



Marbob

Eddy County
VT 36 State
#1
OH

30-015-37690

Survey: MWD #1

Pathfinder X & Y Survey Report

20 September, 2010

PATHFINDER®

A Schlumberger Company



Pathfinder
Pathfinder X & Y Survey Report

PATHFINDER
A Schlumberger Company

Company:	Marbob	Local Co-ordinate Reference:	Well #1
Project:	Eddy County	TVD Reference:	WELL @ 3470.00ft (Original Well Elev)
Site:	VT 36 State	MD Reference:	WELL @ 3470.00ft (Original Well Elev)
Well:	#1	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Midland Database

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

Site	VT 36 State		
Site Position:		Northing:	590,321.500 ft
From:	Map	Easting:	465,535.700 ft
Position Uncertainty:	0.00 ft	Slot Radius:	"
		Latitude:	32° 37' 22.251 N
		Longitude:	104° 26' 42.985 W
		Grid Convergence:	-0.06 °

Well		#1				
Well Position	+N/-S	0.00 ft	Northing:	590,321.500 ft	Latitude:	32° 37' 22.251 N
	+E/-W	0.00 ft	Easting:	465,535.700 ft	Longitude:	104° 26' 42.985 W
Position Uncertainty	0.00 ft	Wellhead Elevation:	ft	Ground Level:	3,451.00 ft	

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	08/13/10	8.10	60.44	48,874

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	180.18



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Survey Program Date 09/20/10

From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
100.00	2,222.00	GYRO (OH)	CT_GYRO_MS	Continuous Gyro Multishot
2,288.00	7,078.00	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)
2,222.00	1.74	306.26	2,220.28	-1,249.72	62.95	-49.88	-62.80	0.00	590,384.45	465,485.82
2,288.00	6.68	192.73	2,286.13	-1,183.87	59.80	-51.54	-59.63	11.43	590,381.30	465,484.16
2,320.00	11.96	185.96	2,317.70	-1,152.30	54.68	-52.30	-54.52	16.82	590,376.18	465,483.40
2,352.00	16.97	184.21	2,348.68	-1,121.32	46.72	-52.98	-46.55	15.71	590,368.22	465,482.72
2,383.00	20.05	181.30	2,378.07	-1,091.93	36.89	-53.44	-36.72	10.37	590,358.39	465,482.26
2,414.00	23.04	179.55	2,406.90	-1,063.10	25.51	-53.51	-25.34	9.86	590,347.01	465,482.19
2,443.00	25.41	177.44	2,433.34	-1,036.66	13.62	-53.19	-13.45	8.70	590,335.12	465,482.51
2,475.00	27.52	172.25	2,461.99	-1,008.01	-0.57	-51.88	0.73	9.78	590,320.93	465,483.82
2,507.00	29.37	166.71	2,490.13	-979.87	-15.53	-49.08	15.69	10.07	590,305.97	465,486.62
2,538.00	32.18	163.02	2,516.77	-953.23	-30.83	-44.92	30.97	10.92	590,290.67	465,490.78
2,570.00	35.70	165.05	2,543.31	-926.69	-48.01	-40.02	48.13	11.55	590,273.49	465,495.68
2,602.00	38.60	166.98	2,568.82	-901.18	-66.76	-35.36	66.87	9.77	590,254.74	465,500.34
2,633.00	41.86	166.89	2,592.48	-877.52	-86.26	-30.84	86.36	10.52	590,235.24	465,504.86
2,665.00	45.73	166.80	2,615.57	-854.43	-107.82	-25.80	107.90	12.10	590,213.68	465,509.90
2,696.00	49.24	167.07	2,636.52	-833.48	-130.08	-20.63	130.14	11.34	590,191.42	465,515.07
2,727.00	53.29	167.51	2,655.91	-814.09	-153.66	-15.32	153.71	13.11	590,167.84	465,520.38
2,759.00	57.42	168.21	2,674.10	-795.90	-179.39	-9.79	179.42	13.03	590,142.11	465,525.91
2,790.00	60.85	168.82	2,690.00	-780.00	-205.47	-4.49	205.48	11.19	590,116.03	465,531.21
2,822.00	64.90	169.00	2,704.59	-765.41	-233.41	0.98	233.41	12.67	590,088.09	465,536.68
2,853.00	68.50	169.35	2,716.85	-753.15	-261.37	6.33	261.35	11.66	590,060.13	465,542.03
2,885.00	72.28	169.79	2,727.59	-742.41	-291.01	11.78	290.97	11.88	590,030.49	465,547.48



Pathfinder

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Project: Eddy County
Site: VT 36 State
Well: #1
Wellbore: OH
Design: OH

Local Co-ordinate Reference: Well #1
TVD Reference: WELL @ 3470.00ft (Original Well Elev)
MD Reference: WELL @ 3470.00ft (Original Well Elev)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: Midland Database

Survey											
MD (ft)	Inc (°)	Azi (°)	TVD (ft)	TVDSS (ft)	N/S (ft)	E/W (ft)	V. Sec (ft)	DLeg (°/100ft)	Northing (ft)	Easting (ft)	
2,917.00	75.45	170.67	2,736.48	-733.52	-321.30	17.00	321.25	10.25	590,000.20	465,552.70	
2,948.00	79.40	169.88	2,743.23	-726.77	-351.12	22.11	351.05	12.98	589,970.38	465,557.81	
2,980.00	83.71	168.56	2,747.93	-722.07	-382.20	28.03	382.11	14.07	589,939.30	465,563.73	
3,012.00	87.05	167.15	2,750.50	-719.50	-413.38	34.74	413.27	11.32	589,908.12	465,570.44	
3,044.00	89.16	166.80	2,751.56	-718.44	-444.54	41.95	444.40	6.68	589,876.96	465,577.65	
3,075.00	91.19	166.80	2,751.47	-718.53	-474.72	49.03	474.56	6.55	589,846.78	465,584.73	
3,138.00	91.45	168.12	2,750.02	-719.98	-536.20	62.70	536.00	2.13	589,785.30	465,598.40	
3,202.00	90.92	169.97	2,748.69	-721.31	-599.01	74.86	598.77	3.01	589,722.49	465,610.56	
3,265.00	91.10	171.90	2,747.58	-722.42	-661.21	84.78	660.94	3.08	589,660.29	465,620.48	
3,329.00	91.45	173.92	2,746.16	-723.84	-724.71	92.68	724.41	3.20	589,596.79	465,628.38	
3,392.00	91.28	174.71	2,744.66	-725.34	-787.38	98.92	787.06	1.28	589,534.12	465,634.62	
3,455.00	90.04	176.38	2,743.93	-726.07	-850.18	103.81	849.85	3.30	589,471.32	465,639.51	
3,519.00	89.16	177.61	2,744.38	-725.62	-914.09	107.17	913.75	2.36	589,407.41	465,642.87	
3,582.00	89.08	179.02	2,745.35	-724.65	-977.05	109.02	976.70	2.24	589,344.45	465,644.72	
3,645.00	87.58	180.51	2,747.18	-722.82	-1,040.02	109.28	1,039.67	3.36	589,281.48	465,644.98	
3,707.00	87.05	181.44	2,750.09	-719.91	-1,101.94	108.23	1,101.60	1.73	589,219.56	465,643.93	
3,802.00	87.67	180.87	2,754.46	-715.54	-1,196.82	106.31	1,196.48	0.89	589,124.68	465,642.01	
3,897.00	88.46	180.97	2,757.67	-712.33	-1,291.75	104.79	1,291.42	0.84	589,029.75	465,640.49	
3,992.00	89.08	180.69	2,759.71	-710.29	-1,386.72	103.41	1,386.39	0.72	588,934.78	465,639.11	
4,087.00	91.01	180.66	2,759.63	-710.37	-1,481.71	102.29	1,481.38	2.03	588,839.79	465,637.99	
4,182.00	91.54	180.46	2,757.52	-712.48	-1,576.68	101.37	1,576.36	0.60	588,744.82	465,637.07	
4,277.00	89.16	180.30	2,756.94	-713.06	-1,671.67	100.74	1,671.35	2.51	588,649.83	465,636.44	
4,371.00	89.16	179.69	2,758.32	-711.68	-1,765.66	100.74	1,765.34	0.65	588,555.84	465,636.44	
4,466.00	89.52	179.51	2,759.41	-710.59	-1,860.65	101.41	1,860.32	0.42	588,460.85	465,637.11	
4,561.00	91.54	180.86	2,758.53	-711.47	-1,955.64	101.10	1,955.31	2.56	588,365.86	465,636.80	
4,656.00	92.42	181.42	2,755.25	-714.75	-2,050.56	99.21	2,050.24	1.10	588,270.94	465,634.91	
4,751.00	91.45	181.97	2,752.04	-717.96	-2,145.47	96.40	2,145.15	1.17	588,176.03	465,632.10	



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Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	Midland Database

Survey											
MD (ft)	Inc (°)	Azi (°)	TVD (ft)	TVDSS (ft)	N/S (ft)	E/W (ft)	V. Sec (ft)	DLeg (°/100ft)	Northing (ft)	Easting (ft)	
4,846.00	90.57	182.41	2,750.37	-719.63	-2,240.38	92.77	2,240.08	1.04	588,081.12	465,628.47	
4,941.00	90.04	182.85	2,749.86	-720.14	-2,335.28	88.41	2,334.99	0.73	587,986.22	465,624.11	
5,036.00	90.13	182.70	2,749.72	-720.28	-2,430.17	83.81	2,429.89	0.18	587,891.33	465,619.51	
5,130.00	90.13	183.30	2,749.51	-720.49	-2,524.04	78.90	2,523.78	0.64	587,797.46	465,614.60	
5,225.00	89.96	183.61	2,749.43	-720.57	-2,618.87	73.17	2,618.62	0.37	587,702.63	465,608.87	
5,320.00	90.13	183.48	2,749.36	-720.64	-2,713.68	67.30	2,713.46	0.23	587,607.82	465,603.00	
5,415.00	89.34	182.60	2,749.80	-720.20	-2,808.55	62.26	2,808.34	1.24	587,512.95	465,597.96	
5,510.00	90.40	183.35	2,750.01	-719.99	-2,903.42	57.33	2,903.22	1.37	587,418.08	465,593.03	
5,604.00	89.78	182.82	2,749.87	-720.13	-2,997.28	52.27	2,997.10	0.87	587,324.22	465,587.97	
5,700.00	89.52	182.65	2,750.45	-719.55	-3,093.17	47.69	3,093.00	0.32	587,228.33	465,583.39	
5,795.00	88.81	181.91	2,751.84	-718.16	-3,188.08	43.91	3,187.93	1.08	587,133.42	465,579.61	
5,890.00	89.60	182.17	2,753.16	-716.84	-3,283.01	40.53	3,282.87	0.88	587,038.49	465,576.23	
5,985.00	90.22	181.66	2,753.30	-716.70	-3,377.96	37.35	3,377.82	0.85	586,943.54	465,573.05	
6,080.00	89.16	181.03	2,753.82	-716.18	-3,472.93	35.12	3,472.80	1.30	586,848.57	465,570.82	
6,175.00	89.34	181.58	2,755.06	-714.94	-3,567.90	32.96	3,567.77	0.61	586,753.60	465,568.66	
6,269.00	89.43	180.88	2,756.07	-713.93	-3,661.87	30.94	3,661.75	0.75	586,659.63	465,566.64	
6,364.00	90.22	179.76	2,756.36	-713.64	-3,756.86	30.41	3,756.75	1.44	586,564.64	465,566.11	
6,459.00	89.78	180.60	2,756.36	-713.64	-3,851.86	30.11	3,851.75	1.00	586,469.64	465,565.81	
6,553.00	89.78	182.67	2,756.72	-713.28	-3,945.82	27.43	3,945.71	2.20	586,375.68	465,563.13	
6,647.00	90.13	182.28	2,756.80	-713.20	-4,039.73	23.37	4,039.64	0.56	586,281.77	465,559.07	
6,741.00	90.40	181.72	2,756.36	-713.64	-4,133.67	20.09	4,133.59	0.66	586,187.83	465,555.79	
6,835.00	90.84	182.57	2,755.34	-714.66	-4,227.60	16.57	4,227.53	1.02	586,093.90	465,552.27	
6,928.00	91.28	183.38	2,753.62	-716.38	-4,320.46	11.75	4,320.40	0.99	586,001.04	465,547.45	
7,023.00	91.80	183.87	2,751.07	-718.93	-4,415.23	5.74	4,415.19	0.75	585,906.27	465,541.44	
7,078.00	91.80	183.87	2,749.34	-720.66	-4,470.08	2.03	4,470.05	0.00	585,851.42	465,537.73	

BHL-7078.00°MD,91.80°INC,183.87°AZI, 2749.34°TVD, 4470.05°VS, -4470.08°N, 2.03°E



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Wellbore: OH
Design: OH

Local Co-ordinate Reference: Well #1
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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(vt36) - survey misses target center by 15.95ft at 7078.00ft MD (2749.34 TVD, -4470.08 N, 2.03 E) - Point	0.00	360.00	2,750.00	-4,470.00	-13.90	585,851.500	465,521.800	32° 36' 38.017 N	104° 26' 43.093 W

Survey Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
7,078.00	2,749.34	-4,470.08	2.03	BHL-7078.00'MD,91.80°INC,183.87°AZI, 2749.34'TVD, 4470.05'VS, -4'

Checked By: _____ Approved By: _____ Date: _____