



Hunt Oil Company

Upton County, Texas (NAD 27)

University 3-36

#2HB

Wellbore #1 Job #1410826

Survey: Phoenix MWD Surveys

Standard Survey Report

26 July, 2014



Company:	Hunt Oil Company	Local Co-ordinate Reference:	Well #2HB
Project:	Upton County, Texas (NAD 27)	TVD Reference:	WELL @ 2613.00usft (Orion 10)
Site:	University 3-36	MD Reference:	WELL @ 2613.00usft (Orion 10)
Well:	#2HB	North Reference:	Grid
Wellbore:	Wellbore #1 Job #1410826	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Orion 10)	Database:	Compass 5000 GCR DB

Project	Upton County, Texas (NAD 27)		
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 3-36		
Site Position:		Northing:	572,271.79 usft
From:	Map	Easting:	1,519,837.10 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	31° 13' 51.90218 N
		Longitude:	101° 52' 10.81174 W
		Grid Convergence:	-0.79 °

Well	#2HB		
Well Position	+N/-S	0.00 usft	Northing: 572,271.79 usft
	+E/-W	0.00 usft	Easting: 1,519,837.10 usft
Position Uncertainty	0.00 usft	Wellhead Elevation:	usft
		Latitude:	31° 13' 51.90218 N
		Longitude:	101° 52' 10.81174 W
		Ground Level:	2,588.00 usft

Wellbore	Wellbore #1 Job #1410826				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010_14	05/14/14	6.35	59.46	47,900

Design	Surveys (Orion 10)				
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	181.37	

Survey Program	Date	07/26/14			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
100.00	4,560.00	Gyro Surveys (Wellbore #1 Job #1410826	NS-GYRO-MS	North sensing gyrocompassing m/s	
4,701.00	15,707.00	Phoenix MWD Surveys (Wellbore #1 Job #	PHX+MWD+IGRF	PHX+MWD+IGRF v3:standard declination	

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
4,560.00	0.47	30.65	4,559.90	3.47	15.28	-3.83	0.00	0.00	0.00	
Gyro Tie-in										
4,701.00	0.80	74.50	4,700.89	4.23	16.52	-4.62	0.40	0.23	31.10	
First Phoenix Survey										
4,796.00	0.80	67.10	4,795.88	4.67	17.77	-5.09	0.11	0.00	-7.79	
4,891.00	0.70	77.10	4,890.87	5.05	18.95	-5.51	0.17	-0.11	10.53	
4,986.00	0.60	47.10	4,985.86	5.52	19.88	-6.00	0.37	-0.11	-31.58	
5,018.00	0.90	41.00	5,017.86	5.83	20.17	-6.31	0.97	0.94	-19.06	
5,049.00	0.80	28.00	5,048.86	6.20	20.43	-6.69	0.70	-0.32	-41.94	

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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)	
5,081.00	0.60	15.80	5,080.86	6.56	20.58	-7.05	0.78	-0.63	-38.13	
5,142.00	0.40	320.50	5,141.85	7.03	20.53	-7.52	0.81	-0.33	-90.66	
5,176.00	0.80	295.70	5,175.85	7.22	20.24	-7.71	1.38	1.18	-72.94	
5,208.00	1.10	286.60	5,207.85	7.41	19.75	-7.88	1.05	0.94	-28.44	
5,240.00	1.90	279.00	5,239.84	7.58	18.93	-8.03	2.57	2.50	-23.75	
5,272.00	2.90	281.80	5,271.81	7.83	17.61	-8.25	3.15	3.13	8.75	
5,303.00	4.00	278.90	5,302.75	8.16	15.78	-8.53	3.59	3.55	-9.35	
5,334.00	4.90	280.10	5,333.66	8.56	13.40	-8.87	2.92	2.90	3.87	
5,366.00	6.00	278.80	5,365.51	9.05	10.41	-9.30	3.46	3.44	-4.06	
5,398.00	6.90	280.30	5,397.31	9.65	6.86	-9.81	2.86	2.81	4.69	
5,430.00	7.40	278.90	5,429.06	10.31	2.93	-10.38	1.65	1.56	-4.38	
5,462.00	7.70	278.80	5,460.78	10.96	-1.22	-10.93	0.94	0.94	-0.31	
5,493.00	7.80	278.10	5,491.50	11.57	-5.36	-11.44	0.44	0.32	-2.26	
5,557.00	8.10	278.30	5,554.88	12.84	-14.12	-12.50	0.47	0.47	0.31	
5,621.00	8.60	275.80	5,618.21	13.97	-23.34	-13.41	0.97	0.78	-3.91	
5,652.00	8.50	272.70	5,648.86	14.31	-27.93	-13.64	1.52	-0.32	-10.00	
5,716.00	8.40	266.70	5,712.17	14.27	-37.33	-13.37	1.39	-0.16	-9.38	
5,748.00	8.50	265.70	5,743.82	13.96	-42.02	-12.95	0.56	0.31	-3.13	
5,779.00	8.00	264.80	5,774.50	13.59	-46.45	-12.47	1.67	-1.61	-2.90	
5,843.00	7.70	261.60	5,837.90	12.56	-55.13	-11.24	0.83	-0.47	-5.00	
5,938.00	7.90	259.20	5,932.02	10.41	-67.84	-8.78	0.40	0.21	-2.53	
6,033.00	8.20	260.00	6,026.09	8.01	-80.92	-6.07	0.34	0.32	0.84	
6,096.00	6.70	269.90	6,088.55	7.22	-89.02	-5.09	3.13	-2.38	15.71	
6,191.00	6.80	266.00	6,182.90	6.82	-100.17	-4.42	0.49	0.11	-4.11	
6,223.00	6.80	263.90	6,214.67	6.48	-103.95	-4.00	0.78	0.00	-6.56	
6,374.00	6.80	274.60	6,364.62	6.25	-121.75	-3.34	0.84	0.00	7.09	
6,472.00	6.30	278.90	6,461.98	7.55	-132.84	-4.37	0.71	-0.51	4.39	
6,566.00	5.50	284.70	6,555.48	9.49	-142.30	-6.08	1.06	-0.85	6.17	
6,661.00	5.40	289.80	6,650.05	12.16	-150.91	-8.55	0.52	-0.11	5.37	
6,756.00	6.20	300.30	6,744.56	16.26	-159.54	-12.44	1.40	0.84	11.05	
6,852.00	6.40	308.40	6,839.99	22.20	-168.21	-18.17	0.95	0.21	8.44	
6,946.00	5.70	304.80	6,933.46	28.12	-176.15	-23.90	0.85	-0.74	-3.83	
7,041.00	4.50	298.80	7,028.09	32.61	-183.29	-28.21	1.38	-1.26	-6.32	
7,137.00	3.50	287.70	7,123.85	35.31	-189.38	-30.77	1.31	-1.04	-11.56	
7,232.00	2.90	282.90	7,218.70	36.73	-194.49	-32.07	0.69	-0.63	-5.05	
7,327.00	2.50	266.20	7,313.60	37.13	-198.90	-32.36	0.92	-0.42	-17.58	
7,422.00	2.90	249.40	7,408.50	36.15	-203.21	-31.28	0.93	0.42	-17.68	
7,517.00	2.80	253.80	7,503.38	34.65	-207.69	-29.68	0.25	-0.11	4.63	
7,613.00	2.30	261.90	7,599.28	33.73	-211.85	-28.65	0.64	-0.52	8.44	
7,708.00	2.40	256.00	7,694.20	32.98	-215.67	-27.81	0.28	0.11	-6.21	
7,740.00	2.60	244.80	7,726.17	32.51	-216.97	-27.31	1.65	0.63	-35.00	
7,773.00	3.30	234.80	7,759.13	31.64	-218.43	-26.41	2.63	2.12	-30.30	
7,805.00	4.50	229.10	7,791.05	30.29	-220.13	-25.02	3.94	3.75	-17.81	

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Survey									
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7,835.00	6.10	222.10	7,820.93	28.33	-222.09	-23.02	5.74	5.33	-23.33
7,868.00	7.90	216.90	7,853.68	25.22	-224.62	-19.84	5.78	5.45	-15.76
7,900.00	10.10	212.70	7,885.28	21.10	-227.46	-15.65	7.17	6.88	-13.13
7,986.00	13.40	201.20	7,969.48	5.46	-235.14	0.17	4.69	3.84	-13.37
8,018.00	17.00	196.20	8,000.36	-2.50	-237.79	8.18	11.96	11.25	-15.63
8,049.00	21.00	192.30	8,029.66	-12.28	-240.24	18.02	13.53	12.90	-12.58
8,081.00	24.80	190.00	8,059.14	-24.50	-242.63	30.29	12.20	11.88	-7.19
8,113.00	28.50	187.70	8,087.73	-38.68	-244.81	44.52	12.00	11.56	-7.19
8,145.00	32.80	184.90	8,115.26	-54.89	-246.58	60.77	14.16	13.44	-8.75
8,176.00	36.60	181.80	8,140.74	-72.50	-247.59	78.40	13.51	12.26	-10.00
8,208.00	40.80	179.60	8,165.71	-92.50	-247.81	98.39	13.81	13.13	-6.88
8,240.00	43.60	179.00	8,189.41	-113.99	-247.55	119.87	8.84	8.75	-1.88
8,271.00	46.20	175.70	8,211.37	-135.84	-246.52	141.69	11.26	8.39	-10.65
8,303.00	48.70	175.10	8,233.01	-159.33	-244.63	165.14	7.93	7.81	-1.88
8,335.00	51.70	174.90	8,253.49	-183.82	-242.49	189.57	9.39	9.38	-0.63
8,367.00	55.80	177.00	8,272.41	-209.56	-240.68	215.25	13.86	12.81	6.56
8,398.00	59.00	176.90	8,289.11	-235.63	-239.29	241.29	10.33	10.32	-0.32
8,430.00	61.60	174.60	8,304.97	-263.35	-237.22	268.94	10.25	8.13	-7.19
8,462.00	63.60	174.20	8,319.69	-291.62	-234.45	297.14	6.35	6.25	-1.25
8,494.00	65.80	173.10	8,333.37	-320.37	-231.24	325.81	7.54	6.88	-3.44
8,526.00	68.30	172.70	8,345.84	-349.61	-227.60	354.95	7.90	7.81	-1.25
8,558.00	70.10	172.30	8,357.21	-379.26	-223.70	384.50	5.75	5.63	-1.25
8,589.00	70.50	173.50	8,367.66	-408.23	-220.09	413.37	3.87	1.29	3.87
8,621.00	71.30	173.00	8,378.13	-438.25	-216.54	443.31	2.90	2.50	-1.56
8,653.00	75.40	174.30	8,387.30	-468.72	-213.15	473.68	13.39	12.81	4.06
8,685.00	77.10	176.80	8,394.90	-499.70	-210.74	504.60	9.26	5.31	7.81
8,717.00	78.70	176.40	8,401.61	-530.94	-208.88	535.78	5.15	5.00	-1.25
8,748.00	79.20	177.20	8,407.55	-561.31	-207.19	566.11	3.00	1.61	2.58
8,780.00	79.50	176.40	8,413.47	-592.71	-205.43	597.46	2.63	0.94	-2.50
8,801.00	80.40	176.10	8,417.13	-613.35	-204.08	618.05	4.51	4.29	-1.43
8,831.00	83.10	177.10	8,421.44	-642.98	-202.32	647.63	9.59	9.00	3.33
8,862.00	85.20	177.70	8,424.59	-673.79	-200.92	678.40	7.04	6.77	1.94
8,892.00	86.60	178.30	8,426.74	-703.69	-199.88	708.27	5.08	4.67	2.00
8,923.00	87.10	178.40	8,428.44	-734.63	-198.98	739.18	1.64	1.61	0.32
8,954.00	88.00	178.40	8,429.77	-765.59	-198.12	770.11	2.90	2.90	0.00
8,986.00	88.70	178.60	8,430.69	-797.56	-197.28	802.05	2.27	2.19	0.63
9,018.00	88.60	178.40	8,431.44	-829.54	-196.44	834.00	0.70	-0.31	-0.63
9,049.00	88.50	178.50	8,432.23	-860.52	-195.61	864.95	0.46	-0.32	0.32
9,144.00	89.70	179.50	8,433.72	-955.49	-193.95	959.86	1.64	1.26	1.05
9,240.00	89.10	180.50	8,434.73	-1,051.49	-193.95	1,055.82	1.21	-0.63	1.04
9,335.00	90.00	180.90	8,435.47	-1,146.48	-195.11	1,150.81	1.04	0.95	0.42
9,430.00	91.10	180.70	8,434.56	-1,241.46	-196.44	1,245.80	1.18	1.16	-0.21
9,525.00	91.10	181.40	8,432.74	-1,336.43	-198.18	1,340.78	0.74	0.00	0.74
9,620.00	89.10	180.90	8,432.57	-1,431.40	-200.08	1,435.78	2.17	-2.11	-0.53

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9,716.00	90.70	180.60	8,432.74	-1,527.39	-201.34	1,531.77	1.70	1.67	-0.31
9,811.00	90.20	180.10	8,431.99	-1,622.39	-201.92	1,626.75	0.74	-0.53	-0.53
9,906.00	92.00	179.90	8,430.17	-1,717.36	-201.92	1,721.70	1.91	1.89	-0.21
10,001.00	93.30	180.50	8,425.78	-1,812.26	-202.25	1,816.58	1.51	1.37	0.63
10,096.00	92.70	179.90	8,420.80	-1,907.13	-202.58	1,911.43	0.89	-0.63	-0.63
10,191.00	93.20	180.00	8,415.91	-2,002.00	-202.50	2,006.27	0.54	0.53	0.11
10,287.00	90.60	178.50	8,412.73	-2,097.93	-201.24	2,102.14	3.13	-2.71	-1.56
10,382.00	89.80	178.20	8,412.40	-2,192.89	-198.51	2,197.01	0.90	-0.84	-0.32
10,477.00	89.40	178.10	8,413.06	-2,287.84	-195.44	2,291.86	0.43	-0.42	-0.11
10,573.00	90.40	178.80	8,413.23	-2,383.80	-192.84	2,387.73	1.27	1.04	0.73
10,668.00	89.90	178.10	8,412.98	-2,478.76	-190.27	2,482.60	0.91	-0.53	-0.74
10,763.00	91.80	180.00	8,411.57	-2,573.73	-188.70	2,577.51	2.83	2.00	2.00
10,857.00	91.90	180.40	8,408.54	-2,667.68	-189.03	2,671.44	0.44	0.11	0.43
10,953.00	92.40	181.50	8,404.94	-2,763.60	-190.62	2,767.37	1.26	0.52	1.15
11,048.00	92.50	181.70	8,400.88	-2,858.48	-193.27	2,862.28	0.24	0.11	0.21
11,144.00	93.20	181.90	8,396.10	-2,954.31	-196.28	2,958.16	0.76	0.73	0.21
11,239.00	92.30	180.70	8,391.54	-3,049.17	-198.43	3,053.04	1.58	-0.95	-1.26
11,335.00	90.20	180.40	8,389.45	-3,145.14	-199.35	3,149.01	2.21	-2.19	-0.31
11,430.00	89.60	179.70	8,389.62	-3,240.14	-199.43	3,243.98	0.97	-0.63	-0.74
11,526.00	89.40	180.10	8,390.45	-3,336.13	-199.27	3,339.94	0.47	-0.21	0.42
11,620.00	90.50	179.30	8,390.54	-3,430.13	-198.78	3,433.90	1.45	1.17	-0.85
11,715.00	90.60	179.10	8,389.62	-3,525.12	-197.45	3,528.83	0.24	0.11	-0.21
11,810.00	91.90	178.50	8,387.55	-3,620.07	-195.46	3,623.71	1.51	1.37	-0.63
11,905.00	91.50	178.40	8,384.73	-3,714.99	-192.89	3,718.54	0.43	-0.42	-0.11
11,999.00	89.30	177.50	8,384.08	-3,808.92	-189.53	3,812.37	2.53	-2.34	-0.96
12,094.00	90.90	178.60	8,383.91	-3,903.87	-186.30	3,907.20	2.04	1.68	1.16
12,190.00	93.10	179.80	8,380.56	-3,999.79	-184.96	4,003.07	2.61	2.29	1.25
12,285.00	91.90	179.50	8,376.42	-4,094.70	-184.38	4,097.93	1.30	-1.26	-0.32
12,380.00	91.00	179.50	8,374.01	-4,189.66	-183.55	4,192.85	0.95	-0.95	0.00
12,476.00	91.10	179.40	8,372.25	-4,285.64	-182.63	4,288.78	0.15	0.10	-0.10
12,570.00	90.90	179.70	8,370.61	-4,379.62	-181.89	4,382.72	0.38	-0.21	0.32
12,666.00	90.50	179.40	8,369.44	-4,475.61	-181.13	4,478.66	0.52	-0.42	-0.31
12,761.00	92.10	180.50	8,367.29	-4,570.58	-181.05	4,573.61	2.04	1.68	1.16
12,856.00	94.20	182.40	8,362.07	-4,665.40	-183.45	4,668.45	2.98	2.21	2.00
12,951.00	94.30	183.00	8,355.02	-4,760.03	-187.91	4,763.17	0.64	0.11	0.63
13,047.00	91.20	180.30	8,350.42	-4,855.86	-190.67	4,859.03	4.28	-3.23	-2.81
13,141.00	92.50	181.80	8,347.38	-4,949.79	-192.39	4,952.98	2.11	1.38	1.60
13,237.00	90.50	180.60	8,344.87	-5,045.73	-194.40	5,048.94	2.43	-2.08	-1.25
13,331.00	89.70	180.60	8,344.71	-5,139.73	-195.38	5,142.93	0.85	-0.85	0.00
13,426.00	88.20	178.70	8,346.45	-5,234.70	-194.80	5,237.86	2.55	-1.58	-2.00
13,521.00	89.70	179.10	8,348.19	-5,329.66	-192.98	5,332.76	1.63	1.58	0.42
13,617.00	90.30	179.10	8,348.19	-5,425.65	-191.47	5,428.68	0.63	0.63	0.00
13,711.00	90.60	180.00	8,347.45	-5,519.65	-190.74	5,522.63	1.01	0.32	0.96

Company:	Hunt Oil Company	Local Co-ordinate Reference:	Well #2HB
Project:	Upton County, Texas (NAD 27)	TVD Reference:	WELL @ 2613.00usft (Orion 10)
Site:	University 3-36	MD Reference:	WELL @ 2613.00usft (Orion 10)
Well:	#2HB	North Reference:	Grid
Wellbore:	Wellbore #1 Job #1410826	Survey Calculation Method:	Minimum Curvature
Design:	Surveys (Orion 10)	Database:	Compass 5000 GCR DB

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)	
13,806.00	90.60	179.90	8,346.46	-5,614.64	-190.65	5,617.59	0.11	0.00	-0.11	
13,901.00	90.90	180.50	8,345.21	-5,709.63	-190.98	5,712.57	0.71	0.32	0.63	
13,996.00	90.20	180.00	8,344.30	-5,804.63	-191.40	5,807.54	0.91	-0.74	-0.53	
14,092.00	90.00	179.80	8,344.13	-5,900.62	-191.23	5,903.51	0.29	-0.21	-0.21	
14,187.00	91.40	179.50	8,342.97	-5,995.61	-190.65	5,998.46	1.51	1.47	-0.32	
14,282.00	91.10	178.70	8,340.90	-6,090.58	-189.16	6,093.36	0.90	-0.32	-0.84	
14,376.00	90.20	178.40	8,339.83	-6,184.54	-186.78	6,187.24	1.01	-0.96	-0.32	
14,471.00	91.60	179.00	8,338.34	-6,279.50	-184.63	6,282.12	1.60	1.47	0.63	
14,566.00	91.30	179.30	8,335.94	-6,374.46	-183.22	6,377.02	0.45	-0.32	0.32	
14,661.00	88.70	178.20	8,335.94	-6,469.43	-181.14	6,471.91	2.97	-2.74	-1.16	
14,756.00	90.20	179.50	8,336.85	-6,564.40	-179.24	6,566.81	2.09	1.58	1.37	
14,851.00	91.40	180.50	8,335.52	-6,659.39	-179.24	6,661.77	1.64	1.26	1.05	
14,945.00	91.90	179.70	8,332.82	-6,753.35	-179.40	6,755.71	1.00	0.53	-0.85	
15,039.00	88.90	178.60	8,332.16	-6,847.32	-178.01	6,849.62	3.40	-3.19	-1.17	
15,135.00	90.20	178.20	8,332.91	-6,943.28	-175.33	6,945.49	1.42	1.35	-0.42	
15,230.00	90.40	178.80	8,332.42	-7,038.25	-172.84	7,040.37	0.67	0.21	0.63	
15,325.00	91.70	179.10	8,330.68	-7,133.21	-171.10	7,135.26	1.40	1.37	0.32	
15,420.00	92.00	179.80	8,327.61	-7,228.16	-170.19	7,230.16	0.80	0.32	0.74	
15,516.00	91.00	179.70	8,325.10	-7,324.12	-169.77	7,326.09	1.05	-1.04	-0.10	
15,610.00	90.90	179.80	8,323.54	-7,418.11	-169.36	7,420.04	0.15	-0.11	0.11	
15,644.00	91.00	179.50	8,322.97	-7,452.10	-169.15	7,454.02	0.93	0.29	-0.88	
Final Phoenix Survey										
15,707.00	91.00	179.50	8,321.87	-7,515.09	-168.60	7,516.97	0.00	0.00	0.00	
Projection to TD										

Survey Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
4,560.00	4,559.90	3.47	15.28	Gyro Tie-in	
4,701.00	4,700.89	4.23	16.52	First Phoenix Survey	
15,644.00	8,322.97	-7,452.10	-169.15	Final Phoenix Survey	
15,707.00	8,321.87	-7,515.09	-168.60	Projection to TD	

Checked By: _____	Approved By: _____	Date: _____
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