



Marbob

Eddy County
Shocker 20 Federal
#1H
OH

Survey: MWD #1

Pathfinder X & Y Survey Report

07 December, 2009

PATHFINDER



Pathfinder Energy Services

Pathfinder X & Y Survey Report



Company: Marbob
Project: Eddy County
Site: Shocker 20 Federal
Well: #1H
Wellbore: OH
Design: OH

Local Co-ordinate Reference: Well #1H
TVD Reference: WELL @ 2995 00ft (22' KB Correction)
MD Reference: WELL @ 2995 00ft (22' KB Correction)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: Midland Database

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

Site	Shocker 20 Federal				
Site Position:		Northing:	404,989.300 ft	Latitude:	32° 6' 46 902 N
From:	Map	Easting:	598,969.300 ft	Longitude:	104° 0' 49 248 W
Position Uncertainty:	0 00 ft	Slot Radius:	"	Grid Convergence:	0 17 °

Well		#1H				
Well Position	+N/-S	0 00 ft	Northing:	404,989.300 ft	Latitude:	32° 6' 46 902 N
	+E/-W	0.00 ft	Easting:	598,969.300 ft	Longitude:	104° 0' 49 248 W
Position Uncertainty		0 00 ft	Wellhead Elevation:	ft	Ground Level:	2,973 00 ft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	11/28/2009	7 95	60.06	48,687

Design	OH				
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	87 88	



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Survey Program Date 12/07/2009

From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
78 00	6,478 00	Gyro #1 (OH)	CB-GYRO-MS	Camera based gyro multishot
6 563 00	11,522 00	MWD #1 (OH)	MWD	MWD - Standard

MD (ft)	Inc (°)	Azi (°)	TVD (ft)	TVDSS (ft)	N/S (ft)	E/W (ft)	V. Sec (ft)	DLeg (°/100ft)	Northing (ft)	Easting (ft)
6,478 00	0 38	233 02	6,476 86	3,481.86	-36.70	6 11	4 75	0 00	404,952 60	598,975 41
6,563 00	0 44	189 38	6,561 86	3,566 86	-37.19	5 84	4 46	0 36	404,952 11	598,975 14
6,595 00	2 46	80 57	6,593.85	3,598 85	-37 20	6 49	5 11	8 23	404,952 10	598,975 79
6,627 00	9 23	68 76	6,625 66	3,630 66	-36 16	9 57	8 22	21 38	404,953 14	598,978 67
6,658 00	15 04	76 99	6,655 96	3,660 96	-34 35	15 81	14 53	19 51	404,954 95	598,985 11
6,690 00	19 43	80 31	6,686 52	3,691 52	-32.52	25 11	23 88	14 05	404,956 78	598,994 41
6,722 00	21 81	86 53	6,716 47	3,721.47	-31 26	36 29	35 11	10 10	404,958 04	599,005 59
6,754 00	25 32	85 21	6,745 80	3,750 80	-30 33	49 04	47 89	11 09	404,958 97	599,018 34
6 785 00	27 26	85 70	6,773 59	3,778 59	-29.24	62 73	61 61	6 30	404,960 06	599,032 03
6,817 00	29 63	85 96	6,801 72	3,806 72	-28 14	77 93	76 84	7 42	404,961 16	599,047 23
6,849 00	32.01	84 59	6,829 20	3,834 20	-26.78	94 27	93 21	7 75	404,962.52	599,063.57
6,881 00	33 94	86 34	6,856.05	3,861 05	-25.41	111.63	110 61	6 73	404,963 89	599,080 93
6,913 00	37 11	87 36	6,882.09	3,887 09	-24.40	130.19	129 20	10 08	404,964 90	599,099 49
6,944 00	40 63	88 04	6,906 22	3,911.22	-23 62	149 63	148 65	11 44	404,965 68	599,118 93
6,976 00	44 23	87 46	6,929 83	3,934 83	-22 77	171 20	170 24	11 32	404,966 53	599,140 50
7,008 00	47 66	86 36	6,952 08	3,957 08	-21.52	194 16	193 23	11 00	404,967.78	599,163 46
7,040 00	51 00	85 92	6,972.93	3,977 93	-19.89	218 37	217 48	10 49	404,969 41	599,187 67
7,072 00	54 08	84 56	6,992 40	3,997 40	-17 77	243 68	242 85	10 20	404,971.53	599,212 98
7,103 00	57 33	84 49	7,009 86	4,014 86	-15 33	269 17	268 42	10 49	404,973 97	599,238 47
7,135 00	60 76	85 73	7,026 32	4,031 32	-13.00	296 51	295 82	11 22	404,976 30	599,265 81
7,167 00	65 60	85 54	7,040 75	4,045 75	-10.82	324 97	324 35	15 13	404,978 48	599,294 27



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MD (ft)	Inc (°)	Azi (°)	TVD (ft)	TVDSS (ft)	N/S (ft)	E/W (ft)	V. Sec (ft)	DLeg (°/100ft)	Northing (ft)	Easting (ft)
7,199 00	70 43	84 04	7,052 73	4,057 73	-8.12	354 51	353 97	15 71	404,981 18	599,323 81
7,230 00	75 10	84 31	7,061 91	4,066 91	-5 12	383 96	383 51	15 09	404,984 18	599,353 26
7,261 00	77 56	88 63	7,069 24	4,074 24	-3 27	414 01	413 61	15 69	404,986 03	599,383 31
7,293 00	81 60	90 47	7,075 03	4,080 03	-3 03	445 48	445 06	13 83	404,986 27	599,414 78
7,325 00	81 69	90 65	7,079 68	4,084 68	-3 34	477 14	476 69	0 62	404,985 96	599,446 44
7,357 00	83 27	90 28	7,083 86	4,088 86	-3 59	508 86	508 38	5 07	404,985 71	599,478 16
7,388 00	83 27	89 63	7,087 50	4,092 50	-3 57	539 65	539 14	2 08	404,985 73	599,508 95
7,420 00	85 03	88 25	7,090 76	4,095 76	-2 98	571 47	570 97	6 98	404,986 32	599,540 77
7,452 00	86 88	86 52	7,093 02	4,098 02	-1 52	603 36	602 89	7 91	404,987 78	599,572 66
7,484 00	86 97	84 99	7,094 73	4,099 73	0 84	635 22	634 82	4 78	404,990 14	599,604 52
7,516 00	86 79	84 82	7,096 47	4,101 47	3 68	667 05	666 73	0 77	404,992 98	599,636 35
7,547 00	89 34	85 14	7,097 52	4,102 52	6 39	697 91	697 67	8 29	404,995 69	599,667 21
7,578 00	92 15	84 87	7,097 12	4,102 12	9 09	728 78	728 62	9 11	404,998 39	599,698 08
7,674 00	94 35	85 23	7,091 68	4,096 68	17 36	824 27	824 34	2 32	405,006 66	599,793 57
7,769 00	92 24	85 90	7,086 22	4,091 22	24 69	918 82	919 10	2 33	405,013 99	599,888 12
7,864 00	91 45	86 35	7,083 16	4,088 16	31 11	1,013 55	1,014 01	0 96	405,020 41	599,982 85
7,959 00	89 78	87 72	7,082 14	4,087 14	36 02	1,108 41	1,108 99	2 27	405,025 32	600,077 71
8,054 00	88 46	87 27	7,083 60	4,088 60	40 17	1,203 31	1,203 97	1 47	405,029 47	600,172 61
8,150 00	91 80	88 43	7,083 38	4,088 38	43 78	1,299 23	1,299 96	3 68	405,033 08	600,268 53
8,245 00	91 19	88 02	7,080 90	4,085 90	46 72	1,394 15	1,394 92	0 77	405,036 02	600,363 45
8,340 00	90 66	85 98	7,079 37	4,084 37	51 69	1,489 00	1,489 89	2 22	405,040 99	600,458 30
8,435 00	91 28	86 99	7,077 76	4,082 76	57 51	1,583 81	1,584 85	1 25	405,046 81	600,553 11
8,531 00	90 66	86 37	7,076 13	4,081 13	63 07	1,679 63	1,680 81	0 91	405,052 37	600,648 93
8,626 00	90 75	87 64	7,074 96	4,079 96	68 03	1,774 49	1,775 79	1 34	405,057 33	600,743 79
8,721 00	89 16	88 04	7,075 04	4,080 04	71 61	1,869 42	1,870 79	1 73	405,060 91	600,838 72
8,816 00	89 34	86 84	7,076 28	4,081 28	75 86	1,964 32	1,965 78	1 28	405,065 16	600,933 62
8,912 00	89 08	88 29	7,077 61	4,082 61	79 93	2,060 22	2,061 76	1 53	405,069 23	601,029 52



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9,007 00	88 37	88 36	7,079 72	4,084 72	82 71	2,155.15	2,156 74	0 75	405,072 01	601,124 45
9,103 00	89 16	87 59	7,081 79	4,086 79	86 10	2,251 07	2,252 71	1 15	405,075 40	601,220 37
9,198 00	90 92	89 13	7,081 72	4,086 72	88.82	2,346 02	2,347 70	2 46	405,078 12	601,315 32
9,293 00	91 89	88.02	7,079 39	4,084 39	91 18	2,440 96	2,442 67	1 55	405,080 48	601,410 26
9,389 00	93 30	88 02	7,075.05	4,080 05	94 50	2,536.81	2,538 56	1 47	405,083 80	601,506 11
9,484 00	91 89	89.02	7,070 75	4,075.75	96 95	2,631 67	2,633 46	1 82	405,086 25	601,600 97
9,579 00	91 45	88 70	7,067 98	4,072 98	98.84	2,726.61	2,728 40	0 57	405,088 14	601,695 91
9,674 00	89 69	88 50	7,067 03	4,072 03	101 16	2,821 58	2,823 39	1 86	405,090 46	601,790 88
9,770 00	90 31	88 45	7,067 03	4,072.03	103 71	2,917.54	2,919 38	0 65	405,093.01	601,886 84
9,865 00	91 80	89 39	7,065 28	4,070 28	105 50	3,012.50	3,014 35	1 85	405,094 80	601,981 80
9,961 00	90 66	89 86	7,063 22	4,068 22	106 13	3,106.48	3,110 28	1 28	405,095.43	602,077 78
10,056 00	86 88	88 47	7,065 26	4,070 26	107 51	3,203 43	3,205 21	4 24	405,096 81	602,172 73
10,151 00	88 02	89 92	7,069 49	4,074 49	108 85	3,296 32	3,300 09	1 94	405,098.15	602,267 62
10,247 00	86.70	90 08	7,073.91	4,078 91	108 85	3,394.22	3,395 92	1 39	405,098 15	602,363 52
10,342 00	86 61	89 05	7,079 45	4,084 45	109 57	3,489 05	3,490 71	1 09	405,098.87	602,458 35
10,437 00	87 32	88 87	7,084 48	4,089 48	111 29	3,583.90	3,585 56	0 77	405,100.59	602,553 20
10,533 00	89 16	87 69	7,087 43	4,092 43	114 17	3,679 81	3,681 51	2.28	405,103 47	602,649 11
10,628 00	89 16	86 44	7,088 82	4,093 82	119.03	3,774.67	3,776 49	1 32	405,108 33	602,743 97
10,724 00	89 96	86 58	7,089.56	4,094 56	124 88	3,870.49	3,872.46	0 85	405,114 18	602,839 79
10,819 00	89 16	85 74	7,090 29	4,095.29	131 24	3,965.27	3,967 41	1 22	405,120 54	602,934 57
10,915 00	88 90	85 38	7,091.92	4,096.92	138 67	4,060 97	4,063.32	0 46	405,127 97	603,030 27
11,007 00	90 48	84.39	7,092 41	4,097.41	146 87	4,152 60	4,155 19	2 03	405,136.17	603,121 90
11,101 00	90 92	83 79	7,091 27	4,096.27	156 55	4,246 09	4,248 97	0 79	405,145 85	603,215 39
11,196 00	91 28	83 61	7,089 44	4,094 44	166 97	4,340 50	4,343 70	0 42	405,156.27	603,309 80
11,290 00	91 10	81 63	7,087 49	4,092 49	179 04	4,433 69	4,437.28	2 11	405,168.34	603,402 99
11,385 00	90 92	83.51	7,085 81	4,090 81	191.32	4,527.88	4,531 86	1 99	405,180 62	603,497 18
11,449 00	90 84	82 73	7,084 83	4,089 83	198 99	4,591 41	4,595 63	1 23	405,188 29	603,560 71



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11,519.69	90.84	82.73	7,083.80	4,088.80	207.93	4,661.52	4,666.02	0.00	405,197.23	603,630.82
PBHL#1H										
11,522.00	90.84	82.73	7,083.76	4,088.76	208.23	4,663.81	4,668.32	0.00	405,197.53	603,633.11

Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
PBHL#1H - survey misses by 36.02ft at 11519.69ft MD (7083.80 TVD, 207.93 N, 4661.52 E) - Point	0.00	0.00	7,080.00	172.40	4,666.00	405,161.700	603,635.300	32° 6' 48.468 N	103° 59' 54.989 W

Checked By: _____ Approved By: _____ Date: _____

Surf: 1750' F9L, 330' FWL
EOL: 1958' F9L, 286' FEL