



EOG Resources - Midland

Lea County, NM (NAD 83 NME)

Hearns 34 State

#406H

OH

Design: OH

Final PVA Report

23 April, 2019

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Final PVA Report

Company:	EOG Resources - Midland	Local Co-ordinate Reference:	Well #406H
Project:	Lea County, NM (NAD 83 NME)	TVD Reference:	KB = 25 @ 3510.0usft
Site:	Hearns 34 State	MD Reference:	KB = 25 @ 3510.0usft
Well:	#406H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.14

Project	Lea County, NM (NAD 83 NME)		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		

Site	Hearns 34 State		
Site Position:		Northing:	425,605.00 usft
From:	Map	Easting:	782,931.00 usft
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 10' 3.563 N
		Longitude:	103° 33' 9.201 W
		Grid Convergence:	0.42 °

Well	#406H		
Well Position	+N/-S	0.0 usft	Northing:
	+E/-W	0.0 usft	Easting:
Position Uncertainty	0.0 usft		Wellhead Elevation:
			usft
			Latitude:
			Longitude:
			Ground Level:
			3,485.0 usft

Wellbore	OH		
Magnetics	Model Name	Sample Date	Declination
	IGRF2015	2/5/2019	6.76
			Dip Angle
			59.99
			Field Strength
			47,737.83301131

Design	OH		
Audit Notes:			
Version:	1.0	Phase:	ACTUAL
		Tie On Depth:	0.0
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W
	(usft)	(usft)	(usft)
	0.0	0.0	0.0
			Direction
			358.46

Survey Program	Date 4/23/2019		
From	To	Survey (Wellbore)	Tool Name
(usft)	(usft)		Description
144.0	15,079.0	Intrepid MWD #1 (OH)	MWD
			OWSG MWD - Standard



Final PVA Report

Company: EOG Resources - Midland
 Project: Lea County, NM (NAD 83 NME)
 Site: Hearn 34 State
 Well: #406H
 Wellbore: OH
 Design: OH

Local Co-ordinate Reference: Well #406H
 TVD Reference: KB = 25 @ 3510.0usft
 MD Reference: KB = 25 @ 3510.0usft
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 Database: EDM 5000.14

Survey											
MD (usft)	Inc (")	Azi (grid_north_azim)	TVD (usft)	N/S (usft)	E/W (usft)	DLeg ("/100usft)	Build ("/100usft)	Turn ("/100usft)	High to Plan (usft)	Right to Plan (usft)	
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0.0	0.0
144.0	0.50	89.00	144.0	0.2	0.6	0.35	0.35	0.00	-0.6	0.0	
332.0	0.60	161.20	332.0	-0.4	1.7	0.42	0.05	49.04	-0.9	1.4	
510.0	0.60	173.00	510.0	-2.2	2.1	0.07	0.00	6.63	-2.5	1.8	
699.0	0.60	256.60	699.0	-3.4	1.2	0.42	0.00	44.23	0.4	3.6	
888.0	1.20	297.20	888.0	-2.8	-1.5	0.44	0.32	21.48	-0.1	3.1	
1,076.0	1.70	316.80	1,075.9	0.2	-5.1	0.37	0.27	10.43	-3.6	3.6	
1,252.0	1.10	326.40	1,251.8	3.5	-7.9	0.36	-0.34	5.45	-7.3	4.6	
1,441.0	0.70	331.00	1,440.8	6.0	-9.4	0.21	-0.21	2.43	-9.8	5.3	
1,630.0	1.00	115.30	1,629.8	6.3	-8.5	0.86	0.16	76.35	10.4	2.1	
1,818.0	1.50	106.80	1,817.8	4.9	-4.7	0.28	0.27	-4.52	5.9	3.3	
2,007.0	1.00	120.60	2,006.7	3.3	-0.9	0.31	-0.26	7.30	2.5	2.4	
2,195.0	0.30	102.60	2,194.7	2.4	1.0	0.38	-0.37	-9.57	-0.5	2.6	
2,383.0	0.20	157.50	2,382.7	2.0	1.6	0.13	-0.05	29.20	1.2	2.3	
2,572.0	0.40	263.70	2,571.7	1.6	1.1	0.26	0.11	56.19	1.3	-1.5	
2,760.0	0.60	291.50	2,759.7	1.9	-0.5	0.16	0.11	14.79	-1.1	-1.6	
2,949.0	0.40	341.50	2,948.7	2.9	-1.6	0.24	-0.11	26.46	-3.3	0.6	
3,138.0	0.80	350.40	3,137.7	4.8	-2.0	0.22	0.21	4.71	-5.1	1.2	
3,326.0	0.80	15.60	3,325.7	7.4	-1.9	0.19	0.00	13.40	-6.6	3.6	
3,514.0	1.10	43.30	3,513.6	10.0	-0.3	0.29	0.16	14.73	-7.0	7.0	
3,703.0	1.10	41.90	3,702.6	12.6	2.2	0.01	0.00	-0.74	-10.8	6.8	
3,892.0	0.60	45.30	3,891.8	14.7	4.1	0.27	-0.28	1.80	-13.2	7.6	
4,081.0	1.00	84.90	4,080.6	15.5	6.4	0.35	0.21	20.95	-7.8	14.9	
4,270.0	0.40	101.30	4,269.5	15.5	8.7	0.33	-0.32	8.68	-5.5	16.9	
4,458.0	0.70	126.90	4,457.5	14.7	10.3	0.20	0.16	13.62	0.8	17.9	
4,647.0	2.40	120.30	4,646.5	12.0	14.6	0.90	0.90	-3.49	-6.5	17.8	
4,835.0	3.20	133.00	4,834.2	6.5	21.8	0.54	0.43	6.76	-11.6	19.6	



Final PVA Report

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Project:	Lea County, NM (NAD 83 NME)	TVD Reference:	KB = 25 @ 3510.0usft
Site:	Hearns 34 State	MD Reference:	KB = 25 @ 3510.0usft
Well:	#406H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.14

MD (usft)	Inc (°)	Azi (grid_north_azim)	TVD (usft)	N/S (usft)	E/W (usft)	DLeg (°/100usft)	Build (°/100usft)	Turn (°/100usft)	High to Plan (usft)	Right to Plan (usft)
5,006.0	4.10	135.30	5,004.9	-1.1	29.6	0.53	0.53	1.35	-21.6	20.3
5,206.0	3.50	131.10	5,204.4	-10.2	39.3	0.33	-0.30	-2.10	-32.3	22.1
5,395.0	5.20	141.90	5,392.9	-20.8	48.9	0.99	0.90	5.71	-27.4	38.4
5,583.0	7.00	147.40	5,579.8	-37.1	60.3	1.01	0.98	2.93	-26.2	51.0
5,772.0	8.30	165.90	5,767.2	-60.1	69.9	1.46	0.69	9.79	-13.8	63.7
5,960.0	11.30	187.00	5,952.5	-91.5	70.9	2.46	1.60	11.22	-2.2	65.4
6,148.0	9.90	195.90	6,137.3	-125.4	64.2	1.14	-0.74	4.73	-8.2	61.0
6,337.0	9.80	194.90	6,323.5	-156.2	55.7	0.18	-0.16	-0.53	-22.6	54.1
6,525.0	9.80	200.00	6,508.9	-188.1	46.3	0.45	0.00	2.71	-31.2	49.2
6,714.0	8.90	205.00	6,695.5	-214.1	34.8	0.56	-0.37	2.65	-40.0	43.4
6,902.0	5.70	213.40	6,881.9	-235.1	23.5	1.79	-1.70	4.47	-41.4	38.9
7,091.0	4.00	241.00	7,070.2	-248.2	12.6	1.50	-0.90	14.60	-25.4	40.0
7,280.0	2.20	26.50	7,259.1	-248.1	8.4	3.15	-0.95	76.98	26.4	-4.9
7,468.0	1.70	21.00	7,447.0	-240.3	11.0	0.28	-0.27	-2.93	4.8	5.7
7,657.0	1.80	23.40	7,635.9	-235.2	13.1	0.06	-0.05	1.27	-10.3	10.9
7,846.0	1.10	10.30	7,824.9	-231.0	14.4	0.31	-0.26	-6.93	-17.8	7.9
8,035.0	1.00	15.40	8,013.8	-227.7	15.2	0.07	-0.05	2.70	-20.5	9.6
8,223.0	1.00	18.40	8,201.8	-224.5	16.2	0.03	0.00	1.60	-23.3	10.7
8,412.0	0.60	39.40	8,390.8	-222.2	17.3	0.26	-0.21	11.11	-20.4	18.0
8,601.0	0.40	151.10	8,579.8	-222.0	18.3	0.44	-0.11	59.10	24.9	12.9
8,790.0	0.70	186.50	8,768.8	-223.7	18.4	0.23	0.16	18.73	26.0	-3.5
8,978.0	0.70	186.90	8,956.8	-226.0	18.2	0.00	0.00	0.21	23.7	-3.7
9,167.0	0.70	191.20	9,145.8	-226.3	17.8	0.03	0.00	2.28	21.1	-5.4
9,356.0	0.30	202.20	9,334.8	-229.9	17.4	0.22	-0.21	5.82	18.0	-9.1
9,544.0	0.10	283.30	9,522.7	-230.3	17.1	0.16	-0.11	43.14	-6.4	-18.7
9,734.0	1.50	359.40	9,712.7	-227.8	16.9	0.78	0.74	40.05	-22.2	1.9
9,922.0	1.70	19.90	9,900.7	-222.7	17.8	0.32	0.11	10.80	-25.3	10.4



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Well:	#406H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.14

Survey

MD (usft)	Inc (")	Azi (grid_north_azim)	TVD (usft)	N/S (usft)	E/W (usft)	DLeg ("/100usft)	Build ("/100usft)	Turn ("/100usft)	High to Plan (usft)	Right to Plan (usft)
10,042.0	2.30	19.50	10,020.6	-218.7	19.2	0.50	0.50	-0.33	-29.5	10.3
10,081.4	7.00	7.33	10,089.8	-214.8	19.9	9.67	9.52	-24.61	-35.0	3.6
KOP (Hearns 34 State #406H)										
10,136.0	11.30	5.10	10,113.8	-207.8	20.6	9.67	9.64	-5.01	-40.8	1.7
10,231.0	24.10	5.20	10,204.1	-179.1	23.2	13.47	13.47	0.11	-55.0	-2.3
10,326.0	31.20	4.70	10,288.2	-135.2	27.0	7.48	7.47	-0.53	-68.8	-11.2
10,420.0	37.00	4.00	10,386.0	-82.6	31.0	6.18	6.17	-0.74	-75.8	-24.0
10,515.0	44.90	356.40	10,437.8	-20.5	30.9	9.82	8.32	-8.00	-72.4	-42.4
10,523.8	45.80	355.79	10,443.8	-14.4	30.5	11.63	10.49	-7.07	-71.8	-43.6
FTP (Hearns 34 State #406H)										
10,609.0	54.90	350.60	10,498.3	50.7	22.5	11.63	10.65	-6.08	-66.3	-50.0
10,703.0	64.60	346.80	10,545.6	130.2	6.5	10.89	10.32	-4.04	-61.1	-47.8
10,795.0	69.40	346.30	10,581.5	212.6	-13.2	5.24	5.22	-0.54	-52.4	-40.5
10,890.0	79.20	347.20	10,607.2	301.5	-34.1	10.36	10.32	0.95	-39.0	-32.6
10,890.4	79.20	347.20	10,607.3	301.9	-34.2	0.00	0.00	0.00	-39.0	-32.6
50' HL Crossing, MD:10890.4", TVD:10607.3", N/S:301.9", E/W:-34.2", INC:79.20										
10,985.0	79.50	347.10	10,624.8	392.5	-54.9	0.33	0.32	-0.11	-20.6	-24.5
11,080.0	83.90	348.10	10,638.5	484.3	-75.1	4.75	4.63	1.05	-5.7	-11.0
11,174.0	89.30	351.20	10,644.1	576.6	-91.9	6.62	5.74	3.30	1.3	4.2
11,268.0	91.50	354.20	10,643.4	669.8	-103.9	3.98	2.34	3.19	2.2	15.4
11,362.0	91.90	358.00	10,640.6	763.5	-110.3	4.06	0.43	4.04	0.9	21.0
11,457.0	93.70	358.80	10,636.0	858.3	-112.9	2.07	1.89	0.84	-2.1	22.9
11,552.0	91.40	359.40	10,631.7	953.2	-114.4	2.50	-2.42	0.63	-4.8	23.5
11,646.0	91.30	1.10	10,629.5	1,047.2	-114.0	1.81	-0.11	1.81	-5.5	22.3
11,741.0	93.40	0.70	10,625.6	1,142.1	-112.5	2.25	2.21	-0.42	-7.9	20.0
11,835.0	91.00	1.70	10,622.0	1,236.0	-110.5	2.77	-2.55	1.06	-9.9	17.3
11,930.0	88.50	1.40	10,622.4	1,331.0	-108.0	2.65	-2.63	-0.32	-7.9	13.9



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Site:	Hearns 34 State	MD Reference:	KB = 25 @ 3510.0usft
Well:	#406H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000.14

Survey											
MD (usft)	Inc (°)	Azi (grid_north_azim)	TVD (usft)	N/S (usft)	EAH (usft)	DLeg (°/100usft)	Build (°/100usft)	Turn (°/100usft)	High to Plan (usft)	Right to Plan (usft)	
12,024.0	88.80	1.40	10,624.6	1,424.9	-105.7	0.32	0.32	0.00	-4.2	10.8	
12,119.0	90.70	1.10	10,625.1	1,519.9	-103.6	2.02	2.00	-0.32	-2.2	8.0	
12,197.3	91.87	1.10	10,623.3	1,598.1	-102.1	1.49	1.49	0.00	-2.7	5.8	
TGT 1 (Hearns 34 State #406H)											
12,213.0	92.10	1.10	10,622.8	1,613.8	-101.8	1.49	1.49	0.00	-3.0	5.4	
12,307.0	93.50	0.60	10,618.2	1,707.7	-100.4	1.58	1.49	-0.53	-8.0	3.2	
12,402.0	91.30	1.50	10,614.2	1,802.6	-98.7	2.50	-2.32	0.95	-8.4	0.6	
12,496.0	93.20	2.50	10,610.5	1,896.5	-95.4	2.28	2.02	1.06	-10.5	-3.4	
12,590.0	88.20	0.40	10,609.4	1,990.4	-93.0	5.77	-5.32	-2.23	-10.0	-8.6	
12,685.0	87.40	359.60	10,613.0	2,085.3	-93.0	1.19	-0.84	-0.84	-4.8	-7.4	
12,780.0	87.80	359.70	10,617.0	2,180.2	-93.6	0.43	0.42	0.11	0.8	-7.6	
12,874.0	88.00	359.60	10,620.4	2,274.2	-94.2	0.24	0.21	-0.11	5.8	-7.8	
12,969.0	88.40	359.50	10,623.4	2,369.1	-94.9	0.43	0.42	-0.11	10.4	-7.9	
13,063.0	89.20	359.60	10,625.4	2,463.1	-95.6	0.86	0.85	0.11	13.9	-8.0	
13,158.0	88.80	359.00	10,627.0	2,558.1	-96.8	0.78	-0.42	-0.63	17.2	-7.6	
13,252.0	90.70	359.80	10,627.4	2,652.1	-97.8	2.19	2.02	0.85	19.2	-7.4	
13,347.0	94.10	0.30	10,623.5	2,747.0	-97.7	3.62	3.58	0.53	16.8	-8.3	
13,441.0	90.20	0.30	10,619.9	2,840.9	-97.2	4.15	-4.15	0.00	14.8	-9.6	
13,448.6	90.37	0.30	10,619.9	2,848.5	-97.2	2.21	2.21	0.00	14.9	-9.7	
TGT 2 (Hearns 34 State #406H)											
13,536.0	92.30	0.30	10,617.9	2,935.8	-96.7	2.21	2.21	0.00	13.8	-10.9	
13,630.0	88.10	359.00	10,617.5	3,029.8	-97.3	4.66	-4.47	-1.38	14.4	-11.1	
13,724.0	89.20	359.00	10,619.8	3,123.8	-98.9	1.17	1.17	0.00	17.5	-10.2	
13,819.0	90.30	359.20	10,620.2	3,218.8	-100.4	1.18	1.16	0.21	18.9	-9.6	
13,913.0	90.10	357.00	10,619.8	3,312.7	-103.5	2.35	-0.21	-2.34	19.5	-7.2	
14,007.0	92.00	357.20	10,618.1	3,406.6	-108.3	2.03	2.02	0.21	18.7	-3.3	
14,101.0	90.70	357.10	10,615.9	3,500.4	-113.0	1.39	-1.38	-0.11	17.4	0.6	



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Well:	#406H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
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Survey											
MD (usft)	Inc (°)	Azi (grid_north_azim)	TVD (usft)	N/S (usft)	E/W (usft)	DLog (°/100usft)	Build (°/100usft)	Turn (°/100usft)	High to Plan (usft)	Right to Plan (usft)	
14,196.0	90.80	357.20	10,614.7	3,595.3	-117.7	0.15	0.11	0.11	17.0	4.5	
14,290.0	92.10	357.40	10,612.3	3,689.2	-122.1	1.40	1.38	0.21	15.6	8.2	
14,384.0	90.10	358.10	10,610.5	3,783.1	-125.8	2.25	-2.13	0.74	14.7	11.1	
14,478.0	90.30	358.70	10,610.2	3,877.0	-128.4	0.67	0.21	0.64	15.3	12.9	
14,572.0	91.20	358.60	10,608.9	3,971.0	-130.6	0.96	0.96	-0.11	15.0	14.3	
14,667.0	91.10	356.90	10,607.0	4,065.9	-134.4	1.79	-0.11	-1.79	14.0	17.2	
14,761.0	90.80	358.70	10,605.5	4,159.8	-138.0	1.94	-0.32	1.91	13.4	20.1	
14,856.0	91.10	359.80	10,603.9	4,254.8	-139.2	1.20	0.32	1.16	12.7	20.5	
14,950.0	91.80	359.30	10,601.5	4,348.8	-140.0	0.92	0.74	-0.53	11.2	20.4	
15,018.0	93.40	359.20	10,598.4	4,416.7	-140.8	2.36	2.35	-0.15	8.8	20.8	
Final MWD Survey (MD=15018.0')											
15,079.0	93.40	359.20	10,594.8	4,477.6	-141.7	0.00	0.00	0.00	5.8	21.1	
Final Projection to Bit (MD=15079.0') - PBHL (Hearns 34 State #406H)											

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/S (usft)	+E/W (usft)	
10,890.4	10,607.3	301.9	-34.2	50' HL Crossing, MD:10890.4', TVD:10607.3', N/S:301.9', E/W:-34.2', INC:79.20
15,018.0	10,598.4	4,416.7	-140.8	Final MWD Survey (MD=15018.0')
15,079.0	10,594.8	4,477.6	-141.7	Final Projection to Bit (MD=15079.0')

Checked By: _____ Approved By: _____ Date: _____



Lea County, NM (NAD 83 NME)

Hearns 34 State #406H

Plan #2

PROJECT DETAILS: Lea County, NM (NAD 83 NME)

Geodetic System: US State Plane 1983
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone: New Mexico Eastern Zone
System Datum: Mean Sea Level

WELL DETAILS: #406H

KB = 25 @ 3510.00ft
Northing 425603.00 Easting 782964.00 Latitude 32° 10' 3.583 N Longitude 103° 33' 5.917 W

To convert a Magnetic Direction to a Grid Direction, Add 6.30°
To convert a Magnetic Direction to a True Direction, Add 6.70° East
To convert a True Direction to a Grid Direction, Subtract 0.42°

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N-S	+E-W	Dlog	TFace	Vsect
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0
2	5025.0	0.00	0.00	5025.0	0.0	0.0	0.00	0.00	0.0
3	5325.0	6.00	175.65	5324.4	-15.6	1.2	2.00	175.65	-15.7
4	7423.6	6.00	175.65	7411.6	-234.4	17.8	0.00	0.00	-234.8
5	7723.6	0.00	359.78	7711.0	-250.0	19.0	2.00	180.00	-250.4
6	10086.6	0.00	359.78	10074.0	-250.0	19.0	0.00	0.00	-250.4
7	10996.0	90.94	351.17	10646.9	325.5	-70.4	10.00	351.17	327.2
8	11204.6	90.94	359.52	10643.5	533.2	-87.3	4.00	89.94	535.4
9	12269.7	90.94	359.52	10626.0	1598.1	-98.3	0.00	0.00	1600.1
10	12270.9	90.96	359.52	10626.0	1599.3	-98.3	2.00	-1.51	1601.3
11	13520.0	90.96	359.52	10605.0	2848.2	-106.8	0.00	0.00	2850.0
12	13540.2	90.56	359.52	10604.7	2868.3	-107.0	2.00	-179.99	2870.2
13	15150.0	90.56	359.52	10589.0	4478.0	-120.6	0.00	0.00	4479.7

WELLBORE YARDY DETAILS (MAP CO-ORDINATES)

Name	TVD	+N-S	+E-W	Northing	Easting
KOP (Hearns 34 State #406H)	10074.0	-250.0	19.0	425355.00	782983.00
PBRL (Hearns 34 State #406H)	10538.0	4478.0	-120.6	430083.00	782943.40
TOT 2 (Hearns 34 State #406H)	19626.0	2848.2	-106.8	428483.30	78287.18
TOT 1 (Hearns 34 State #406H)	10626.0	1638.1	-98.3	427203.10	78287.71
FTP (Hearns 34 State #406H)	10647.0	-200.0	-81.0	425405.00	782983.00

