PERMIAN

WINKLER - TEXAS CENTRAL (NAD27)
BLK 20 SEC 15
UNIVERSITY 20 1503H
4249533705
UNIVERSITY 20 1503H

Design: UNIVERSITY 20 1503H

Standard Survey Report

26 July, 2016

Shell
Survey Report

Company:	PERMIAN	**Local Co-ordinate Reference:**	Well UNIVERSITY 20 1503H
Project:	WINKLER - TEXAS CENTRAL (NAD27)	**TVD Reference:**	DFE @ 2805.90ft (PRECISION 565)
Site:	BLK 20 SEC 15	**MD Reference:**	DFE @ 2805.90ft (PRECISION 565)
Well:	UNIVERSITY 20 1503H	**North Reference:**	Grid
Wellbore:	UNIVERSITY 20 1503H	**Survey Calculation Method:**	Minimum Curvature
Design:	UNIVERSITY 20 1503H	**Database:**	EDM_UA_PRODUCTION

Project WINKLER - TEXAS CENTRAL (NAD27), PERMIAN BASIN

Map System:	UA US NAD27 (US ft)	**System Datum:**	Mean Sea Level
Geo Datum:	NAD27 (ConUS Nadcon) [1241_4267]		
Map Zone:	NAD27 / Texas Central [1241_32039]		

Site BLK 20 SEC 15

Site Position:		**Northing:**	755,262.15 usft	**Latitude:**	31° 42' 32.616 N
From:	Lat/Long	**Easting:**	1,071,876.11 usft	**Longitude:**	103° 19' 5.376 W
Position Uncertainty:	0.00 ft	**Slot Radius:**	13.200 in	**Grid Convergence:**	-1.54 °

Well UNIVERSITY 20 1503H, Exploration

Well Position	**+N/-S**	0.00 ft	**Northing:**	757,261.66 usft	**Latitude:**	31° 42' 52.687 N
	+E/-W	0.00 ft	**Easting:**	1,072,968.74 usft	**Longitude:**	103° 18' 53.352 W
Position Uncertainty		0.00 ft	**Wellhead Elevation:**	0.00 ft	**Ground Level:**	2,777.40 ft

Wellbore UNIVERSITY 20 1503H

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	06/20/2016	7.12	59.63	47,757

Design UNIVERSITY 20 1503H

Audit Notes:

Version:	1.0	**Phase:**	ACTUAL	**Tie On Depth:**	0.00

Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.00	0.00	0.00	164.68

Survey Program **Date** 07/26/2016

From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
28.50	10,234.00	PHOENIX MWD - UNIVERSITY 20 1503H	EPW MWD+SCC	MWD+Short Collar Correction-Rev 2 from Mike C
10,324.00	11,436.00	BAKER WIRELINE - UNIVERSITY 20 150	EPW DIPMETER	Dipmeter or other wireline log
11,503.00	12,355.00	PHOENIX MWD(MSA) - UNIVERSITY 20	EPW MWD	MWD-Standard Rev. 2-provided by Mike Cauley
12,453.00	20,050.00	PHOENIX MWD - UNIVERSITY 20 1503H	EPW MWD+SCC	MWD+Short Collar Correction-Rev 2 from Mike C

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28.50	0.00	360.00	28.50	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.54	51.85	200.00	0.50	0.64	-0.31	0.31	0.31	0.00
332.00	1.48	44.23	331.98	2.10	2.31	-1.42	0.72	0.71	-5.77
423.00	1.72	38.25	422.94	4.02	3.98	-2.83	0.32	0.26	-6.57
514.00	2.16	25.62	513.89	6.64	5.57	-4.93	0.67	0.48	-13.88
612.00	2.41	15.90	611.81	10.29	6.93	-8.09	0.47	0.26	-9.92
706.00	2.38	8.39	705.73	14.12	7.76	-11.57	0.34	-0.03	-7.99

Shell

Survey Report

Company:	PERMIAN	**Local Co-ordinate Reference:**	Well UNIVERSITY 20 1503H
Project:	WINKLER - TEXAS CENTRAL (NAD27)	**TVD Reference:**	DFE @ 2805.90ft (PRECISION 565)
Site:	BLK 20 SEC 15	**MD Reference:**	DFE @ 2805.90ft (PRECISION 565)
Well:	UNIVERSITY 20 1503H	**North Reference:**	Grid
Wellbore:	UNIVERSITY 20 1503H	**Survey Calculation Method:**	Minimum Curvature
Design:	UNIVERSITY 20 1503H	**Database:**	EDM_UA_PRODUCTION

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
800.00	1.79	9.33	799.67	17.50	8.28	-14.69	0.63	-0.63	1.00
894.00	1.72	325.63	893.63	20.11	7.72	-17.36	1.39	-0.07	-46.49
988.00	1.61	320.80	987.59	22.30	6.09	-19.90	0.19	-0.12	-5.14
1,083.00	1.54	320.89	1,082.55	24.32	4.44	-22.28	0.07	-0.07	0.09
1,172.00	1.37	330.98	1,171.52	26.18	3.17	-24.41	0.34	-0.19	11.34
1,263.00	1.13	328.05	1,262.50	27.89	2.17	-26.33	0.27	-0.26	-3.22
1,352.00	1.11	330.21	1,351.48	29.39	1.27	-28.01	0.05	-0.02	2.43
1,442.00	1.20	332.74	1,441.46	30.98	0.41	-29.77	0.11	0.10	2.81
1,532.00	1.29	342.46	1,531.44	32.78	-0.33	-31.71	0.25	0.10	10.80
1,621.00	1.39	356.16	1,620.42	34.82	-0.70	-33.76	0.38	0.11	15.39
1,711.00	1.68	6.10	1,710.39	37.22	-0.63	-36.06	0.44	0.32	11.04
1,801.00	1.78	14.05	1,800.35	39.88	-0.16	-38.51	0.29	0.11	8.83
1,981.00	2.46	23.78	1,980.22	46.13	2.08	-43.94	0.43	0.38	5.41
2,071.00	2.83	26.30	2,070.13	49.89	3.84	-47.10	0.43	0.41	2.80
2,160.00	3.29	30.75	2,159.00	54.06	6.12	-50.52	0.58	0.52	5.00
2,250.00	3.76	30.68	2,248.83	58.81	8.95	-54.36	0.52	0.52	-0.08
2,339.00	4.51	37.58	2,337.60	64.10	12.57	-58.50	1.01	0.84	7.75
2,429.00	5.07	39.02	2,427.28	69.99	17.23	-62.95	0.64	0.62	1.60
2,609.00	5.90	41.37	2,606.46	83.11	28.36	-72.67	0.48	0.46	1.31
2,698.00	6.69	44.28	2,694.92	90.26	35.00	-77.80	0.96	0.89	3.27
2,788.00	6.74	43.45	2,784.30	97.84	42.29	-83.19	0.12	0.06	-0.92
2,968.00	6.70	44.05	2,963.07	113.06	56.86	-94.02	0.04	-0.02	0.33
3,057.00	6.81	44.61	3,051.45	120.55	64.17	-99.31	0.14	0.12	0.63
3,147.00	6.90	44.85	3,140.80	128.18	71.73	-104.67	0.10	0.10	0.27
3,237.00	6.72	43.19	3,230.17	135.85	79.15	-110.11	0.30	-0.20	-1.84
3,326.00	6.22	45.51	3,318.60	143.03	86.15	-115.18	0.63	-0.56	2.61
3,416.00	5.70	46.36	3,408.12	149.53	92.87	-119.68	0.59	-0.58	0.94
3,506.00	5.53	48.84	3,497.68	155.47	99.36	-123.69	0.33	-0.19	2.76
3,596.00	5.37	48.77	3,587.28	161.10	105.80	-127.42	0.18	-0.18	-0.08
3,686.00	5.27	49.58	3,676.89	166.55	112.11	-131.01	0.14	-0.11	0.90
3,776.00	5.36	51.23	3,766.50	171.86	118.53	-134.44	0.20	0.10	1.83
3,865.00	6.03	62.01	3,855.07	176.66	125.90	-137.12	1.41	0.75	12.11
3,955.00	6.68	65.92	3,944.51	181.02	134.86	-138.95	0.87	0.72	4.34
4,045.00	6.43	66.41	4,033.92	185.17	144.25	-140.47	0.28	-0.28	0.54
4,135.00	6.62	66.58	4,123.34	189.25	153.63	-141.93	0.21	0.21	0.19
4,225.00	6.19	68.89	4,212.78	193.06	162.92	-143.15	0.56	-0.48	2.57
4,405.00	5.13	65.78	4,391.90	199.85	179.31	-145.37	0.61	-0.59	-1.73
4,584.00	6.19	69.35	4,570.03	206.54	195.64	-147.51	0.62	0.59	1.99
4,674.00	5.79	70.38	4,659.53	209.77	204.46	-148.30	0.46	-0.44	1.14
4,764.00	6.50	76.06	4,749.02	212.53	213.68	-148.52	1.04	0.79	6.31
4,853.00	6.40	76.86	4,837.45	214.87	223.40	-148.21	0.15	-0.11	0.90
4,956.00	5.74	76.04	4,939.88	217.42	233.99	-147.87	0.65	-0.64	-0.80
5,117.00	3.20	80.05	5,100.37	220.13	246.23	-147.26	1.59	-1.58	2.49

Company:	PERMIAN	**Local Co-ordinate Reference:**	Well UNIVERSITY 20 1503H
Project:	WINKLER - TEXAS CENTRAL (NAD27)	**TVD Reference:**	DFE @ 2805.90ft (PRECISION 565)
Site:	BLK 20 SEC 15	**MD Reference:**	DFE @ 2805.90ft (PRECISION 565)
Well:	UNIVERSITY 20 1503H	**North Reference:**	Grid
Wellbore:	UNIVERSITY 20 1503H	**Survey Calculation Method:**	Minimum Curvature
Design:	UNIVERSITY 20 1503H	**Database:**	EDM_UA_PRODUCTION

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
5,207.00	2.52	70.75	5,190.26	221.22	250.57	-147.16	0.91	-0.76	-10.33
5,297.00	2.16	35.88	5,280.19	223.25	253.43	-148.35	1.60	-0.40	-38.74
5,387.00	2.03	29.24	5,370.13	226.01	255.21	-150.55	0.31	-0.14	-7.38
5,476.00	0.86	26.28	5,459.10	227.99	256.27	-152.18	1.32	-1.31	-3.33
5,566.00	1.09	36.91	5,549.09	229.28	257.09	-153.21	0.32	0.26	11.81
5,656.00	1.24	37.79	5,639.07	230.73	258.20	-154.31	0.17	0.17	0.98
5,836.00	1.03	42.10	5,819.03	233.47	260.47	-156.35	0.13	-0.12	2.39
5,926.00	1.03	27.11	5,909.02	234.79	261.39	-157.39	0.30	0.00	-16.66
6,015.00	1.00	29.22	5,998.00	236.18	262.13	-158.53	0.05	-0.03	2.37
6,105.00	1.08	23.72	6,087.99	237.64	262.85	-159.75	0.14	0.09	-6.11
6,195.00	1.05	26.54	6,177.97	239.16	263.56	-161.02	0.07	-0.03	3.13
6,285.00	1.15	26.14	6,267.96	240.71	264.33	-162.31	0.11	0.11	-0.44
6,374.00	1.03	32.70	6,356.94	242.18	265.16	-163.52	0.19	-0.13	7.37
6,464.00	0.92	41.77	6,446.93	243.40	266.07	-164.45	0.21	-0.12	10.08
6,554.00	1.04	35.83	6,536.92	244.60	267.03	-165.36	0.17	0.13	-6.60
6,644.00	1.09	40.54	6,626.90	245.91	268.07	-166.35	0.11	0.06	5.23
6,733.00	1.46	38.21	6,715.88	247.45	269.32	-167.50	0.42	0.42	-2.62
6,823.00	1.33	37.96	6,805.85	249.17	270.67	-168.80	0.14	-0.14	-0.28
6,913.00	1.57	30.13	6,895.82	251.06	271.93	-170.29	0.35	0.27	-8.70
7,003.00	1.37	37.16	6,985.79	252.99	273.20	-171.81	0.30	-0.22	7.81
7,092.00	1.25	36.29	7,074.77	254.62	274.42	-173.06	0.14	-0.13	-0.98
7,182.00	0.99	26.62	7,164.75	256.10	275.35	-174.25	0.36	-0.29	-10.74
7,272.00	0.50	7.31	7,254.74	257.19	275.75	-175.19	0.60	-0.54	-21.46
7,451.00	0.21	338.03	7,433.74	258.27	275.72	-176.24	0.19	-0.16	-16.36
7,541.00	0.34	300.40	7,523.74	258.55	275.43	-176.60	0.24	0.14	-41.81
7,631.00	0.20	207.47	7,613.74	258.55	275.13	-176.67	0.45	-0.16	-103.26
7,720.00	0.89	173.75	7,702.74	257.73	275.13	-175.87	0.82	0.78	-37.89
7,810.00	1.08	181.69	7,792.72	256.18	275.18	-174.37	0.26	0.21	8.82
7,900.00	1.10	170.44	7,882.71	254.48	275.30	-172.70	0.24	0.02	-12.50
7,990.00	1.22	176.27	7,972.69	252.67	275.51	-170.90	0.19	0.13	6.48
8,079.00	1.21	175.99	8,061.67	250.79	275.63	-169.06	0.01	-0.01	-0.31
8,169.00	1.18	168.85	8,151.65	248.93	275.88	-167.20	0.17	-0.03	-7.93
8,259.00	1.26	170.35	8,241.63	247.05	276.22	-165.29	0.10	0.09	1.67
8,349.00	1.29	183.50	8,331.61	245.06	276.33	-163.35	0.33	0.03	14.61
8,439.00	1.28	184.96	8,421.58	243.05	276.18	-161.44	0.04	-0.01	1.62
8,528.00	1.23	183.67	8,510.56	241.11	276.03	-159.61	0.06	-0.06	-1.45
8,618.00	1.18	187.43	8,600.54	239.22	275.85	-157.84	0.10	-0.06	4.18
8,708.00	1.39	181.21	8,690.52	237.21	275.71	-155.94	0.28	0.23	-6.91
8,797.00	1.55	187.69	8,779.49	234.94	275.52	-153.80	0.26	0.18	7.28
8,887.00	1.56	187.25	8,869.46	232.52	275.21	-151.55	0.02	0.01	-0.49
8,977.00	1.59	188.87	8,959.42	230.07	274.86	-149.28	0.06	0.03	1.80
9,066.00	1.78	197.41	9,048.38	227.53	274.26	-146.99	0.35	0.21	9.60
9,156.00	1.63	186.73	9,138.34	224.93	273.69	-144.62	0.39	-0.17	-11.87
9,246.00	1.70	167.10	9,228.31	222.36	273.84	-142.10	0.64	0.08	-21.81

Company:	PERMIAN	**Local Co-ordinate Reference:**	Well UNIVERSITY 20 1503H
Project:	WINKLER - TEXAS CENTRAL (NAD27)	**TVD Reference:**	DFE @ 2805.90ft (PRECISION 565)
Site:	BLK 20 SEC 15	**MD Reference:**	DFE @ 2805.90ft (PRECISION 565)
Well:	UNIVERSITY 20 1503H	**North Reference:**	Grid
Wellbore:	UNIVERSITY 20 1503H	**Survey Calculation Method:**	Minimum Curvature
Design:	UNIVERSITY 20 1503H	**Database:**	EDM_UA_PRODUCTION

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
9,338.00	2.24	152.34	9,320.25	219.43	274.97	-138.98	0.80	0.59	-16.04
9,427.00	1.86	155.05	9,409.20	216.58	276.39	-135.86	0.44	-0.43	3.04
9,517.00	2.14	186.63	9,499.14	213.59	276.81	-132.86	1.25	0.31	35.09
9,607.00	3.09	201.98	9,589.05	209.67	275.71	-129.37	1.30	1.06	17.06
9,696.00	2.75	205.72	9,677.93	205.52	273.89	-125.86	0.44	-0.38	4.20
9,786.00	2.06	208.79	9,767.85	202.16	272.17	-123.07	0.78	-0.77	3.41
9,876.00	1.00	195.88	9,857.82	199.99	271.18	-121.23	1.23	-1.18	-14.34
9,965.00	1.08	195.45	9,946.81	198.43	270.74	-119.85	0.09	0.09	-0.48
10,055.00	1.01	220.11	10,036.79	197.01	270.00	-118.67	0.50	-0.08	27.40
10,145.00	1.49	297.77	10,126.78	196.95	268.46	-119.02	1.79	0.53	86.29
10,234.00	2.50	335.06	10,215.72	199.24	266.62	-121.72	1.79	1.13	41.90
10,324.00	2.80	343.04	10,305.63	203.13	265.15	-125.85	0.53	0.33	8.87
10,414.00	2.60	352.94	10,395.53	207.26	264.25	-130.07	0.56	-0.22	11.00
10,504.00	2.50	1.84	10,485.44	211.24	264.07	-133.97	0.45	-0.11	9.89
10,594.00	2.30	1.24	10,575.36	215.01	264.17	-137.57	0.22	-0.22	-0.67
10,684.00	2.10	344.74	10,665.30	218.41	263.77	-140.95	0.74	-0.22	-18.33
10,774.00	2.20	330.64	10,755.23	221.50	262.49	-144.28	0.60	0.11	-15.67
10,864.00	2.90	325.54	10,845.14	224.89	260.36	-148.11	0.82	0.78	-5.67
10,954.00	2.80	328.24	10,935.03	228.63	257.91	-152.37	0.19	-0.11	3.00
11,044.00	2.10	316.34	11,024.95	231.69	255.62	-155.92	0.96	-0.78	-13.22
11,134.00	1.80	303.64	11,114.90	233.67	253.30	-158.44	0.58	-0.33	-14.11
11,224.00	1.10	300.34	11,204.87	234.89	251.38	-160.13	0.78	-0.78	-3.67
11,314.00	0.30	300.44	11,294.86	235.45	250.43	-160.91	0.89	-0.89	0.11
11,404.00	0.30	265.64	11,384.86	235.55	249.99	-161.13	0.20	0.00	-38.67
11,436.00	0.50	200.14	11,416.86	235.41	249.86	-161.03	1.45	0.63	-204.69
11,503.00	5.36	199.75	11,483.75	232.19	248.70	-158.23	7.25	7.25	-0.58
11,592.00	16.65	202.73	11,570.97	216.46	242.35	-144.74	12.70	12.69	3.35
11,682.00	26.41	199.53	11,654.60	185.63	230.65	-118.10	10.92	10.84	-3.56
11,772.00	36.60	196.83	11,731.23	140.97	216.15	-78.85	11.43	11.32	-3.00
11,862.00	41.97	198.43	11,800.87	86.70	198.85	-31.08	6.07	5.97	1.78
11,951.00	49.90	197.49	11,862.72	25.90	179.18	22.36	8.94	8.91	-1.06
12,041.00	58.30	189.54	11,915.50	-44.89	162.45	86.21	11.75	9.33	-8.83
12,131.00	68.06	182.80	11,956.09	-124.60	154.03	160.87	12.73	10.84	-7.49
12,220.00	72.98	181.36	11,985.77	-208.42	151.01	240.92	5.73	5.53	-1.62
12,310.00	79.86	177.21	12,006.89	-295.83	152.14	325.51	8.86	7.64	-4.61
12,355.00	85.49	174.26	12,012.63	-340.31	155.47	369.30	14.10	12.51	-6.56
12,453.00	90.16	172.38	12,016.35	-437.55	166.86	466.08	5.14	4.77	-1.92
12,543.00	88.67	171.31	12,017.27	-526.63	179.62	555.37	2.04	-1.66	-1.19
12,630.00	89.22	170.98	12,018.87	-612.58	193.01	641.80	0.74	0.63	-0.38
12,720.00	89.86	171.53	12,019.59	-701.53	206.70	731.21	0.94	0.71	0.61
12,810.00	91.18	172.58	12,018.78	-790.65	219.14	820.46	1.87	1.47	1.17
12,899.00	90.20	167.74	12,017.70	-878.31	234.34	909.02	5.55	-1.10	-5.44
12,989.00	90.78	168.52	12,016.93	-966.38	252.85	998.85	1.08	0.64	0.87

Company:	PERMIAN	**Local Co-ordinate Reference:**	Well UNIVERSITY 20 1503H
Project:	WINKLER - TEXAS CENTRAL (NAD27)	**TVD Reference:**	DFE @ 2805.90ft (PRECISION 565)
Site:	BLK 20 SEC 15	**MD Reference:**	DFE @ 2805.90ft (PRECISION 565)
Well:	UNIVERSITY 20 1503H	**North Reference:**	Grid
Wellbore:	UNIVERSITY 20 1503H	**Survey Calculation Method:**	Minimum Curvature
Design:	UNIVERSITY 20 1503H	**Database:**	EDM_UA_PRODUCTION

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
13,078.00	90.22	169.66	12,016.16	-1,053.77	269.69	1,087.58	1.43	-0.63	1.28
13,168.00	90.42	172.76	12,015.65	-1,142.70	283.45	1,176.98	3.45	0.22	3.44
13,258.00	89.80	171.03	12,015.48	-1,231.80	296.13	1,266.27	2.04	-0.69	-1.92
13,350.00	91.37	173.37	12,014.54	-1,322.93	308.62	1,357.46	3.06	1.71	2.54
13,440.00	91.12	170.31	12,012.59	-1,411.99	321.39	1,446.73	3.41	-0.28	-3.40
13,530.00	89.78	166.07	12,011.88	-1,500.06	339.80	1,536.53	4.94	-1.49	-4.71
13,619.00	89.30	164.18	12,012.59	-1,586.07	362.65	1,625.52	2.19	-0.54	-2.12
13,709.00	91.90	167.01	12,011.65	-1,673.22	385.03	1,715.49	4.27	2.89	3.14
13,799.00	91.45	166.21	12,009.02	-1,760.73	405.87	1,805.40	1.02	-0.50	-0.89
13,888.00	91.09	165.63	12,007.05	-1,847.04	427.51	1,894.36	0.77	-0.40	-0.65
13,978.00	91.59	168.82	12,004.94	-1,934.77	447.41	1,984.23	3.59	0.56	3.54
14,068.00	91.82	168.58	12,002.26	-2,022.99	465.03	2,073.97	0.37	0.26	-0.27
14,158.00	90.28	165.22	12,000.62	-2,110.62	485.43	2,163.87	4.11	-1.71	-3.73
14,248.00	90.45	161.27	12,000.04	-2,196.78	511.37	2,253.82	4.39	0.19	-4.39
14,337.00	90.67	160.70	11,999.17	-2,280.92	540.36	2,342.63	0.69	0.25	-0.64
14,427.00	89.66	158.87	11,998.91	-2,365.37	571.46	2,432.30	2.32	-1.12	-2.03
14,517.00	90.42	163.59	11,998.85	-2,450.56	600.41	2,522.11	5.31	0.84	5.24
14,607.00	91.15	167.85	11,997.62	-2,537.75	622.60	2,612.07	4.80	0.81	4.73
14,696.00	90.25	163.40	11,996.53	-2,623.93	644.69	2,701.03	5.10	-1.01	-5.00
14,786.00	89.10	160.80	11,997.04	-2,709.57	672.35	2,790.92	3.16	-1.28	-2.89
14,876.00	90.00	166.23	11,997.75	-2,795.83	697.88	2,880.87	6.12	1.00	6.03
14,966.00	90.59	171.93	11,997.28	-2,884.16	714.92	2,970.56	6.37	0.66	6.33
15,055.00	89.50	168.80	11,997.21	-2,971.90	729.81	3,059.11	3.72	-1.22	-3.52
15,145.00	90.00	165.89	11,997.61	-3,059.70	749.53	3,149.01	3.28	0.56	-3.23
15,235.00	90.42	163.19	11,997.28	-3,146.43	773.52	3,239.00	3.04	0.47	-3.00
15,325.00	91.71	159.42	11,995.60	-3,231.65	802.35	3,328.81	4.43	1.43	-4.19
15,414.00	91.73	158.73	11,992.93	-3,314.75	834.12	3,417.34	0.78	0.02	-0.78
15,503.00	91.84	157.70	11,990.16	-3,397.35	867.14	3,505.73	1.16	0.12	-1.16
15,593.00	92.15	159.27	11,987.02	-3,481.02	900.12	3,595.15	1.78	0.34	1.74
15,682.00	88.21	157.34	11,986.75	-3,563.70	933.02	3,683.58	4.93	-4.43	-2.17
15,772.00	87.82	157.38	11,989.86	-3,646.71	967.64	3,772.79	0.44	-0.43	0.04
15,861.00	86.34	157.28	11,994.40	-3,728.73	1,001.90	3,860.94	1.67	-1.66	-0.11
15,951.00	88.02	157.98	11,998.82	-3,811.85	1,036.11	3,950.15	2.02	1.87	0.78
16,041.00	87.77	158.50	12,002.13	-3,895.38	1,069.45	4,039.52	0.64	-0.28	0.58
16,131.00	88.80	160.11	12,004.82	-3,979.53	1,101.24	4,129.08	2.12	1.14	1.79
16,220.00	88.72	160.29	12,006.75	-4,063.25	1,131.38	4,217.79	0.22	-0.09	0.20
16,310.00	90.73	161.73	12,007.18	-4,148.35	1,160.66	4,307.59	2.75	2.23	1.60
16,400.00	89.08	159.53	12,007.33	-4,233.24	1,190.51	4,397.36	3.06	-1.83	-2.44
16,489.00	91.90	161.13	12,006.57	-4,317.04	1,220.46	4,486.09	3.64	3.17	1.80
16,579.00	92.15	161.72	12,003.39	-4,402.29	1,249.11	4,575.89	0.71	0.28	0.66
16,668.00	92.07	161.53	12,000.11	-4,486.70	1,277.15	4,664.70	0.23	-0.09	-0.21
16,758.00	88.85	157.52	11,999.39	-4,570.98	1,308.62	4,754.30	5.71	-3.58	-4.46
16,848.00	89.97	159.21	12,000.32	-4,654.63	1,341.80	4,843.75	2.25	1.24	1.88

Company:	PERMIAN	**Local Co-ordinate Reference:**	Well UNIVERSITY 20 1503H
Project:	WINKLER - TEXAS CENTRAL (NAD27)	**TVD Reference:**	DFE @ 2805.90ft (PRECISION 565)
Site:	BLK 20 SEC 15	**MD Reference:**	DFE @ 2805.90ft (PRECISION 565)
Well:	UNIVERSITY 20 1503H	**North Reference:**	Grid
Wellbore:	UNIVERSITY 20 1503H	**Survey Calculation Method:**	Minimum Curvature
Design:	UNIVERSITY 20 1503H	**Database:**	EDM_UA_PRODUCTION

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
16,938.00	90.61	160.52	11,999.86	-4,739.13	1,372.78	4,933.43	1.62	0.71	1.46
17,027.00	90.75	161.84	11,998.80	-4,823.36	1,401.49	5,022.25	1.49	0.16	1.48
17,118.00	90.70	163.10	11,997.65	-4,910.13	1,428.89	5,113.18	1.39	-0.05	1.38
17,208.00	89.52	163.21	11,997.48	-4,996.26	1,454.97	5,203.14	1.32	-1.31	0.12
17,298.00	89.58	163.20	11,998.19	-5,082.42	1,480.98	5,293.11	0.07	0.07	-0.01
17,388.00	89.08	161.80	11,999.24	-5,168.25	1,508.04	5,383.04	1.65	-0.56	-1.56
17,477.00	92.32	166.19	11,998.15	-5,253.76	1,532.57	5,471.99	6.13	3.64	4.93
17,567.00	91.93	165.81	11,994.82	-5,341.03	1,554.33	5,561.90	0.60	-0.43	-0.42
17,656.00	89.13	164.60	11,993.99	-5,427.06	1,577.05	5,650.88	3.43	-3.15	-1.36
17,746.00	89.22	165.09	11,995.29	-5,513.92	1,600.58	5,740.87	0.55	0.10	0.54
17,834.00	89.36	164.08	11,996.38	-5,598.75	1,623.97	5,828.87	1.16	0.16	-1.15
17,923.00	89.19	165.46	11,997.50	-5,684.61	1,647.34	5,917.86	1.56	-0.19	1.55
18,013.00	89.55	165.74	11,998.49	-5,771.78	1,669.72	6,007.84	0.51	0.40	0.31
18,103.00	90.25	164.17	11,998.65	-5,858.69	1,693.09	6,097.84	1.91	0.78	-1.74
18,193.00	90.70	163.86	11,997.90	-5,945.21	1,717.87	6,187.83	0.61	0.50	-0.34
18,283.00	88.97	160.72	11,998.16	-6,030.93	1,745.24	6,277.73	3.98	-1.92	-3.49
18,372.00	90.28	165.30	11,998.75	-6,116.02	1,771.24	6,366.67	5.35	1.47	5.15
18,440.00	89.92	163.68	11,998.63	-6,181.54	1,789.42	6,434.66	2.44	-0.53	-2.38
18,530.00	89.69	163.91	11,998.93	-6,267.96	1,814.54	6,524.65	0.36	-0.26	0.26
18,620.00	89.78	165.24	11,999.35	-6,354.72	1,838.48	6,614.65	1.48	0.10	1.48
18,709.00	90.08	164.96	11,999.46	-6,440.73	1,861.36	6,703.65	0.46	0.34	-0.31
18,799.00	89.92	163.40	11,999.46	-6,527.31	1,885.90	6,793.64	1.74	-0.18	-1.73
18,889.00	90.45	166.47	11,999.17	-6,614.21	1,909.29	6,883.63	3.46	0.59	3.41
18,979.00	90.73	166.68	11,998.24	-6,701.75	1,930.18	6,973.57	0.39	0.31	0.23
19,069.00	90.92	167.97	11,996.95	-6,789.54	1,949.93	7,063.47	1.45	0.21	1.43
19,159.00	91.04	168.85	11,995.41	-6,877.69	1,968.00	7,153.26	0.99	0.13	0.98
19,248.00	89.61	167.71	11,994.90	-6,964.83	1,986.08	7,242.08	2.05	-1.61	-1.28
19,338.00	89.72	167.90	11,995.43	-7,052.80	2,005.09	7,331.95	0.24	0.12	0.21
19,428.00	89.69	170.22	11,995.89	-7,141.16	2,022.17	7,421.68	2.58	-0.03	2.58
19,518.00	91.51	173.15	11,994.95	-7,230.19	2,035.19	7,510.99	3.83	2.02	3.26
19,607.00	91.87	173.29	11,992.32	-7,318.53	2,045.69	7,598.96	0.43	0.40	0.16
19,697.00	91.12	172.89	11,989.98	-7,407.85	2,056.51	7,687.96	0.94	-0.83	-0.44
19,786.00	89.72	172.33	11,989.32	-7,496.10	2,067.96	7,776.11	1.69	-1.57	-0.63
19,876.00	89.16	173.65	11,990.20	-7,585.42	2,078.94	7,865.15	1.59	-0.62	1.47
19,965.00	89.66	174.83	11,991.12	-7,673.97	2,087.87	7,952.91	1.44	0.56	1.33
19,994.00	90.22	176.55	11,991.15	-7,702.88	2,090.05	7,981.38	6.24	1.93	5.93
20,050.00	90.22	176.55	11,990.94	-7,758.78	2,093.42	8,036.18	0.00	0.00	0.00

Company:	PERMIAN	**Local Co-ordinate Reference:**	Well UNIVERSITY 20 1503H
Project:	WINKLER - TEXAS CENTRAL (NAD27)	**TVD Reference:**	DFE @ 2805.90ft (PRECISION 565)
Site:	BLK 20 SEC 15	**MD Reference:**	DFE @ 2805.90ft (PRECISION 565)
Well:	UNIVERSITY 20 1503H	**North Reference:**	Grid
Wellbore:	UNIVERSITY 20 1503H	**Survey Calculation Method:**	Minimum Curvature
Design:	UNIVERSITY 20 1503H	**Database:**	EDM_UA_PRODUCTION

Casing Points

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)
148.50	148.50	Conductor - run	20.000	30.000
5,030.00	5,013.57	Surface Casing	9.625	12.250
12,395.00	12,015.11	Intermediate Casing	7.000	7.000
20,050.00	11,990.94	Production Liner	4.500	6.125

Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates +N/-S (ft)	Local Coordinates +E/-W (ft)	Comment
20,050.00	11,990.94	-7,758.78	2,093.42	PROJ TO 20050' MD

Checked By: _____ Approved By: _____ Date: _____