



United States Department of the Interior ²⁹

Energy Services

BUREAU OF LAND MANAGEMENT

Pecos District
Roswell Field Office
2909 West Second Street
Roswell, New Mexico 88201-2019
www.blm.gov/nm/st/en.html



TAKE PRIDE IN AMERICA

817.568.1499 (fax)
www.msenergyservices.com

State of Texas

County of Tarrant

HOBBS OCD

SEP 19 2017

RECEIVED

I, NESBY CAIN, certify that; I am employed by MS Energy Services; that I did on the day(s) of 9/30/15 through 11/4/15 conduct or supervise the taking of MWD survey(s) from a depth of 887 feet to a depth of 19,969 feet; that the data is true, correct, complete and within the limitations of the tool set forth by MS Energy Services; that I am authorized and qualified to make this report; that this survey(s) was / were conducted at the request of CONOCO PHILLIPS COMPANY for the WAR HAMMER 25 FEDERAL ^{COM W314}, API No. 30.025.42029 in LEA ^(County) Parish, NEW MEXICO; and that I have reviewed this report and find that it conforms to the principles and procedures as set forth by MS Energy Services.

Signature: [Signature]
Title: MWD FIELD SPECIALIST



Company:	ConocoPhillips Company		
Well Name:	War Hammer 25 Federal COM W3 1H		
Location:	Lea County, NM		
Rig:	H&P #486	Magnetic Declination:	6.79
Job Number:	DDMO-150568		
API #:	30-025-42029		

Vertical Section Azimuth:	179.64	Proposed Direction:	179.64
---------------------------	--------	---------------------	--------

Survey Calculation Method:	Minimum Curvature
----------------------------	-------------------

PTB:	MD	INC	AZM	TVD	N/S	E/W	VS
	20,027	92	181.1	13145.21	-7005.25	-208.53	7003.81

#	Depth Feet	Inc Degrees	Azm Degrees	TVD Feet	N/S Feet	E/W Feet	Surface Vert Sec	Closure Distance	Azm	DLS/100	BUR/100
TIE IN	733	1.00	119.70	732.92	-2.78	9.14	2.84	9.55	106.92		
1	887	0.40	122.90	886.91	-3.74	10.76	3.81	11.39	109.16	0.39	-0.00
2	979	1.50	357.50	978.90	-2.71	10.98	2.78	11.31	103.87	1.92	1.00
3	1,071	3.00	354.20	1070.82	0.89	10.68	-0.82	10.72	85.24	1.64	1.00
4	1,163	2.50	354.70	1162.72	5.28	10.25	-5.22	11.53	62.74	0.54	-0.00
5	1,254	2.60	349.30	1253.63	9.29	9.68	-9.23	13.42	46.20	0.00	0.00
6	1,349	2.50	346.80	1348.53	13.42	8.81	-13.37	16.06	33.29	0.00	0.00
7	1,443	2.30	347.20	1442.45	17.26	7.93	-17.21	18.99	24.67	0.00	0.00
8	1,538	2.30	339.90	1537.38	20.91	6.85	-20.86	22.00	18.14	0.00	0.00
9	1,633	2.10	341.10	1632.31	24.34	5.63	-24.31	24.98	13.02	0.00	0.00
10	1,727	1.80	336.80	1726.25	27.33	4.49	-27.30	27.69	9.33	0.00	0.00
11	1,822	1.80	334.70	1821.20	30.05	3.26	-30.03	30.23	6.20	0.00	0.00
12	1,917	1.60	339.00	1916.16	32.64	2.15	-32.62	32.71	3.77	0.00	0.00
13	2,011	1.50	336.00	2010.13	34.99	1.18	-34.98	35.00	1.93	0.14	-0.00
14	2,106	1.50	334.70	2105.10	37.25	0.14	-37.24	37.25	0.22	0.04	0.00
15	2,201	2.00	310.90	2200.05	39.45	-1.64	-39.46	39.49	357.62	0.92	0.00
16	2,295	2.20	306.10	2293.99	41.59	-4.34	-41.62	41.82	354.05	0.28	0.00
17	2,389	3.60	293.00	2387.87	43.81	-8.51	-43.86	44.63	349.00	1.64	1.00
18	2,484	5.80	293.60	2482.54	46.90	-15.66	-46.99	49.44	341.54	2.32	2.00
19	2,578	6.50	296.70	2576.00	51.19	-24.76	-51.34	56.86	334.18	0.82	0.00
20	2,672	6.10	296.00	2669.43	55.77	-34.01	-55.98	65.32	328.63	0.43	-0.00
21	2,766	5.90	298.30	2762.92	60.25	-42.75	-60.51	73.87	324.64	0.33	-0.21
22	2,860	5.70	299.40	2856.44	64.83	-51.07	-65.15	82.53	321.77	0.24	-0.21
23	2,955	5.30	296.50	2951.00	69.10	-59.11	-69.47	90.93	319.46	0.51	-0.42
24	3,049	5.30	298.10	3044.60	73.09	-66.82	-73.50	99.03	317.56	0.16	0.00
25	3,144	5.10	299.60	3139.21	77.24	-74.36	-77.70	107.22	316.09	0.25	-0.00
26	3,238	4.60	301.20	3232.87	81.25	-81.22	-81.76	114.89	315.01	0.55	0.00
27	3,332	4.70	308.10	3326.56	85.58	-87.47	-86.13	122.38	314.37	0.60	0.00
28	3,426	4.40	311.90	3420.26	90.37	-93.19	-90.95	129.81	314.12	0.45	0.00
29	3,520	4.20	317.30	3514.00	95.30	-98.21	-95.92	136.85	314.14	0.48	-0.00
30	3,615	3.90	321.70	3608.76	100.40	-102.57	-101.04	143.53	314.39	0.45	-0.32
31	3,709	4.70	310.90	3702.50	105.43	-107.46	-106.10	150.54	314.45	1.21	0.85

United States Department of the Interior
 Bureau of Land Management
 Pecos District
 Roswell Field Office
 2900 West Second Street
 Roswell, New Mexico 88201-2019
www.blm.gov/nm/s/en.html

TAKE PRIDE IN AMERICA



Company:	ConocoPhillips Company		
Well Name:	War Hammer 25 Federal COM W3 1H		
Location:	Lea County, NM		
Rig:	H&P #486	Magnetic Declination:	6.79
Job Number:	DDMO-150568		
API #:	30-025-42029		

Vertical Section Azimuth:	179.64	Proposed Direction:	179.64
---------------------------	--------	---------------------	--------

Survey Calculation Method:	Minimum Curvature
----------------------------	-------------------

PTB:	MD	INC	AZM	TVD	N/S	E/W	VS
	20,027	92	181.1	13145.21	-7005.25	-208.53	7003.81

#	Depth Feet	Inc Degrees	Azm Degrees	TVD Feet	N/S Feet	E/W Feet	Surface Vert Sec	Closure Distance	Closure Azm	DLS/100	BU/100
32	3,803	5.10	308.60	3796.16	110.56	-113.64	-111.27	158.54	314.21	0.47	0.47
33	3,896	4.70	311.00	3888.82	115.63	-119.74	-116.38	166.46	314.00	0.48	-0.01
34	3,990	4.50	310.70	3982.51	120.57	-125.45	-121.35	173.99	313.86	0.21	-0.01
35	4,085	4.20	307.60	4077.24	125.12	-131.03	-125.94	181.17	313.68	0.40	-0.01
36	4,179	4.30	305.20	4170.98	129.25	-136.63	-130.11	188.08	313.41	0.22	0.00
37	4,274	4.30	296.90	4265.71	132.91	-142.72	-133.81	195.03	312.96	0.55	-0.01
38	4,368	4.10	290.90	4359.46	135.71	-149.00	-136.64	201.54	312.33	0.25	-0.01
39	4,463	3.80	291.80	4454.24	138.09	-155.10	-139.06	207.66	311.68	0.25	-0.01
40	4,535	4.10	290.30	4526.07	139.87	-159.73	-140.87	212.31	311.21	0.25	-0.01
41	4,658	4.80	298.60	4648.70	143.86	-168.37	-144.91	221.46	310.51	0.25	-0.01
42	4,753	5.10	293.40	4743.34	147.44	-175.73	-148.54	229.39	310.00	0.25	-0.01
43	4,847	5.30	291.60	4836.95	150.69	-183.61	-151.84	237.53	309.38	0.25	-0.01
44	4,941	4.80	289.80	4930.59	153.62	-191.34	-154.82	245.38	308.76	0.12	-0.01
45	5,035	4.90	289.10	5024.25	156.27	-198.84	-157.52	252.90	308.16	0.12	-0.01
46	5,129	5.20	290.10	5117.89	159.05	-206.63	-160.34	260.75	307.59	0.33	-0.01
47	5,224	4.40	286.50	5212.55	161.56	-214.17	-162.90	268.27	307.03	0.90	-0.01
48	5,318	4.40	287.30	5306.28	163.66	-221.07	-165.04	275.05	306.51	0.07	0.00
49	5,412	4.70	288.10	5399.98	165.93	-228.17	-167.36	282.12	306.02	0.33	-0.01
50	5,506	4.30	286.10	5493.69	168.10	-235.22	-169.57	289.11	305.55	0.46	-0.01
51	5,601	4.00	285.90	5588.44	170.00	-241.83	-171.51	295.60	305.11	0.32	-0.01
52	5,695	3.60	284.40	5682.24	171.63	-247.84	-173.18	301.46	304.70	0.44	-0.01
53	5,790	3.30	283.60	5777.06	173.01	-253.38	-174.60	306.82	304.33	0.32	-0.01
54	5,884	3.00	282.40	5870.92	174.18	-258.42	-175.80	311.63	303.98	0.33	-0.32
55	5,979	2.80	283.80	5965.80	175.26	-263.10	-176.91	316.13	303.67	0.22	-0.21
56	6,073	2.70	285.10	6059.69	176.39	-267.46	-178.07	320.39	303.40	0.13	-0.11
57	6,167	2.40	284.50	6153.60	177.46	-271.51	-179.16	324.36	303.17	0.32	-0.01
58	6,262	2.10	282.20	6248.52	178.32	-275.13	-180.05	327.87	302.95	0.33	-0.01
59	6,356	2.00	283.30	6342.46	179.07	-278.41	-180.81	331.03	302.75	0.11	0.00
60	6,451	1.60	280.10	6437.42	179.68	-281.33	-181.44	333.82	302.57	0.43	-0.44
61	6,545	1.50	278.20	6531.38	180.08	-283.84	-181.86	336.15	302.39	0.12	0.00
62	6,640	1.00	272.70	6626.36	180.30	-285.90	-182.09	338.01	302.24	0.54	-0.53
63	6,734	1.20	271.30	6720.34	180.36	-287.71	-182.17	339.57	302.08	0.21	0.21
64	6,828	1.00	298.10	6814.33	180.77	-289.41	-182.59	341.23	301.99	0.58	-0.21

www.blm.gov/nm/st/en.html

Roswell, New Mexico 88201-2019

Pecos District

BUREAU OF LAND MANAGEMENT






Company:	ConocoPhillips Company		
Well Name:	War Hammer 25 Federal COM W3 1H		
Location:	Lea County, NM		
Rig:	H&P #486	Magnetic Declination:	6.79
Job Number:	DDMO-150568		
API #:	30-025-42029		

Vertical Section Azimuth:	179.64	Proposed Direction:	179.64
---------------------------	--------	---------------------	--------

Survey Calculation Method:	Minimum Curvature
----------------------------	-------------------

PTB:	MD	INC	AZM	TVD	N/S	E/W	VS				
	20,027	92	181.1	13145.21	-7005.25	-208.53	7003.81				
#	Depth Feet	Inc Degrees	Azm Degrees	TVD Feet	N/S Feet	E/W Feet	Surface Vert Sec	Closure Distance	Closure Azm	DLS/100	BU/100
65	6,923	1.10	322.70	6909.31	181.89	-290.70	-183.71	342.91	302.03	0.48	0.0
66	7,017	0.90	321.40	7003.30	183.18	-291.70	-185.01	344.45	302.13	0.21	-0.0
67	7,112	0.70	315.40	7098.29	184.18	-292.58	-186.01	345.72	302.19	0.23	-0.0
68	7,206	0.80	308.30	7192.28	184.99	-293.50	-186.83	346.93	302.22	0.15	0.0
69	7,300	0.80	294.70	7286.27	185.67	-294.61	-187.52	348.24	302.22	0.20	0.0
70	7,395	0.70	278.10	7381.26	186.03	-295.78	-187.89	349.42	302.17	0.15	-0.0
71	7,489	0.80	267.20	7475.25	186.08	-297.01	-187.94	350.48	302.07	0.15	-0.0
72	7,584	0.30	280.00	7570.25	186.09	-297.91	-187.96	351.26	301.99	0.15	-0.0
73	7,678	0.40	293.20	7664.25	186.26	-298.46	-188.14	351.81	301.97	0.11	-0.0
74	7,773	0.20	231.20	7759.25	186.29	-298.89	-188.17	352.19	301.93	0.13	-0.0
75	7,867	0.20	199.00	7853.25	186.03	-299.07	-187.91	352.21	301.88	0.13	-0.0
76	7,961	0.40	179.30	7947.24	185.55	-299.12	-187.43	352.00	301.81	0.13	-0.0
77	8,056	0.50	182.90	8042.24	184.80	-299.14	-186.68	351.62	301.71	0.13	-0.0
78	8,151	0.60	175.90	8137.24	183.89	-299.13	-185.77	351.13	301.58	0.13	-0.0
79	8,245	0.70	177.10	8231.23	182.83	-299.06	-184.71	350.52	301.44	0.11	-0.0
80	8,340	0.80	174.50	8326.22	181.59	-298.97	-183.47	349.80	301.27	0.11	-0.0
81	8,435	0.70	181.30	8421.21	180.35	-298.92	-182.22	349.11	301.10	0.14	-0.0
82	8,529	0.90	200.40	8515.21	179.08	-299.19	-180.96	348.69	300.90	0.35	0.0
83	8,624	0.90	192.80	8610.19	177.66	-299.61	-179.54	348.33	300.67	0.13	0.0
84	8,718	1.20	200.40	8704.18	176.01	-300.12	-177.90	347.93	300.39	0.35	0.0
85	8,813	1.00	193.60	8799.16	174.28	-300.66	-176.16	347.52	300.10	0.25	-0.0
86	8,907	0.80	247.90	8893.15	173.23	-301.46	-175.12	347.69	299.88	0.89	-0.21
87	9,002	0.70	232.40	8988.14	172.63	-302.54	-174.53	348.32	299.71	0.24	-0.11
88	9,096	1.10	235.90	9082.13	171.77	-303.74	-173.68	348.95	299.49	0.43	0.43
89	9,191	1.50	231.70	9177.11	170.49	-305.47	-172.41	349.83	299.17	0.43	0.42
90	9,286	1.30	232.00	9272.08	169.06	-307.30	-170.98	350.73	298.82	0.21	-0.0
91	9,380	1.60	267.30	9366.05	168.34	-309.45	-170.28	352.27	298.55	0.98	0.2
92	9,475	1.80	264.80	9461.01	168.14	-312.26	-170.10	354.65	298.30	0.22	0.2
93	9,569	1.90	265.20	9554.96	167.88	-315.28	-169.85	357.19	298.03	0.11	0.1
94	9,663	2.10	251.00	9648.90	167.19	-318.46	-169.18	359.68	297.70	0.57	0.2
95	9,746	2.10	227.00	9731.85	165.65	-321.01	-167.67	361.23	297.30	1.05	0.00
96	9,841	2.10	215.70	9826.78	163.05	-323.30	-165.08	362.09	296.76	0.44	0.00

United States Department of the Interior
 Bureau of Land Management
 Pecos District
 Roswell, New Mexico 88201-2019
 www.blm.gov/nm/sc/en.html






Company:	ConocoPhillips Company		
Well Name:	War Hammer 25 Federal COM W3 1H		
Location:	Lea County, NM		
Rig:	H&P #486	Magnetic Declination:	6.79
Job Number:	DDMO-150568		
API #:	30-025-42029		

Vertical Section Azimuth:	179.64	Proposed Direction:	179.64
---------------------------	--------	---------------------	--------

Survey Calculation Method:	Minimum Curvature
----------------------------	-------------------

PTB:	MD	INC	AZM	TVD	N/S	E/W	VS				
	20,027	92	181.1	13145.21	-7005.25	-208.53	7003.81				
#	Depth Feet	Inc Degrees	Azm Degrees	TVD Feet	N/S Feet	E/W Feet	Surface Vert Sec	Closure Distance	Closure Azm	DLS/100	BU/100
97	9,936	1.10	178.20	9921.75	160.73	-324.29	-162.76	361.93	296.36	1.47	-1.55
98	10,030	1.00	131.90	10015.73	159.28	-323.65	-161.31	360.72	296.20	0.88	-0.00
99	10,124	2.00	71.50	10109.70	159.25	-321.48	-161.27	358.76	296.35	1.85	1.11
100	10,219	1.40	65.10	10204.66	160.27	-318.86	-162.27	356.87	296.69	0.66	-0.00
101	10,289	1.70	82.70	10274.64	160.76	-317.05	-162.75	355.48	296.89	0.80	-0.00
102	10,407	2.20	101.00	10392.57	160.55	-313.09	-162.51	351.86	297.15	0.66	-0.00
103	10,502	1.30	111.60	10487.52	159.80	-310.30	-161.75	349.03	297.25	0.66	-0.00
104	10,596	1.30	173.00	10581.50	158.35	-309.18	-160.29	347.37	297.12	0.66	-0.00
105	10,691	0.50	302.60	10676.50	157.51	-309.40	-159.45	347.18	296.98	0.66	-0.00
106	10,785	1.40	285.30	10770.48	158.03	-310.85	-159.98	348.71	296.95	0.66	-0.00
107	10,879	2.00	279.90	10864.44	158.61	-313.57	-160.58	351.41	296.83	0.66	-0.00
108	10,974	2.50	267.90	10959.37	158.82	-317.28	-160.81	354.81	296.59	0.66	-0.00
109	11,036	2.50	267.90	11021.31	158.72	-319.98	-160.73	357.18	296.38	0.66	-0.00
110	11,068	2.40	252.10	11053.28	158.49	-321.31	-160.51	358.28	296.26	0.66	-0.00
111	11,162	1.70	232.50	11147.22	157.04	-324.29	-159.07	360.32	295.84	1.04	-0.00
112	11,257	1.50	252.40	11242.19	155.81	-326.60	-157.85	361.86	295.50	0.62	-0.00
113	11,351	1.50	217.60	11336.15	154.46	-328.52	-156.52	363.02	295.18	0.95	0.00
114	11,445	1.60	236.40	11430.12	152.76	-330.36	-154.83	363.97	294.82	0.55	0.00
115	11,540	1.80	241.50	11525.08	151.31	-332.78	-153.40	365.57	294.45	0.26	0.00
116	11,634	1.80	249.80	11619.03	150.10	-335.46	-152.20	367.51	294.11	0.28	0.00
117	11,728	1.90	245.30	11712.98	148.94	-338.26	-151.06	369.60	293.76	0.19	0.00
118	11,823	1.70	235.80	11807.94	147.49	-340.86	-149.63	371.40	293.40	0.38	-0.21
119	11,917	1.60	228.50	11901.90	145.83	-343.00	-147.99	372.71	293.03	0.25	-0.11
120	12,011	1.40	227.10	11995.87	144.18	-344.82	-146.35	373.75	292.69	0.22	-0.21
121	12,105	1.10	214.20	12089.84	142.65	-346.17	-144.83	374.41	292.40	0.44	-0.33
122	12,158	1.10	203.30	12142.83	141.77	-346.66	-143.94	374.52	292.24	0.39	-0.00
123	12,228	1.40	203.80	12212.82	140.37	-347.27	-142.55	374.56	292.01	0.43	0.00
124	12,322	1.40	214.70	12306.79	138.37	-348.38	-140.56	374.86	291.66	0.28	0.00
125	12,417	1.60	213.80	12401.76	136.32	-349.78	-138.51	375.41	291.29	0.21	-0.21
126	12,511	2.60	189.30	12495.69	133.12	-350.86	-135.32	375.26	290.78	1.41	1.06
127	12,542	6.40	174.80	12526.59	130.71	-350.81	-132.91	374.37	290.43	12.70	12.26
128	12,574	11.30	172.40	12558.20	125.82	-350.24	-128.02	372.15	289.76	15.35	15.31

United States Department of the Interior
 Bureau of Land Management
 Pecos District
 Roswell, New Mexico 88201-2019
www.blm.gov/nm/s/en.html





Company:	ConocoPhillips Company		
Well Name:	War Hammer 25 Federal COM W3 1H		
Location:	Lea County, NM		
Rig:	H&P #486	Magnetic Declination:	6.79
Job Number:	DDMO-150568		
API #:	30-025-42029		

Vertical Section Azimuth:	179.64	Proposed Direction:	179.64
---------------------------	--------	---------------------	--------

Survey Calculation Method:	Minimum Curvature
----------------------------	-------------------

PTB:	MD	INC	AZM	TVD	N/S	E/W	VS
	20,027	92	181.1	13145.21	-7005.25	-208.53	7003.81

#	Depth Feet	Inc Degrees	Azm Degrees	TVD Feet	N/S Feet	E/W Feet	Surface Vert Sec	Closure Distance	Azm	DLS/100	BU/100
129	12,605	15.30	172.30	12588.37	118.75	-349.29	-120.94	368.92	288.78	12.90	12.90
130	12,637	18.20	173.10	12619.01	109.60	-348.12	-111.79	364.97	287.48	9.09	9.09
131	12,668	20.40	175.50	12648.26	99.41	-347.12	-101.59	361.07	285.98	7.54	7.54
132	12,700	21.70	176.40	12678.13	87.95	-346.31	-90.12	357.30	284.25	4.19	4.19
133	12,731	23.50	174.80	12706.74	76.07	-345.39	-78.24	353.66	282.42	6.14	5.50
134	12,763	25.40	174.20	12735.87	62.89	-344.11	-65.05	349.81	280.36	5.00	5.00
135	12,793	27.00	174.20	12762.79	49.71	-342.78	-51.86	346.36	278.25	5.00	5.00
136	12,825	29.00	173.90	12791.04	34.77	-341.22	-36.91	342.98	275.82	6.00	6.00
137	12,856	31.50	173.20	12817.82	19.25	-339.46	-21.39	340.01	273.25	8.00	8.00
138	12,888	33.90	172.50	12844.75	2.10	-337.30	-4.22	337.31	270.36	5.00	7.00
139	12,919	36.00	173.80	12870.15	-15.53	-335.19	13.42	335.55	267.35	6.00	6.00
140	12,951	37.60	175.40	12895.78	-34.61	-333.39	32.52	335.19	264.07	5.00	5.00
141	12,982	39.30	176.20	12920.05	-53.84	-331.98	51.75	336.32	260.79	5.00	5.00
142	13,014	42.90	175.40	12944.16	-74.81	-330.44	72.73	338.80	257.24	11.37	11.37
143	13,045	46.60	174.80	12966.18	-96.55	-328.57	94.48	342.46	253.62	12.01	11.37
144	13,077	49.90	173.90	12987.48	-120.30	-326.22	118.25	347.69	249.76	10.52	10.52
145	13,108	52.50	172.80	13006.91	-144.30	-323.41	142.26	354.15	245.95	8.83	8.83
146	13,140	53.40	172.50	13026.19	-169.63	-320.15	167.61	362.31	242.08	2.91	2.91
147	13,171	55.20	172.60	13044.27	-194.59	-316.88	192.59	371.86	238.45	5.81	5.81
148	13,202	57.20	173.10	13061.52	-220.15	-313.68	218.17	383.22	234.94	6.59	6.59
149	13,234	60.30	174.20	13078.12	-247.33	-310.66	245.38	397.09	231.47	10.12	9.98
150	13,265	62.80	174.70	13092.89	-274.46	-308.02	272.52	412.56	228.30	8.19	8.06
151	13,297	63.90	174.30	13107.24	-302.93	-305.28	301.00	430.07	225.22	3.61	3.44
152	13,328	66.20	175.40	13120.31	-330.92	-302.76	329.01	448.52	222.46	8.09	7.42
153	13,359	69.90	178.50	13131.90	-359.62	-301.24	357.72	469.12	219.95	15.11	11.90
154	13,391	72.60	181.50	13142.19	-389.92	-301.25	388.02	492.73	217.69	12.22	8.44
155	13,423	73.30	183.30	13151.57	-420.48	-302.53	418.57	518.01	215.73	5.81	7.77
156	13,454	75.70	183.00	13159.86	-450.31	-304.17	448.39	543.41	214.04	7.80	7.77
157	13,486	79.20	183.30	13166.81	-481.49	-305.89	479.56	570.44	212.43	10.98	10.98
158	13,517	82.20	183.70	13171.82	-512.02	-307.76	510.08	597.39	211.01	9.76	9.65
159	13,548	85.60	182.00	13175.11	-542.80	-309.29	540.85	624.73	209.67	12.25	10.97
160	13,580	88.60	181.30	13176.73	-574.75	-310.21	572.78	653.12	208.36	9.63	9.38

United States Department of the Interior
 BUREAU OF LAND MANAGEMENT
 Pecos District
 Roswell Field Office
 2505 West Second Street
 Roswell, New Mexico 88201-2019
 www.blm.gov/nm/ste/en.html





Company:	ConocoPhillips Company		
Well Name:	War Hammer 25 Federal COM W3 1H		
Location:	Lea County, NM		
Rig:	H&P #486	Magnetic Declination:	6.79
Job Number:	DDMO-150568		
API #:	30-025-42029		

Vertical Section Azimuth:	179.64	Proposed Direction:	179.64
---------------------------	--------	---------------------	--------

Survey Calculation Method:	Minimum Curvature
----------------------------	-------------------

PTB:	MD		INC		AZM		TVD		N/S		E/W		VS		
	20,027		92		181.1		13145.21		-7005.25		-208.53		7003.81		
#	Depth Feet	Inc Degrees	Azm Degrees	TVD Feet	N/S Feet	E/W Feet	Surface Vert Sec	Closure Distance	Closure Azm	DLS/100	BUR/100	United States Department of the Interior Bureau of Land Management Pecos District Roswell Field Office 2900 West Second Street Roswell, New Mexico 88201-2019 www.blm.gov/nm/s/en.html			
161	13,611	91.40	180.50	13176.73	-605.74	-310.69	603.77	680.77	207.15	9.39	9.39				
162	13,643	90.00	179.10	13176.34	-637.73	-310.58	635.77	709.34	205.97	6.19	-4.19				
163	13,737	90.00	178.30	13176.34	-731.71	-308.45	729.76	794.06	202.86	0.85	0.85				
164	13,832	91.00	179.10	13175.51	-826.68	-306.29	824.74	881.60	200.33	1.35	1.35				
165	13,926	91.50	179.80	13173.46	-920.65	-305.39	918.71	969.98	198.35	0.91	0.91				
166	14,021	90.40	177.50	13171.89	-1015.60	-303.15	1013.68	1059.88	196.62	0.68	-1.68				
167	14,115	90.70	176.10	13170.98	-1109.45	-297.91	1107.56	1148.75	195.03	0.68	0.68				
168	14,210	90.80	176.30	13169.74	-1204.23	-291.61	1202.38	1239.04	193.61	0.61	0.61				
169	14,305	89.50	173.10	13169.49	-1298.81	-282.84	1297.01	1329.25	192.29	0.83	-1.83				
170	14,400	89.10	172.60	13170.65	-1393.07	-271.01	1391.34	1419.18	191.01	0.83	-0.83				
171	14,494	89.80	175.20	13171.55	-1486.52	-261.03	1484.85	1509.26	189.96	0.83	0.83				
172	14,589	90.20	174.60	13171.55	-1581.14	-252.58	1579.53	1601.19	189.08	0.83	0.83				
173	14,683	90.70	174.00	13170.82	-1674.68	-243.25	1673.11	1692.25	188.26	0.83	0.83				
174	14,777	90.40	175.70	13169.91	-1768.29	-234.81	1766.78	1783.81	187.56	1.84	-0.84				
175	14,872	89.80	179.00	13169.75	-1863.17	-230.42	1861.69	1877.37	187.05	3.53	-0.53				
176	14,966	91.00	182.70	13169.09	-1957.14	-231.81	1955.65	1970.82	186.75	4.14	1.14				
177	15,061	88.90	177.60	13169.17	-2052.11	-232.06	2050.61	2065.19	186.45	5.81	-2.81				
178	15,155	88.60	179.10	13171.22	-2146.04	-229.35	2144.56	2158.26	186.10	1.63	-0.63				
179	15,249	92.40	187.10	13170.40	-2239.81	-234.43	2238.29	2252.04	185.98	9.42	4.42				
180	15,344	89.00	182.20	13169.24	-2334.45	-242.13	2332.88	2346.97	185.92	6.28	-3.28				
181	15,438	91.00	182.00	13169.24	-2428.38	-245.57	2426.79	2440.76	185.77	2.14	2.14				
182	15,532	90.10	179.20	13168.34	-2522.36	-246.55	2520.76	2534.38	185.58	3.13	-0.96				
183	15,627	90.60	177.90	13167.76	-2617.32	-244.15	2615.74	2628.69	185.33	1.47	0.53				
184	15,721	91.00	178.70	13166.45	-2711.27	-241.36	2709.70	2721.99	185.09	0.95	0.43				
185	15,816	90.60	177.90	13165.12	-2806.22	-238.54	2804.67	2816.34	184.86	0.94	-0.46				
186	15,910	91.00	178.10	13163.81	-2900.15	-235.26	2898.62	2909.68	184.64	0.48	0.48				
187	16,004	90.20	175.90	13162.82	-2994.01	-230.34	2992.51	3002.86	184.40	2.49	0.85				
188	16,098	89.90	176.30	13162.74	-3087.79	-223.95	3086.33	3095.90	184.15	0.53	0.32				
189	16,193	89.10	176.70	13163.57	-3182.61	-218.15	3181.18	3190.08	183.92	0.94	0.81				
190	16,287	89.90	180.80	13164.39	-3276.57	-216.10	3275.14	3283.68	183.77	4.44	0.85				
191	16,382	91.10	183.70	13163.56	-3371.48	-219.83	3370.03	3378.64	183.73	3.30	1.26				
192	16,476	91.10	183.50	13161.76	-3465.27	-225.73	3463.79	3472.62	183.73	0.21	0.00				





Company:	ConocoPhillips Company		
Well Name:	War Hammer 25 Federal COM W3 1H		
Location:	Lea County, NM		
Rig:	H&P #486	Magnetic Declination:	6.79
Job Number:	DDMO-150568		
API #:	30-025-42029		

Vertical Section Azimuth:	179.64	Proposed Direction:	179.64
---------------------------	--------	---------------------	--------

Survey Calculation Method:	Minimum Curvature
----------------------------	-------------------

PTB:	MD	INC	AZM	TVD	N/S	E/W	VS
	20,027	92	181.1	13145.21	-7005.25	-208.53	7003.81

#	Depth Feet	Inc Degrees	Azm Degrees	TVD Feet	N/S Feet	E/W Feet	Surface Vert Sec	Closure Distance	Azm	DLS/100	BUR/100
193	16,571	90.50	184.00	13160.43	-3560.06	-231.95	3558.53	3567.61	183.73	0.82	-0.93
194	16,665	90.70	182.30	13159.45	-3653.91	-237.11	3652.35	3661.60	183.71	1.82	0.00
195	16,760	88.40	178.70	13160.19	-3748.88	-237.94	3747.31	3756.42	183.63	4.50	-2.88
196	16,854	88.70	179.10	13162.57	-3842.83	-236.14	3841.27	3850.08	183.52	0.53	0.00
197	16,949	91.90	177.60	13162.07	-3937.78	-233.40	3936.23	3944.69	183.39	3.72	3.33
198	17,043	88.60	172.10	13161.66	-4031.35	-224.97	4029.86	4037.62	183.19	8.82	-3.33
199	17,138	91.30	175.60	13161.75	-4125.78	-214.79	4124.35	4131.37	182.98	2.90	2.22
200	17,232	88.00	172.30	13162.32	-4219.23	-204.89	4217.86	4224.20	182.78	1.82	-3.11
201	17,296	88.10	172.60	13164.50	-4282.64	-196.48	4281.32	4287.14	182.63	4.41	0.00
202	17,359	90.30	176.30	13165.38	-4345.32	-190.39	4344.04	4349.49	182.51	3.33	3.33
203	17,453	93.10	181.90	13162.59	-4439.22	-188.91	4437.95	4443.24	182.44	2.22	2.22
204	17,547	94.60	187.10	13156.27	-4532.68	-196.27	4531.36	4536.93	182.48	1.11	1.11
205	17,642	92.50	188.10	13150.39	-4626.66	-208.81	4625.26	4631.37	182.58	4.45	-2.11
206	17,736	89.80	184.90	13148.50	-4720.02	-219.44	4718.55	4725.12	182.66	4.45	-2.11
207	17,830	91.60	189.20	13147.35	-4813.27	-230.97	4811.73	4818.81	182.75	4.96	1.11
208	17,925	87.90	186.40	13147.77	-4907.37	-243.86	4905.74	4913.42	182.84	4.88	-3.99
209	18,019	89.50	184.80	13149.90	-5000.89	-253.03	4999.20	5007.29	182.90	2.41	1.11
210	18,113	91.30	184.90	13149.25	-5094.55	-260.98	5092.81	5101.23	182.93	1.92	1.11
211	18,207	91.40	184.40	13147.03	-5188.21	-268.60	5186.42	5195.16	182.96	0.54	0.00
212	18,302	89.30	183.90	13146.45	-5282.96	-275.47	5281.12	5290.13	182.98	2.27	-2.11
213	18,396	87.40	177.60	13149.16	-5376.86	-276.71	5375.01	5383.97	182.95	7.00	-2.22
214	18,490	91.30	179.40	13150.23	-5470.80	-274.25	5468.97	5477.67	182.87	4.57	4.15
215	18,585	88.00	174.90	13150.81	-5565.64	-269.53	5563.84	5572.16	182.77	5.87	-3.47
216	18,679	90.30	177.50	13152.20	-5659.41	-263.30	5657.64	5665.53	182.66	3.69	2.45
217	18,773	89.30	177.00	13152.53	-5753.30	-258.79	5751.56	5759.12	182.58	1.19	-1.00
218	18,867	90.50	179.80	13152.69	-5847.25	-256.16	5845.53	5852.86	182.51	3.22	2.22
219	18,962	89.10	171.80	13153.03	-5941.92	-249.21	5940.23	5947.14	182.40	8.55	1.44
220	19,056	91.40	177.50	13152.61	-6035.46	-240.45	6033.83	6040.25	182.28	6.50	-4.45
221	19,151	91.30	177.70	13150.38	-6130.35	-236.47	6128.74	6134.91	182.21	0.24	0.11
222	19,245	91.30	177.40	13148.24	-6224.24	-232.46	6222.66	6228.58	182.14	0.32	0.00
223	19,339	91.00	176.00	13146.36	-6318.06	-227.05	6316.51	6322.14	182.06	1.52	-0.32
224	19,434	90.20	174.60	13145.36	-6412.74	-219.26	6411.23	6416.48	181.96	1.70	-0.84

Bureau of Land Management
 Pecos District
 2909 West Central Street
 Roswell, New Mexico 88201-2019
www.blm.gov/nm/st/en.html

TAKE PRIDE IN AMERICA

Company:	ConocoPhillips Company	
Well Name:	War Hammer 25 Federal COM W3 1H	
Location:	Lea County, NM	
Rig:	H&P #486	Magnetic Declination: 6.79
Job Number:	DDMO-150568	
API #:	30-025-42029	
Vertical Section Azimuth:	179.64	Proposed Direction: 179.64
Survey Calculation Method:	Minimum Curvature	

PTB:	MD	INC	AZM	TVD	N/S	E/W	VS
	20,027	92	181.1	13145.21	-7005.25	-208.53	7003.81

#	Depth Feet	Inc Degrees	Azm Degrees	TVD Feet	N/S Feet	E/W Feet	Surface Vert Sec	Closure Distance	Closure Azm	DLS/100	BUR/100'
225	19,528	92.20	181.10	13143.39	-6506.59	-215.74	6505.11	6510.17	181.90	7.23	2.13
226	19,623	88.30	177.10	13142.98	-6601.54	-214.25	6600.07	6605.02	181.86	5.88	-4.11
227	19,717	88.50	177.70	13145.60	-6695.41	-209.98	6693.96	6698.70	181.80	0.67	0.21
228	19,812	88.60	178.90	13148.01	-6790.34	-207.17	6788.90	6793.49	181.75	1.27	0.11
229	19,906	90.60	180.40	13148.66	-6884.32	-206.59	6882.89	6887.42	181.72	2.66	2.13
230	19,969	92.00	181.10	13147.23	-6947.30	-207.42	6945.86	6950.40	181.71	2.48	2.22