



ConocoPhillips

Lea County, NM

War Hammer 25 Fed Com

W2 2H

Original Hole

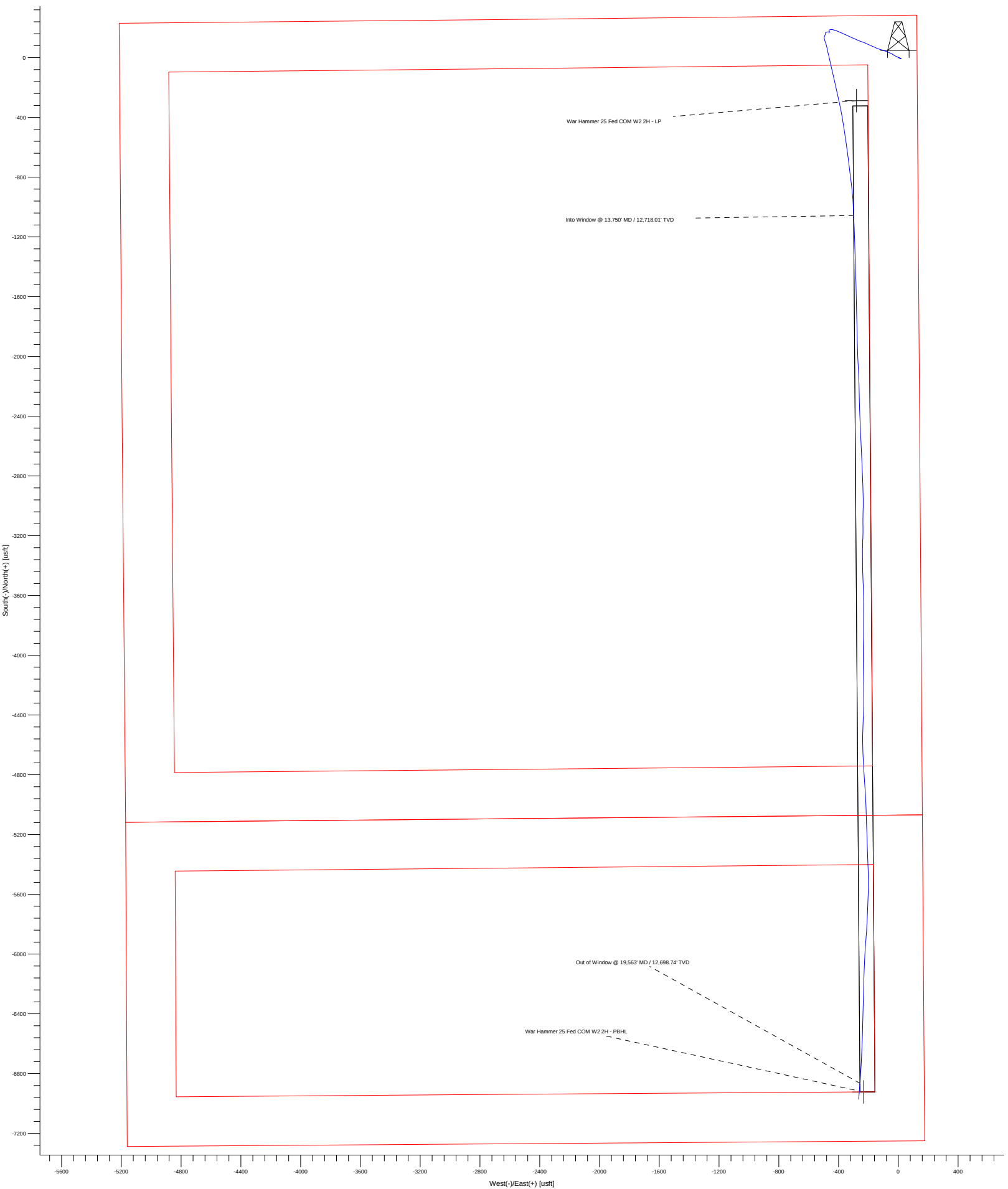
Design: Original Hole

Standard Survey Report

22 June, 2015



Actual: Original Hole (W2 2H/Original Hole)



Company:	ConocoPhillips	Local Co-ordinate Reference:	Well W2 2H
Project:	Lea County, NM	TVD Reference:	Well @ 3166.00usft (H&P 486 RKB: 27' + GL: 3139')
Site:	War Hammer 25 Fed Com	MD Reference:	Well @ 3166.00usft (H&P 486 RKB: 27' + GL: 3139')
Well:	W2 2H	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Original Hole	Database:	Gyrodatta NWDB

Project	Lea County, NM		
Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	New Mexico East 3001		

Site		War Hammer 25 Fed Com			
Site Position:		Northing:	371,782.24 usft	Latitude:	32° 1' 12.49 N
From:	Map	Easting:	721,157.76 usft	Longitude:	103° 37' 11.14 W
Position Uncertainty:	0.00 usft	Slot Radius:	13.20 in	Grid Convergence:	0.38 °

Well	W2 2H					
Well Position	+N/-S	0.00 usft	Northing:	371,749.42 usft	Latitude:	32° 1' 12.17 N
	+E/-W	0.00 usft	Easting:	721,157.99 usft	Longitude:	103° 37' 11.14 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	3,139.00 usft

Wellbore	Original Hole				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	User Defined	5/27/2015	7.28	59.88	48,039

Design	Original Hole				
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	179.57	

Survey Program	Date	6/22/2015			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
134.00	745.00	Survey #1 (Original Hole)	MWD - ISCWSA - COP	MWD - Standard ISCWSA COP	
884.00	19,670.00	Survey #2 (Original Hole)	MWD - ISCWSA - COP	MWD - Standard ISCWSA COP	

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	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	
134.00	0.20	161.40	134.00	-0.22	0.07	0.22	0.15	0.15	0.00	
197.00	0.40	91.70	197.00	-0.33	0.33	0.33	0.60	0.32	-110.63	
258.00	0.60	97.40	258.00	-0.38	0.86	0.39	0.34	0.33	9.34	
320.00	1.00	109.80	319.99	-0.60	1.69	0.62	0.70	0.65	20.00	
405.00	1.00	100.90	404.98	-1.00	3.12	1.02	0.18	0.00	-10.47	
490.00	1.20	117.10	489.96	-1.54	4.64	1.58	0.43	0.24	19.06	
576.00	1.50	115.50	575.94	-2.44	6.45	2.49	0.35	0.35	-1.86	

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Well:	W2 2H	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Original Hole	Database:	Gyrodata NWDB

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
660.00	1.50	109.80	659.91	-3.28	8.48	3.35	0.18	0.00	-6.79
745.00	1.50	122.90	744.88	-4.26	10.46	4.34	0.40	0.00	15.41
790.13	1.45	122.09	790.00	-4.89	11.44	4.97	0.12	-0.11	-1.80
13 3/8"									
884.00	1.35	120.21	883.84	-6.08	13.40	6.18	0.12	-0.11	-2.00
975.00	0.89	110.26	974.82	-6.86	14.99	6.97	0.55	-0.51	-10.93
1,066.00	0.74	104.24	1,065.81	-7.25	16.23	7.37	0.19	-0.16	-6.62
1,156.00	0.50	112.86	1,155.81	-7.54	17.15	7.67	0.29	-0.27	9.58
1,249.00	0.51	104.67	1,248.80	-7.81	17.93	7.94	0.08	0.01	-8.81
1,343.00	0.50	106.29	1,342.80	-8.03	18.72	8.17	0.02	-0.01	1.72
1,438.00	0.16	294.65	1,437.80	-8.09	19.00	8.23	0.69	-0.36	-180.67
1,532.00	0.56	304.90	1,531.80	-7.77	18.51	7.91	0.43	0.43	10.90
1,626.00	0.51	296.31	1,625.79	-7.32	17.75	7.46	0.10	-0.05	-9.14
1,721.00	0.75	293.44	1,720.79	-6.89	16.80	7.01	0.25	0.25	-3.02
1,815.00	0.89	292.26	1,814.78	-6.37	15.56	6.48	0.15	0.15	-1.26
1,909.00	0.81	297.03	1,908.77	-5.79	14.30	5.90	0.11	-0.09	5.07
2,003.00	0.84	301.25	2,002.76	-5.13	13.12	5.23	0.07	0.03	4.49
2,097.00	0.92	295.72	2,096.74	-4.44	11.85	4.53	0.12	0.09	-5.88
2,192.00	0.99	293.81	2,191.73	-3.78	10.41	3.86	0.08	0.07	-2.01
2,286.00	1.07	289.68	2,285.72	-3.16	8.84	3.23	0.12	0.09	-4.39
2,380.00	0.99	286.23	2,379.70	-2.64	7.23	2.69	0.11	-0.09	-3.67
2,475.00	0.95	289.21	2,474.69	-2.15	5.70	2.19	0.07	-0.04	3.14
2,569.00	1.02	293.73	2,568.67	-1.55	4.20	1.59	0.11	0.07	4.81
2,663.00	0.97	299.30	2,662.66	-0.83	2.74	0.85	0.12	-0.05	5.93
2,758.00	0.95	306.86	2,757.65	0.04	1.41	-0.03	0.13	-0.02	7.96
2,852.00	0.91	300.25	2,851.63	0.88	0.14	-0.88	0.12	-0.04	-7.03
2,946.00	0.85	289.78	2,945.62	1.49	-1.16	-1.50	0.18	-0.06	-11.14
3,041.00	1.60	302.21	3,040.60	2.44	-2.95	-2.46	0.83	0.79	13.08
3,135.00	2.86	295.13	3,134.53	4.13	-6.18	-4.18	1.37	1.34	-7.53
3,229.00	4.19	292.75	3,228.35	6.46	-11.47	-6.54	1.42	1.41	-2.53
3,324.00	4.19	298.15	3,323.09	9.44	-17.73	-9.57	0.42	0.00	5.68
3,418.00	4.76	298.56	3,416.81	12.92	-24.18	-13.10	0.61	0.61	0.44
3,513.00	4.63	301.86	3,511.49	16.83	-30.90	-17.06	0.32	-0.14	3.47
3,607.00	4.33	307.86	3,605.20	21.01	-36.93	-21.29	0.59	-0.32	6.38
3,701.00	5.37	297.00	3,698.87	25.19	-43.65	-25.51	1.47	1.11	-11.55
3,796.00	5.57	292.88	3,793.43	29.00	-51.86	-29.38	0.46	0.21	-4.34
3,890.00	5.07	294.55	3,887.03	32.50	-59.84	-32.94	0.56	-0.53	1.78
3,984.00	5.08	292.17	3,980.66	35.79	-67.47	-36.30	0.22	0.01	-2.53
4,078.00	4.25	289.68	4,074.35	38.54	-74.60	-39.09	0.91	-0.88	-2.65
4,173.00	3.53	291.00	4,169.13	40.77	-80.65	-41.37	0.76	-0.76	1.39
4,267.00	4.09	290.26	4,262.92	42.97	-86.49	-43.61	0.60	0.60	-0.79
4,361.00	5.23	289.46	4,356.61	45.56	-93.68	-46.26	1.21	1.21	-0.85

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Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
4,456.00	5.80	289.06	4,451.17	48.57	-102.30	-49.33	0.60	0.60	-0.42	
4,550.00	5.43	286.57	4,544.72	51.38	-111.05	-52.22	0.47	-0.39	-2.65	
4,644.00	5.07	285.31	4,638.32	53.75	-119.32	-54.64	0.40	-0.38	-1.34	
4,725.00	4.41	286.15	4,719.04	55.56	-125.76	-56.50	0.82	-0.81	1.04	
4,790.15	4.54	287.46	4,784.00	57.03	-130.63	-58.01	0.26	0.21	2.01	
9 5/8"										
4,855.00	4.68	288.69	4,848.64	58.65	-135.59	-59.67	0.26	0.21	1.90	
4,949.00	4.82	293.78	4,942.31	61.47	-142.83	-62.54	0.47	0.15	5.41	
5,044.00	5.61	296.01	5,036.92	65.12	-150.66	-66.25	0.86	0.83	2.35	
5,138.00	5.38	297.26	5,130.49	69.15	-158.71	-70.34	0.28	-0.24	1.33	
5,232.00	5.55	292.12	5,224.06	72.88	-166.83	-74.13	0.55	0.18	-5.47	
5,327.00	5.53	289.17	5,318.62	76.11	-175.41	-77.43	0.30	-0.02	-3.11	
5,421.00	6.34	294.60	5,412.11	79.76	-184.41	-81.14	1.05	0.86	5.78	
5,516.00	6.53	295.53	5,506.52	84.27	-194.05	-85.73	0.23	0.20	0.98	
5,610.00	6.15	294.73	5,599.94	88.68	-203.45	-90.21	0.42	-0.40	-0.85	
5,704.00	5.62	295.24	5,693.44	92.75	-212.19	-94.34	0.57	-0.56	0.54	
5,798.00	5.41	293.13	5,787.01	96.46	-220.43	-98.11	0.31	-0.22	-2.24	
5,893.00	5.92	290.13	5,881.55	99.90	-229.14	-101.62	0.62	0.54	-3.16	
5,987.00	6.18	291.21	5,975.02	103.40	-238.41	-105.19	0.30	0.28	1.15	
6,082.00	6.17	290.39	6,069.47	107.03	-247.97	-108.89	0.09	-0.01	-0.86	
6,176.00	5.83	291.36	6,162.96	110.53	-257.15	-112.45	0.38	-0.36	1.03	
6,271.00	6.47	289.49	6,257.41	114.07	-266.69	-116.07	0.71	0.67	-1.97	
6,365.00	6.46	296.07	6,350.81	118.16	-276.43	-120.23	0.79	-0.01	7.00	
6,459.00	6.16	293.94	6,444.24	122.53	-285.79	-124.67	0.40	-0.32	-2.27	
6,553.00	5.61	292.80	6,537.75	126.36	-294.63	-128.57	0.60	-0.59	-1.21	
6,648.00	5.66	292.80	6,632.29	129.97	-303.23	-132.25	0.05	0.05	0.00	
6,742.00	5.17	292.38	6,725.87	133.38	-311.42	-135.72	0.52	-0.52	-0.45	
6,836.00	5.26	297.41	6,819.48	136.98	-319.16	-139.37	0.50	0.10	5.35	
6,931.00	5.01	294.68	6,914.10	140.72	-326.80	-143.16	0.37	-0.26	-2.87	
7,025.00	5.38	294.16	7,007.71	144.23	-334.55	-146.74	0.40	0.39	-0.55	
7,120.00	6.00	295.60	7,102.24	148.20	-343.09	-150.77	0.67	0.65	1.52	
7,214.00	5.95	294.39	7,195.73	152.34	-351.96	-154.97	0.14	-0.05	-1.29	
7,309.00	5.17	292.00	7,290.29	155.97	-360.41	-158.67	0.86	-0.82	-2.52	
7,403.00	4.75	291.62	7,383.93	158.99	-367.96	-161.75	0.45	-0.45	-0.40	
7,498.00	5.78	296.66	7,478.53	162.59	-375.89	-165.41	1.19	1.08	5.31	
7,592.00	5.47	293.70	7,572.08	166.51	-384.22	-169.39	0.45	-0.33	-3.15	
7,686.00	4.82	294.36	7,665.70	169.94	-391.92	-172.88	0.69	-0.69	0.70	
7,780.00	4.08	293.54	7,759.42	172.91	-398.58	-175.89	0.79	-0.79	-0.87	
7,874.00	3.68	290.75	7,853.20	175.31	-404.47	-178.34	0.47	-0.43	-2.97	
7,969.00	3.32	289.97	7,948.02	177.33	-409.91	-180.40	0.38	-0.38	-0.82	
8,063.00	2.62	287.37	8,041.90	178.90	-414.52	-182.01	0.76	-0.74	-2.77	
8,158.00	2.78	287.49	8,136.79	180.24	-418.79	-183.38	0.17	0.17	0.13	

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Survey										
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8,243.00	2.27	286.38	8,221.71	181.34	-422.37	-184.50	0.60	-0.60	-1.31	
8,341.00	2.17	283.06	8,319.63	182.30	-426.04	-185.50	0.17	-0.10	-3.39	
8,435.00	1.85	288.26	8,413.58	183.18	-429.21	-186.40	0.39	-0.34	5.53	
8,530.00	1.60	298.47	8,508.53	184.29	-431.83	-187.53	0.42	-0.26	10.75	
8,624.00	1.41	294.22	8,602.50	185.39	-434.04	-188.65	0.23	-0.20	-4.52	
8,719.00	1.27	288.43	8,697.47	186.21	-436.11	-189.47	0.20	-0.15	-6.09	
8,813.00	1.06	275.20	8,791.46	186.62	-437.96	-189.90	0.36	-0.22	-14.07	
8,908.00	0.93	272.11	8,886.44	186.72	-439.61	-190.02	0.15	-0.14	-3.25	
9,002.00	1.05	274.22	8,980.43	186.81	-441.23	-190.12	0.13	0.13	2.24	
9,096.00	1.38	277.28	9,074.41	187.02	-443.21	-190.34	0.36	0.35	3.26	
9,191.00	1.56	279.51	9,169.37	187.38	-445.62	-190.72	0.20	0.19	2.35	
9,285.00	2.58	267.00	9,263.31	187.48	-448.99	-190.85	1.18	1.09	-13.31	
9,380.00	2.01	265.56	9,358.24	187.24	-452.79	-190.63	0.60	-0.60	-1.52	
9,474.00	1.29	263.84	9,452.20	187.00	-455.49	-190.41	0.77	-0.77	-1.83	
9,568.00	1.93	256.67	9,546.16	186.52	-458.08	-189.95	0.71	0.68	-7.63	
9,662.00	1.92	243.11	9,640.11	185.44	-461.02	-188.90	0.48	-0.01	-14.43	
9,757.00	1.80	210.48	9,735.06	183.44	-463.20	-186.91	1.11	-0.13	-34.35	
9,850.00	2.69	189.75	9,827.99	180.03	-464.31	-183.51	1.28	0.96	-22.29	
9,944.00	2.00	148.72	9,921.91	176.45	-463.83	-179.93	1.88	-0.73	-43.65	
10,039.00	1.31	131.43	10,016.88	174.32	-462.16	-177.78	0.89	-0.73	-18.20	
10,133.00	1.07	132.84	10,110.85	173.01	-460.71	-176.46	0.26	-0.26	1.50	
10,228.00	1.12	133.96	10,205.84	171.76	-459.39	-175.20	0.06	0.05	1.18	
10,322.00	0.55	101.50	10,299.83	171.03	-458.28	-174.47	0.77	-0.61	-34.53	
10,416.00	0.20	121.92	10,393.83	170.86	-457.70	-174.29	0.39	-0.37	21.72	
10,511.00	0.66	234.56	10,488.82	170.45	-458.01	-173.88	0.80	0.48	118.57	
10,605.00	0.87	235.47	10,582.82	169.73	-459.04	-173.17	0.22	0.22	0.97	
10,699.00	1.81	278.92	10,676.79	169.56	-461.09	-173.01	1.41	1.00	46.22	
10,794.00	2.90	282.44	10,771.71	170.31	-464.92	-173.79	1.16	1.15	3.71	
10,888.00	3.62	281.69	10,865.56	171.42	-470.15	-174.95	0.77	0.77	-0.80	
10,982.00	2.80	260.29	10,959.41	171.64	-475.32	-175.20	1.53	-0.87	-22.77	
11,077.00	3.25	242.21	11,054.28	169.99	-479.99	-173.59	1.10	0.47	-19.03	
11,171.00	1.88	255.00	11,148.18	168.35	-483.83	-171.97	1.57	-1.46	13.61	
11,265.00	1.51	235.70	11,242.14	167.25	-486.35	-170.90	0.72	-0.39	-20.53	
11,360.00	1.44	203.15	11,337.11	165.45	-487.85	-169.10	0.87	-0.07	-34.26	
11,454.00	1.73	191.48	11,431.08	162.97	-488.60	-166.63	0.46	0.31	-12.41	
11,548.00	1.80	185.84	11,525.03	160.11	-489.03	-163.78	0.20	0.07	-6.00	
11,643.00	1.49	184.51	11,620.00	157.40	-489.28	-161.06	0.33	-0.33	-1.40	
11,737.00	1.73	197.41	11,713.96	154.82	-489.80	-158.50	0.46	0.26	13.72	
11,831.00	1.75	198.79	11,807.91	152.11	-490.69	-155.79	0.05	0.02	1.47	
11,926.00	1.73	200.45	11,902.87	149.40	-491.65	-153.08	0.06	-0.02	1.75	
12,020.00	1.74	200.46	11,996.83	146.73	-492.65	-150.42	0.01	0.01	0.01	
12,114.00	1.74	202.27	12,090.78	144.07	-493.69	-147.77	0.06	0.00	1.93	

Company:	ConocoPhillips	Local Co-ordinate Reference:	Well W2 2H
Project:	Lea County, NM	TVD Reference:	Well @ 3166.00usft (H&P 486 RKB: 27' + GL: 3139')
Site:	War Hammer 25 Fed Com	MD Reference:	Well @ 3166.00usft (H&P 486 RKB: 27' + GL: 3139')
Well:	W2 2H	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Original Hole	Database:	Gyrodata NWDB

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
12,150.00	1.85	202.73	12,126.77	143.03	-494.12	-146.73	0.31	0.31	1.28	
12,198.26	1.95	205.58	12,175.00	141.57	-494.78	-145.28	0.28	0.20	5.91	
7 5/8"										
12,266.00	2.09	209.13	12,242.70	139.45	-495.87	-143.17	0.28	0.21	5.24	
12,355.00	10.02	175.91	12,331.15	130.30	-496.11	-134.02	9.38	8.91	-37.33	
12,387.00	12.12	170.81	12,362.55	124.20	-495.38	-127.92	7.23	6.56	-15.94	
12,415.00	13.25	167.74	12,389.87	118.17	-494.23	-121.87	4.70	4.04	-10.96	
12,447.00	17.85	159.82	12,420.69	109.97	-491.75	-113.66	15.80	14.37	-24.75	
12,478.00	24.46	157.95	12,449.59	99.55	-487.70	-103.21	21.43	21.32	-6.03	
12,510.00	30.28	164.09	12,478.00	85.64	-483.00	-89.26	20.19	18.19	19.19	
12,542.00	34.17	168.50	12,505.07	69.07	-478.99	-72.66	14.20	12.16	13.78	
12,568.00	38.70	167.75	12,525.98	53.96	-475.81	-57.53	17.51	17.42	-2.88	
12,599.00	44.37	165.87	12,549.18	33.96	-471.10	-37.50	18.73	18.29	-6.06	
12,631.00	47.88	167.28	12,571.35	11.53	-465.76	-15.02	11.42	10.97	4.41	
12,663.00	52.01	167.29	12,591.94	-12.36	-460.37	8.90	12.91	12.91	0.03	
12,694.00	55.83	168.00	12,610.19	-36.83	-455.01	33.41	12.46	12.32	2.29	
12,726.00	59.50	167.07	12,627.31	-63.22	-449.17	59.85	11.73	11.47	-2.91	
12,758.00	62.68	166.83	12,642.77	-90.51	-442.85	87.18	9.96	9.94	-0.75	
12,789.00	65.06	166.88	12,656.43	-117.61	-436.52	114.33	7.68	7.68	0.16	
12,821.00	66.60	166.86	12,669.53	-146.04	-429.89	142.81	4.81	4.81	-0.06	
12,853.00	67.74	167.20	12,681.94	-174.78	-423.27	171.60	3.69	3.56	1.06	
12,884.00	69.82	167.78	12,693.16	-202.99	-417.01	199.86	6.93	6.71	1.87	
12,916.00	74.98	167.63	12,702.84	-232.78	-410.52	229.70	16.13	16.12	-0.47	
12,951.00	80.40	167.31	12,710.29	-266.15	-403.10	263.12	15.51	15.49	-0.91	
12,982.00	83.28	167.99	12,714.69	-296.12	-396.54	293.14	9.54	9.29	2.19	
13,014.00	86.09	169.00	12,717.66	-327.34	-390.18	324.41	9.33	8.78	3.16	
13,078.00	87.66	169.43	12,721.15	-390.12	-378.23	387.27	2.54	2.45	0.67	
13,172.00	89.09	171.60	12,723.81	-482.79	-362.74	480.05	2.76	1.52	2.31	
13,267.00	89.37	171.74	12,725.09	-576.78	-348.98	574.14	0.33	0.29	0.15	
13,362.00	91.75	172.97	12,724.16	-670.92	-336.34	668.38	2.82	2.51	1.29	
13,457.00	91.47	172.93	12,721.49	-765.16	-324.69	762.70	0.30	-0.29	-0.04	
13,552.00	89.62	173.31	12,720.59	-859.47	-313.31	857.09	1.99	-1.95	0.40	
13,646.00	91.33	175.91	12,719.81	-953.04	-304.48	950.73	3.31	1.82	2.77	
13,741.00	90.71	178.09	12,718.12	-1,047.89	-299.51	1,045.61	2.39	-0.65	2.29	
13,836.00	90.46	176.88	12,717.15	-1,142.79	-295.34	1,140.54	1.30	-0.26	-1.27	
13,931.00	92.28	179.18	12,714.88	-1,237.70	-292.08	1,235.47	3.09	1.92	2.42	
14,026.00	89.12	177.89	12,713.72	-1,332.64	-289.65	1,330.43	3.59	-3.33	-1.36	
14,121.00	88.22	178.04	12,715.92	-1,427.56	-286.28	1,425.37	0.96	-0.95	0.16	
14,216.00	88.28	178.77	12,718.82	-1,522.48	-283.63	1,520.30	0.77	0.06	0.77	
14,310.00	89.53	179.16	12,720.62	-1,616.44	-281.94	1,614.28	1.39	1.33	0.41	
14,405.00	90.29	178.19	12,720.77	-1,711.41	-279.74	1,709.27	1.30	0.80	-1.02	
14,500.00	89.73	178.15	12,720.75	-1,806.37	-276.71	1,804.24	0.59	-0.59	-0.04	

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Site:	War Hammer 25 Fed Com	MD Reference:	Well @ 3166.00usft (H&P 486 RKB: 27' + GL: 3139')
Well:	W2 2H	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Original Hole	Database:	Gyrodata NWDB

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
14,595.00	90.24	179.11	12,720.78	-1,901.34	-274.43	1,899.22	1.14	0.54	1.01	
14,690.00	91.22	177.80	12,719.57	-1,996.29	-271.87	1,994.19	1.72	1.03	-1.38	
14,785.00	89.90	176.87	12,718.64	-2,091.18	-267.46	2,089.11	1.70	-1.39	-0.98	
14,879.00	90.80	178.62	12,718.06	-2,185.10	-263.76	2,183.06	2.09	0.96	1.86	
14,974.00	90.18	179.56	12,717.25	-2,280.08	-262.25	2,278.05	1.19	-0.65	0.99	
15,069.00	90.04	177.54	12,717.07	-2,375.05	-259.85	2,373.03	2.13	-0.15	-2.13	
15,164.00	91.11	177.21	12,716.11	-2,469.94	-255.49	2,467.96	1.18	1.13	-0.35	
15,259.00	90.24	176.04	12,715.00	-2,564.77	-249.90	2,562.82	1.53	-0.92	-1.23	
15,354.00	89.73	178.82	12,715.02	-2,659.66	-245.64	2,657.75	2.98	-0.54	2.93	
15,449.00	90.74	177.91	12,714.63	-2,754.62	-242.93	2,752.72	1.43	1.06	-0.96	
15,543.00	90.66	177.25	12,713.48	-2,848.53	-238.96	2,846.66	0.71	-0.09	-0.70	
15,638.00	90.58	178.92	12,712.45	-2,943.47	-235.79	2,941.62	1.76	-0.08	1.76	
15,733.00	90.24	182.07	12,711.77	-3,038.45	-236.61	3,036.59	3.33	-0.36	3.32	
15,828.00	90.85	179.00	12,710.87	-3,133.43	-237.50	3,131.56	3.29	0.64	-3.23	
15,923.00	91.19	182.07	12,709.18	-3,228.40	-238.38	3,226.52	3.25	0.36	3.23	
16,018.00	90.49	180.24	12,707.79	-3,323.37	-240.30	3,321.47	2.06	-0.74	-1.93	
16,113.00	90.07	179.05	12,707.32	-3,418.36	-239.71	3,416.47	1.33	-0.44	-1.25	
16,208.00	89.15	176.87	12,707.97	-3,513.29	-236.33	3,511.42	2.49	-0.97	-2.29	
16,302.00	90.69	179.34	12,708.10	-3,607.23	-233.22	3,605.38	3.10	1.64	2.63	
16,397.00	91.16	180.27	12,706.57	-3,702.22	-232.90	3,700.36	1.10	0.49	0.98	
16,492.00	91.72	179.71	12,704.18	-3,797.19	-232.88	3,795.33	0.83	0.59	-0.59	
16,587.00	91.39	181.06	12,701.60	-3,892.15	-233.52	3,890.28	1.46	-0.35	1.42	
16,682.00	90.85	181.72	12,699.74	-3,987.10	-235.82	3,985.22	0.90	-0.57	0.69	
16,776.00	90.55	177.60	12,698.59	-4,081.07	-235.27	4,079.19	4.39	-0.32	-4.38	
16,871.00	89.68	178.27	12,698.40	-4,176.01	-231.84	4,174.15	1.16	-0.92	0.71	
16,966.00	90.77	180.70	12,698.03	-4,270.99	-230.99	4,269.14	2.80	1.15	2.56	
17,061.00	90.38	181.63	12,697.08	-4,365.97	-232.92	4,364.10	1.06	-0.41	0.98	
17,156.00	90.07	182.71	12,696.70	-4,460.90	-236.52	4,459.00	1.18	-0.33	1.14	
17,250.00	89.17	180.80	12,697.33	-4,554.85	-239.40	4,552.92	2.25	-0.96	-2.03	
17,345.00	90.43	177.31	12,697.66	-4,649.82	-237.83	4,647.90	3.91	1.33	-3.67	
17,440.00	91.97	176.70	12,695.67	-4,744.66	-232.87	4,742.78	1.74	1.62	-0.64	
17,535.00	90.80	176.20	12,693.37	-4,839.45	-226.99	4,837.61	1.34	-1.23	-0.53	
17,630.00	89.73	176.13	12,692.93	-4,934.23	-220.63	4,932.44	1.13	-1.13	-0.07	
17,724.00	90.41	179.01	12,692.82	-5,028.14	-216.65	5,026.37	3.15	0.72	3.06	
17,819.00	89.68	177.59	12,692.75	-5,123.09	-213.83	5,121.35	1.68	-0.77	-1.49	
17,914.00	90.66	178.03	12,692.46	-5,218.02	-210.20	5,216.30	1.13	1.03	0.46	
18,008.00	90.38	177.37	12,691.61	-5,311.94	-206.43	5,310.24	0.76	-0.30	-0.70	
18,102.00	88.56	178.75	12,692.48	-5,405.88	-203.24	5,404.20	2.43	-1.94	1.47	
18,197.00	91.55	178.99	12,692.39	-5,500.85	-201.37	5,499.18	3.16	3.15	0.25	
18,292.00	91.08	181.85	12,690.21	-5,595.81	-202.07	5,594.14	3.05	-0.49	3.01	
18,387.00	90.43	182.49	12,688.96	-5,690.73	-205.66	5,689.03	0.96	-0.68	0.67	
18,482.00	89.17	182.33	12,689.29	-5,785.65	-209.66	5,783.91	1.34	-1.33	-0.17	

Company:	ConocoPhillips	Local Co-ordinate Reference:	Well W2 2H
Project:	Lea County, NM	TVD Reference:	Well @ 3166.00usft (H&P 486 RKB: 27' + GL: 3139')
Site:	War Hammer 25 Fed Com	MD Reference:	Well @ 3166.00usft (H&P 486 RKB: 27' + GL: 3139')
Well:	W2 2H	North Reference:	Grid
Wellbore:	Original Hole	Survey Calculation Method:	Minimum Curvature
Design:	Original Hole	Database:	Gyrodata NWDB

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
18,577.00	91.02	184.87	12,689.13	-5,880.45	-215.62	5,878.66	3.31	1.95	2.67	
18,671.00	90.38	183.40	12,687.98	-5,974.19	-222.40	5,972.36	1.71	-0.68	-1.56	
18,766.00	88.03	182.42	12,689.30	-6,069.05	-227.22	6,067.18	2.68	-2.47	-1.03	
18,861.00	89.29	181.63	12,691.52	-6,163.97	-230.58	6,162.06	1.57	1.33	-0.83	
18,956.00	88.05	181.46	12,693.73	-6,258.90	-233.14	6,256.98	1.32	-1.31	-0.18	
19,051.00	87.49	181.88	12,697.42	-6,353.79	-235.91	6,351.84	0.74	-0.59	0.44	
19,146.00	88.50	181.50	12,700.75	-6,448.69	-238.71	6,446.72	1.14	1.06	-0.40	
19,241.00	90.18	181.83	12,701.84	-6,543.64	-241.47	6,541.64	1.80	1.77	0.35	
19,336.00	90.52	181.28	12,701.26	-6,638.60	-244.04	6,636.59	0.68	0.36	-0.58	
19,431.00	90.85	184.03	12,700.12	-6,733.49	-248.44	6,731.43	2.92	0.35	2.89	
19,526.00	90.49	183.80	12,699.01	-6,828.26	-254.93	6,826.15	0.45	-0.38	-0.24	
19,610.00	90.21	184.46	12,698.50	-6,912.04	-260.98	6,909.88	0.85	-0.33	0.79	
19,670.00	90.21	184.46	12,698.28	-6,971.86	-265.64	6,969.67	0.00	0.00	0.00	

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (in)	Hole Diameter (in)	
	12,804.00	5"	5.50	6.00	
790.13	790.00	13 3/8"	13.37	17.50	
4,790.15	4,784.00	9 5/8"	9.62	12.25	
12,198.26	12,175.00	7 5/8"	5.50	6.00	

Checked By: _____	Approved By: _____	Date: _____
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