



Marbob
Eddy County
Crypt State
#1H
OH

Survey: MWD #1

Pathfinder X & Y Survey Report

21 July, 2010

PATHFINDER

3D-015-37973



Pathfinder

Pathfinder X & Y Survey Report



Company: Marathon
 Project: Eddy County
 Site: Crypt State
 Well: #1H
 Wellbore: OH
 Design: OH

Local Co-ordinate Reference: Well #1H
 TVD Reference: WELL @ 3423.50ft (12.5' KB Correction)
 MD Reference: WELL @ 3423.50ft (12.5' KB Correction)
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 Database: Midland Database

Project	Eddy County		
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 Crypt State

Site Position: Northing: 593,099.400 ft Latitude: 32° 37' 49.791 N
 From: Map Easting: 470,815.400 ft Longitude: 104° 25' 41.280 W
 Position Uncertainty: 0.00 ft Slot Radius: " Grid Convergence: -0.05 °

Well #1H

Well Position +N/-S 0.00 ft Northing: 593,099.400 ft Latitude: 32° 37' 49.791 N
 +E/-W 0.00 ft Easting: 470,815.400 ft Longitude: 104° 25' 41.280 W
 Position Uncertainty 0.00 ft Wellhead Elevation: ft Ground Level: 3,411.00 ft

Wellbore OH

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	07/16/2010	8.10	60.45	48,888

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	178.81

Survey Program Date 07/21/2010

From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
2,369.00	4,622.00	MWD #1 (OH)	MWD	MWD - Standard



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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)
2,300.00	0.28	273.05	2,299.43	-1,124.07	-41.83	-0.77	41.80	0.00	593,057.57	470,814.63
2,369.00	0.35	278.88	2,368.43	-1,055.07	-41.79	-1.15	41.76	0.11	593,057.61	470,814.25
2,401.00	0.79	193.73	2,400.43	-1,023.07	-41.99	-1.30	41.95	2.61	593,057.41	470,814.10
2,432.00	4.04	182.54	2,431.40	-992.10	-43.29	-1.39	43.25	10.54	593,056.11	470,814.01
2,464.00	8.18	180.55	2,463.21	-960.29	-46.69	-1.47	46.65	12.95	593,052.71	470,813.93
2,495.00	11.96	182.68	2,493.72	-929.78	-52.11	-1.64	52.06	12.25	593,047.29	470,813.76
2,527.00	15.83	185.34	2,524.78	-898.72	-59.77	-2.20	59.71	12.25	593,039.63	470,813.20
2,557.00	19.79	184.71	2,553.34	-870.16	-68.91	-3.00	68.83	13.22	593,030.49	470,812.40
2,588.00	23.04	178.99	2,582.20	-841.30	-80.21	-3.32	80.12	12.45	593,019.19	470,812.06
2,620.00	25.94	172.43	2,611.32	-812.18	-93.41	-2.29	93.34	12.41	593,005.99	470,813.11
2,651.00	29.63	173.03	2,638.74	-784.76	-107.74	-0.47	107.71	11.94	592,991.66	470,814.93
2,683.00	32.45	176.04	2,666.16	-757.34	-124.16	1.09	124.16	10.06	592,975.24	470,816.49
2,714.00	35.35	178.17	2,691.69	-731.61	-141.43	1.95	141.44	10.11	592,957.97	470,817.35
2,745.00	39.22	179.35	2,716.55	-706.95	-160.20	2.35	160.21	12.69	592,939.20	470,817.75
2,777.00	41.77	179.26	2,740.88	-682.62	-180.98	2.60	180.99	7.97	592,918.42	470,818.00
2,808.00	44.32	179.12	2,763.53	-659.97	-202.13	2.90	202.15	8.23	592,897.27	470,818.30
2,840.00	47.40	178.16	2,785.82	-637.68	-225.09	3.45	225.11	9.86	592,874.31	470,818.85
2,871.00	51.62	176.19	2,805.94	-617.56	-248.63	4.62	248.67	14.44	592,850.77	470,820.02
2,903.00	53.99	177.02	2,825.29	-598.21	-274.07	6.13	274.14	7.69	592,825.33	470,821.53
2,934.00	56.01	177.27	2,843.07	-580.43	-299.43	7.39	299.52	6.55	592,799.97	470,822.79
2,966.00	60.06	177.57	2,860.00	-563.50	-326.54	8.61	326.65	12.68	592,772.86	470,824.01
2,997.00	62.17	178.39	2,874.98	-548.52	-353.67	9.57	353.79	7.19	592,745.73	470,824.97
3,028.00	65.95	179.67	2,888.54	-534.96	-381.54	10.04	381.66	12.75	592,717.86	470,825.44
3,060.00	70.43	179.96	2,900.42	-523.08	-411.24	10.13	411.36	14.03	592,688.16	470,825.53
3,091.00	75.45	179.88	2,909.51	-513.99	-440.86	10.17	440.98	16.20	592,658.54	470,825.57
3,122.00	80.55	179.44	2,915.96	-507.54	-471.18	10.35	471.29	16.51	592,628.22	470,825.75
3,154.00	85.38	177.94	2,919.88	-503.62	-502.92	11.08	503.04	15.79	592,596.48	470,826.48



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3.166.00	86.97	176.83	2,922.01	-501.49	-534.81	12.54	534.96	6.06	592,564.59	470,827.94
3.250.00	88.50	177.72	2,924.54	-498.96	-598.69	15.58	598.88	2.77	592,500.71	470,830.96
3.374.00	89.78	177.73	2,926.40	-497.10	-722.57	20.50	722.84	1.03	592,376.63	470,835.90
3.468.00	89.78	177.72	2,926.76	-496.74	-816.50	24.23	816.82	0.01	592,282.90	470,839.63
3.593.00	90.13	177.72	2,926.86	-496.64	-941.40	29.20	941.60	0.28	592,158.00	470,844.60
3.718.00	90.04	177.83	2,926.67	-496.83	-1,066.30	34.06	1,066.78	0.11	592,033.10	470,849.46
3.842.00	90.13	178.32	2,926.49	-497.01	-1,190.23	38.22	1,190.77	0.40	591,909.17	470,853.62
3.999.00	90.57	179.32	2,925.53	-497.97	-1,347.19	41.46	1,347.76	0.70	591,752.21	470,856.66
4.154.00	90.92	179.36	2,923.52	-499.98	-1,502.17	43.24	1,502.74	0.23	591,597.23	470,858.64
4.279.00	90.48	178.06	2,921.99	-501.51	-1,627.13	46.05	1,627.73	1.10	591,472.27	470,861.45
4.374.00	90.75	178.09	2,920.97	-502.53	-1,722.07	49.25	1,722.72	0.29	591,377.33	470,864.65
4.469.00	89.67	178.23	2,920.62	-502.88	-1,817.02	52.30	1,817.71	1.15	591,262.38	470,867.70
4.562.00	89.60	178.36	2,921.21	-502.29	-1,909.97	55.06	1,910.71	0.16	591,189.43	470,870.46
4.622.00	89.69	179.02	2,921.58	-501.92	-1,969.96	56.43	1,970.70	1.11	591,129.44	470,871.83

BHL 4622.00' MD, 89.69° INC, 179.02° AZI, 2921.58' TVD, 1970.70' VS, -1969.96' N, 56.43' E

WHL 2310 FSL 330' FWL

BHL 340 FSL 386.4 FWL

Targets

Target Name

- hit/miss target	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
- Shape									
P&HL(CRYPT)	0.00	0.00	2,925.00	-1,979.80	41.10	591,119.600	470,856.500	32° 37' 30.200 N	104° 25' 40.778 W
- survey misses target center by 18.54ft at 4622.00ft MD (2921.58 TVD, -1969.96 N, 56.43 E)									
- Point									



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Survey Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N-S (ft)	+E-W (ft)	
4,622.00	2,921.58	-1,969.96	56.43	BHL-4622.00'MD,89.69°INC,179.02°AZI, 2921.58'TVD, 1970.70'VS, -1'

Checked By: _____ Approved By: _____ Date: _____