAT IS NON-TRANSFERABLE. THIS SURVEY IS CERTIFIED FOR THIS TRANSACTION ONLY.
4. ALL ELEVATION VALUES CONTAINED HEREIN ARE ORTHOMETRIC ONLY, BASED UPON THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88), U.S. SURVEY FEET.
5. ALL MINERAL OWNERSHIP DATA SHOWN HEREIN IS BASED ON INFORMATION PROVIDED BY SHELL WESTERN E&P OR ITS SUBSIDIARIES & AFFILIATES.

NOTES CONT'D:
6. THE LEASE AND WELL SHOWN HEREON ARE LOCATED APPROXIMATELY ±15.6 MILES SOUTHEAST OF THE CITY/TOWNSHIP/MUNICIPALITY OF MENTONE WITHIN THE COUNTY OF LOVING IN THE STATE OF TEXAS.
7. THE PRELIMINARY LOCATION HAS BEEN CAREFULLY SURVEYED ON THE GROUND DURING THE DATE OF APRIL 25, 2016. AT A GROUND LEVEL CALCULATED ELEVATION OF 2779.0 SURVEY FEET.
8. S.H.L. = SURFACE HOLE LOCATION
9. P.P. = POINT OF PENETRATION
10. F.T.P. = FIRST TAKE POINT
11. L.T.P. = LAST TAKE POINT
12. B.H.L. = BOTTOM HOLE LOCATION

Phoenix Technology Services SURVEY DATA CERTIFICATION



PHOENIX JOB NUMBER 60214

OPERATOR Shell Oil Company

WELL NAME University 20 A 2003H

COUNTY & STATE Loving, TX

API WELL NUMBER 42301329370000

PROPOSED DIRECTION 343.45

TIE-IN DATA

MEASURED DEPTH	VERTICAL DEPTH	INCLIN	AZIMUTH	N-S COORD	E-W COORD	DATA SOURCE
0	.00 ft	0.00	0.00	.00 ft	.00 ft	Surface

FIRST SURVEY DATE	FIRST SURVEY DEPTH	INCLIN	AZIMUTH
29-Jul-16	174.00 ft	0.13	341.75

SURVEY INSTRUMENT
TYPE

Phoenix MWD

LAST SURVEY DATE	LAST SURVEY DEPTH	INCLIN	AZIMUTH
15-Sep-16	19,944.00 ft	87.15	345.31

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
15-Sep-16	20,000.00 ft	87.15	345.31

Seth Theriot

PRINT YOUR NAME ABOVE

Seth Theriot

SIGN YOUR NAME ABOVE

MAGNETIC DECLINATION OR TOTAL GRID

TOTAL CORRECTION USED	8.68
DECLINATION OR GRID	GRID

9/15/2016

TODAY'S DATE

MWD SUPERVISOR 1 Shane Metcalf

DIRECTIONAL DRILLER 1 Travis Malbrough

MWD SUPERVISOR 2 Seth Theriot

DIRECTIONAL DRILLER 2 Dustin St. Clair

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