



Yates Petroleum Corp.

Eddy County
Cottonwood "KI" Federal Com #4H
#4H
OH

Survey: MWD #1

Pathfinder X & Y Survey Report

27 October, 2008

PATHFINDER
ENERGY SERVICES

30-015-34404



Pathfinder Energy Services
Pathfinder X & Y Survey Report



Company:	Yates Petroleum Corp.	Local Co-ordinate Reference:	Well #4H
Project:	Eddy County	TVD Reference:	WELL @ 3572.00ft (Original Well Elev)
Site:	Cottonwood "KI" Federal Com #4H	MD Reference:	WELL @ 3572.00ft (Original Well Elev)
Well:	#4H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 2003:16 Single-User Db

Project:	Eddy County	System Datum:	Mean Sea Level
Map System:	US State Plane 1983		
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		

Site:	Cottonwood "KI" Federal Com #4H		
Site Position:		Northing:	697,709.874 ft
From:	Map	Easting:	484,963.064 ft
Position Uncertainty:	0 00 ft	Slot Radius:	"
		Latitude:	32° 55' 4.383 N
		Longitude:	104° 31' 1.369 W
		Grid Convergence:	-0.10 °

Well	#4H					
Well Position	+N/-S	0 00 ft	Northing:	697,709.874 ft	Latitude:	32° 55' 4.383 N
	+E/-W	0.00 ft	Easting:	484,963.064 ft	Longitude:	104° 31' 1.369 W
Position Uncertainty		0 00 ft	Wellhead Elevation:	ft	Ground Level:	3,572.00ft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	08/07/2008	8.40	60.74	49.235

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	270.03	



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Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 2003.16 Single User Db

Survey Program		Date 10/27/2008			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
100.00	4,300.00	GYRO (OH)	MWD	MWD - Standard	
4,330.00	8,954.00	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)
4,300.00	2.06	37.30	4,299.58	727.58	44.88	19.59	-19.57	0.00	697,754.76	484,982.66
4,330.00	0.88	339.82	4,329.57	757.57	45.53	19.84	-19.82	5.84	697,755.40	484,982.90
4,361.00	4.04	286.10	4,360.54	788.54	46.05	18.71	-18.68	11.58	697,755.93	484,981.77
4,392.00	8.88	281.95	4,391.33	819.33	46.85	15.32	-15.29	15.68	697,756.73	484,978.38
4,423.00	13.54	281.32	4,421.73	849.73	48.06	9.41	-9.39	15.04	697,757.93	484,972.48
4,454.00	18.11	280.89	4,451.55	879.55	49.68	1.12	-1.09	14.75	697,759.56	484,964.18
4,485.00	22.16	279.92	4,480.65	908.65	51.60	-9.38	9.40	13.11	697,761.48	484,953.69
4,516.00	25.59	279.05	4,508.99	936.99	53.66	-21.75	21.78	11.12	697,763.54	484,941.31
4,547.00	28.93	279.15	4,536.55	964.55	55.91	-35.77	35.80	10.78	697,765.78	484,927.30
4,578.00	32.18	278.00	4,563.24	991.24	58.25	-51.35	51.38	10.65	697,768.12	484,911.71
4,609.00	35.26	276.40	4,589.02	1,017.02	60.40	-68.42	68.45	10.34	697,770.27	484,894.64
4,640.00	38.87	274.20	4,613.75	1,041.75	62.11	-87.02	87.05	12.40	697,771.98	484,876.04
4,670.00	41.94	272.46	4,636.60	1,064.60	63.23	-106.43	106.46	10.90	697,773.10	484,856.63
4,702.00	45.11	272.21	4,659.80	1,087.80	64.12	-128.45	128.48	9.92	697,774.00	484,834.62
4,733.00	48.28	272.12	4,681.06	1,109.06	64.98	-150.99	151.02	10.23	697,774.85	484,812.08
4,764.00	51.62	271.62	4,701.00	1,129.00	65.75	-174.70	174.74	10.84	697,775.62	484,788.36
4,795.00	56.10	271.47	4,719.28	1,147.28	66.42	-199.72	199.76	14.46	697,776.30	484,763.34
4,826.00	58.12	270.25	4,736.11	1,164.11	66.81	-225.75	225.78	7.31	697,776.68	484,737.32
4,857.00	60.59	271.22	4,751.91	1,179.91	67.15	-252.41	252.45	8.41	697,777.03	484,710.65
4,888.00	64.19	270.96	4,766.28	1,194.28	67.68	-279.87	279.91	11.64	697,777.55	484,683.19
4,919.00	68.41	270.81	4,778.73	1,206.73	68.11	-308.25	308.28	13.62	697,777.99	484,654.82



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Well:	#4H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 2003.16 Single User-Db

Survey											
MD (ft)	Inc (°)	Azi (°)	TVD (ft)	TVDSS (ft)	N/S (ft)	E/W (ft)	V. Sec (ft)	DLeg (°/100ft)	Northing (ft)	Easting (ft)	
4,950.00	71.49	270.34	4,789.36	1,217.36	68.40	-337.36	337.40	10.04	697,778.28	484,625.70	
4,981.00	74.74	269.78	4,798.36	1,226.36	68.43	-367.02	367.06	10.63	697,778.31	484,596.04	
5,012.00	78.52	269.64	4,805.53	1,233.53	68.28	-397.18	397.21	12.20	697,778.16	484,565.89	
5,043.00	82.57	269.64	4,810.62	1,238.62	68.09	-427.75	427.79	13.06	697,777.96	484,535.31	
5,074.00	85.03	269.97	4,813.97	1,241.97	67.98	-458.57	458.60	8.01	697,777.86	484,504.50	
5,128.00	90.04	270.75	4,816.29	1,244.29	68.32	-512.50	512.53	9.39	697,778.20	484,450.57	
5,190.00	90.31	271.37	4,816.10	1,244.10	69.47	-574.49	574.52	1.09	697,779.35	484,388.58	
5,252.00	89.87	270.67	4,816.00	1,244.00	70.57	-636.48	636.51	1.33	697,780.45	484,326.59	
5,314.00	89.78	269.76	4,816.19	1,244.19	70.81	-698.47	698.51	1.47	697,780.68	484,264.59	
5,407.00	89.16	269.94	4,817.05	1,245.05	70.56	-791.47	791.51	0.69	697,780.44	484,171.59	
5,500.00	89.69	269.29	4,817.99	1,245.99	69.94	-884.46	884.50	0.90	697,779.81	484,078.60	
5,592.00	91.89	268.54	4,816.72	1,244.72	68.20	-976.43	976.47	2.53	697,778.07	483,986.63	
5,654.00	90.92	268.01	4,815.20	1,243.20	66.33	-1,038.38	1,038.42	1.78	697,776.21	483,924.68	
5,749.00	88.20	266.32	4,815.93	1,243.93	61.63	-1,133.25	1,133.28	3.37	697,771.51	483,829.81	
5,845.00	89.69	266.28	4,817.70	1,245.70	55.44	-1,229.03	1,229.06	1.55	697,765.31	483,734.03	
5,940.00	90.66	266.00	4,817.41	1,245.41	49.04	-1,323.82	1,323.84	1.06	697,758.92	483,639.25	
6,003.00	89.25	264.98	4,817.46	1,245.46	44.09	-1,386.62	1,386.64	2.76	697,753.97	483,576.45	
6,067.00	91.80	265.32	4,816.87	1,244.87	38.68	-1,450.38	1,450.40	4.02	697,748.55	483,512.68	
6,130.00	91.98	265.49	4,814.79	1,242.79	33.64	-1,513.14	1,513.16	0.39	697,743.51	483,449.92	
6,194.00	90.92	265.07	4,813.17	1,241.17	28.37	-1,576.91	1,576.92	1.78	697,738.25	483,386.16	
6,257.00	90.04	264.71	4,812.64	1,240.64	22.76	-1,639.65	1,639.66	1.51	697,732.63	483,323.41	
6,289.00	89.25	264.15	4,812.84	1,240.84	19.66	-1,671.50	1,671.51	3.03	697,729.53	483,291.56	
6,385.00	92.24	265.34	4,811.59	1,239.59	10.86	-1,767.08	1,767.08	3.35	697,720.74	483,195.99	
6,448.00	91.01	264.52	4,809.81	1,237.81	5.30	-1,829.80	1,829.80	2.35	697,715.17	483,133.26	
6,512.00	88.99	262.85	4,809.81	1,237.81	-1.74	-1,893.41	1,893.41	4.10	697,708.13	483,069.66	
6,607.00	92.51	263.44	4,808.56	1,236.56	-13.08	-1,987.71	1,987.70	3.76	697,696.80	482,975.36	
6,702.00	91.36	263.23	4,805.36	1,233.36	-24.10	-2,082.01	2,082.00	1.23	697,685.78	482,881.06	



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Well:	#4H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 2003.16 Single User Db

Survey											
MD (ft)	Inc (°)	Azi (°)	TVD (ft)	TVDSS (ft)	N/S (ft)	E/W (ft)	V. Sec (ft)	DLeg (°/100ft)	Northing (ft)	Easting (ft)	
6,798.00	93.12	265.86	4,801.60	1,229.60	-33.22	-2,177.49	2,177.47	3.29	697,676.66	482,785.58	
6,894.00	92.68	269.17	4,796.75	1,224.75	-37.37	-2,273.26	2,273.24	3.47	697,672.50	482,689.80	
6,957.00	92.77	269.66	4,793.75	1,221.75	-38.01	-2,336.19	2,336.17	0.79	697,671.86	482,626.88	
7,021.00	91.80	269.51	4,791.20	1,219.20	-38.48	-2,400.13	2,400.11	1.53	697,671.40	482,562.93	
7,116.00	91.98	271.70	4,788.07	1,216.07	-37.47	-2,495.07	2,495.05	2.31	697,672.40	482,467.99	
7,179.00	90.92	271.33	4,786.47	1,214.47	-35.81	-2,558.03	2,558.01	1.78	697,674.06	482,405.04	
7,242.00	89.78	270.56	4,786.09	1,214.09	-34.77	-2,621.02	2,621.00	2.18	697,675.10	482,342.05	
7,337.00	91.71	273.01	4,784.85	1,212.85	-31.81	-2,715.95	2,715.93	3.28	697,678.06	482,247.11	
7,433.00	90.92	273.28	4,782.65	1,210.65	-26.55	-2,811.78	2,811.77	0.87	697,683.33	482,151.28	
7,528.00	90.22	273.18	4,781.70	1,209.70	-21.19	-2,906.62	2,906.61	0.74	697,688.68	482,056.44	
7,623.00	88.46	272.30	4,782.80	1,210.80	-16.65	-3,001.50	3,001.49	2.07	697,693.22	481,961.56	
7,718.00	91.45	272.82	4,782.87	1,210.87	-12.41	-3,096.40	3,096.39	3.19	697,697.46	481,866.67	
7,813.00	91.54	272.97	4,780.39	1,208.39	-7.61	-3,191.24	3,191.24	0.18	697,702.26	481,771.82	
7,908.00	90.40	272.81	4,778.78	1,206.78	-2.83	-3,286.11	3,286.11	1.21	697,707.05	481,676.96	
7,972.00	89.87	272.94	4,778.63	1,206.63	0.38	-3,350.03	3,350.03	0.85	697,710.26	481,613.04	
8,067.00	92.77	273.50	4,776.45	1,204.45	5.72	-3,444.84	3,444.84	3.11	697,715.59	481,518.22	
8,162.00	92.95	273.49	4,771.71	1,199.71	11.50	-3,539.55	3,539.55	0.19	697,721.38	481,423.52	
8,257.00	91.98	273.17	4,767.62	1,195.62	17.02	-3,634.30	3,634.31	1.08	697,726.89	481,328.77	
8,352.00	90.92	272.49	4,765.22	1,193.22	21.70	-3,729.15	3,729.16	1.33	697,731.58	481,233.91	
8,448.00	90.31	272.55	4,764.19	1,192.19	25.92	-3,825.05	3,825.06	0.64	697,735.80	481,138.01	
8,543.00	90.22	272.87	4,763.75	1,191.75	30.42	-3,919.94	3,919.96	0.35	697,740.29	481,043.12	
8,638.00	89.43	272.88	4,764.04	1,192.04	35.18	-4,014.82	4,014.84	0.83	697,745.06	480,948.24	
8,734.00	91.45	272.04	4,763.30	1,191.30	39.30	-4,110.73	4,110.75	2.28	697,749.18	480,852.34	
8,829.00	91.63	271.60	4,760.75	1,188.75	42.32	-4,205.64	4,205.66	0.50	697,752.19	480,757.42	
8,890.00	89.96	270.54	4,759.90	1,187.90	43.46	-4,266.62	4,266.65	3.24	697,753.33	480,696.44	
8,954.00	89.96	270.54	4,759.94	1,187.94	44.06	-4,330.62	4,330.64	0.00	697,753.93	480,632.44	
Projection to Bit @ 8954' MD											



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Pathfinder X & Y Survey Report



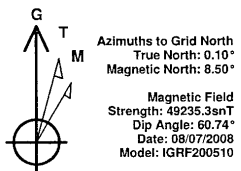
Company:	Yates Petroleum Corp.	Local Co-ordinate Reference:	Well #4H
Project:	Eddy County	TVD Reference:	WELL @ 3572.00ft (Original Well Elev)
Site:	Cottonwood "KI" Federal Com #4H	MD Reference:	WELL @ 3572.00ft (Original Well Elev)
Well:	#4H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 2003.16 Single User Db

Targets									
Target Name	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
hit/miss target	(°)	(°)	(ft)	(ft)	(ft)	(ft)	(ft)		
Shape									
PP(CW#4H)	0.00	0.00	4,886.00	0.00	-400.00	697,709.874	484,563.064	32° 55' 4.376 N	104° 31' 6.062 W
- survey misses by 104.08ft at 5028.43ft MD (4808.50 TVD, 68.18 N, -413.34 E)									
- Point									
PBHL(CW#4H)	0.00	0.00	4,810.00	2.30	-4,390.23	697,712.173	480,572.838	32° 55' 4.327 N	104° 31' 52.874 W
- survey misses by 88.33ft at 8954.00ft MD (4759.94 TVD, 44.06 N, -4330.62 E)									
- Point									
Landing Point(CW#4H)	0.00	0.00	4,886.30	0.25	-486.80	697,710.124	484,476.264	32° 55' 4.377 N	104° 31' 7.080 W
- survey misses by 97.82ft at 5104.90ft MD (4815.88 TVD, 68.09 N, -489.41 E)									
- Point									

Survey Annotations				
Measured Depth	Vertical Depth	Local Coordinates		Comment
(ft)	(ft)	+N/-S (ft)	+E/-W (ft)	
8,954.00	4,759.94	44.06	-4,330.62	Projection to Bit @ 8954' MD

Checked By: _____ Approved By: _____ Date: _____

Yates Petroleum Corporation



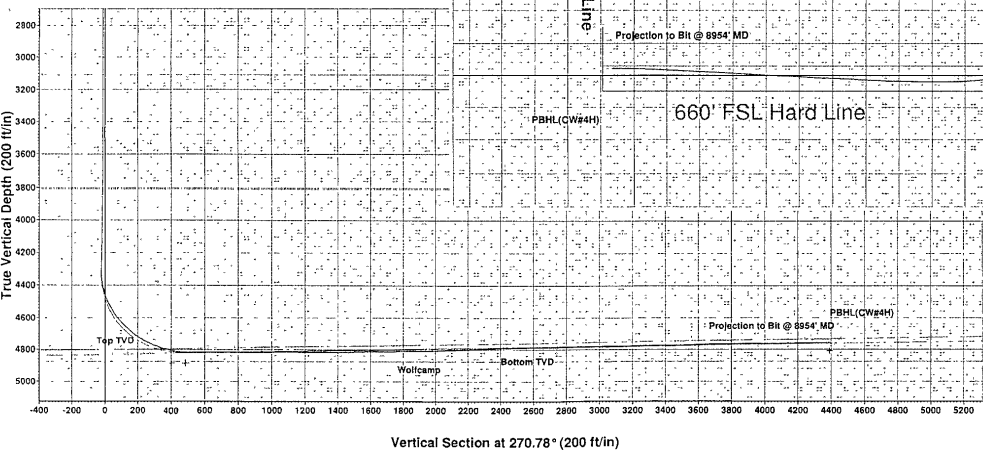
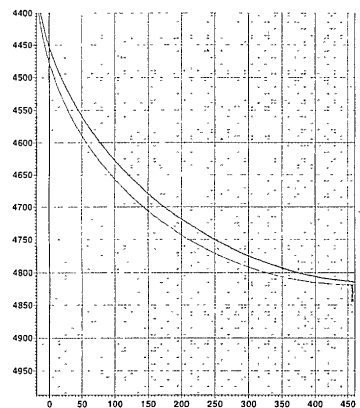
EOW

WELL DETAILS: #4H						
Ground Elevation: 3572.00						
RKB Elevation: WELL @ 3572.00ft (Original Well Elev)						
Rig Name: Original Well Elev						
+N-S	+E-W	Northing	Easting	Latitude	Longitude	Slot
0.00	0.00	697709.874	484563.064	32° 55' 4.389 N	104° 31' 1.389 W	

WELLBORE TARGET DETAILS (MAP CO-ORDINATES)						
Name	TVD	+N-S	+E-W	Northing	Easting	Shape
PBHL(CW#4H)	4810.00	2.30	-4390.23	697712.173	480572.838	Point
PP(CW#4H)	4806.30	0.00	-400.00	697709.874	484563.064	Point
Landing Point(CW#4H)	4806.30	0.25	-466.80	697710.124	484476.264	Point

SECTION DETAILS										
Sec	MD	Inc	Azi	TVD	+N-S	+E-W	DLeg	TFace	VSec	Target
1	4332.00	1.77	41.31	4331.56	45.71	20.27	0.00	0.00	-19.64	
2	5089.14	90.89	270.03	4818.55	57.44	-464.51	12.00	-131.24	465.24	
3	9024.55	90.89	270.03	4757.58	59.50	-4389.45	0.00	0.00	4389.65	PBHL(CW#4H)

Project: Eddy County
Site: Cottonwood "KI" Federal Com #4H
Well: #4H
Wellbore: OH
Plan: Plan #2 (#4H/OH)



PROJECT DETAILS: Eddy County				
Geodetic System: US State Plane 1983				
Datum: North American Datum 1983				
Ellipsoid: GRS 1980				
Zone: New Mexico Eastern Zone				
System Datum: Mean Sea Level				
Local North: Grid				

Plan: Plan #2 (#4H/OH)		
Created By: Nate Singham Date: 8/22, October 27 2008		
Checked: _____	Date: _____	