



30-025-43893

EOG Resources - Midland

Lea County, NM (NAD 83 NME)

Ruby 2 State Com

#703H

OH

Survey: Intrepid MWD

Midland PVA

15 September, 2017

HOBBS OCD
JAN 31 2018
RECEIVED

Company:	EOG Resources - Midland	Local Co-ordinate Reference:	Well #703H
Project:	Lea County, NM (NAD 83 NME)	TVD Reference:	KB = 25' @ 3330.0usft (HP 642)
Site:	Ruby 2 State Com	MD Reference:	KB = 25' @ 3330.0usft (HP 642)
Well:	#703H	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	Ruby 2 State Com		
Site Position:		Northing:	393,589.99 usft
From:	Map	Easting:	775,148.00 usft
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 4' 47.315 N
		Longitude:	103° 34' 42.355 W
		Grid Convergence:	0.40 °

Well		#703H				
Well Position	+N/-S	0.0 usft	Northing:	393,647.00 usft	Latitude:	32° 4' 44.773 N
	+E/-W	0.0 usft	Easting:	816,370.00 usft	Longitude:	103° 26' 43.260 W
Position Uncertainty	0.0 usft	Wellhead Elevation:	0.0 usft	Ground Level:	3,305.0 usft	

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	1/23/2017	6.93	59.95	47,906.91007229

Design	OH				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.0	0.0	0.0	174.53	



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Survey Program Date 9/15/2017

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
131.0	997.0	Invictus MWD (OH)	MWD	MWD - Standard
1,051.0	17,561.0	Intrepid MWD (OH)	MWD	MWD - Standard

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	DLeg (°/100usft)	Build (°/100usft)	Turn (°/100usft)	High to Plan (usft)	Right to Plan (usft)
997.0	0.20	255.43	997.0	-2.9	-4.2	0.00	0.00	0.00	-4.8	1.8
1,051.0	0.30	283.43	1,051.0	-2.9	-4.4	0.29	0.19	51.85	-3.6	3.9
1,242.0	0.60	267.80	1,242.0	-2.8	-5.9	0.17	0.16	-8.18	-6.0	2.6
1,428.0	0.70	262.80	1,427.9	-3.0	-8.0	0.06	0.05	-2.69	-8.3	2.0
1,615.0	0.80	261.20	1,614.9	-3.4	-10.4	0.05	0.05	-0.86	-10.8	1.7
1,803.0	0.70	269.80	1,802.9	-3.6	-12.9	0.08	-0.05	4.57	-12.9	3.5
1,990.0	0.70	290.00	1,989.9	-3.2	-15.1	0.13	0.00	10.80	-13.1	8.2
2,177.0	0.70	278.00	2,176.9	-2.6	-17.3	0.08	0.00	-6.42	-16.8	5.0
2,365.0	0.70	282.50	2,364.9	-2.2	-19.6	0.03	0.00	2.39	-18.6	6.4
2,552.0	0.50	305.70	2,551.9	-1.5	-21.3	0.17	-0.11	12.41	-16.5	13.7
2,741.0	0.50	5.70	2,740.9	-0.2	-21.9	0.26	0.00	31.75	2.4	21.8
2,928.0	0.80	50.20	2,927.8	1.5	-20.9	0.30	0.16	23.80	15.1	14.5
3,115.0	3.90	76.20	3,114.7	3.8	-13.7	1.71	1.66	13.90	12.4	7.0
3,304.0	6.90	72.70	3,302.8	8.7	3.4	1.60	1.59	-1.85	0.1	6.8
3,490.0	8.70	73.50	3,487.1	16.0	27.6	0.97	0.97	0.43	-8.4	5.4
3,677.0	9.50	72.00	3,671.7	24.8	55.8	0.45	0.43	-0.80	-19.5	3.5
3,864.0	8.50	71.30	3,856.4	34.0	83.6	0.54	-0.53	-0.37	-30.2	2.0
4,051.0	8.20	73.50	4,041.4	42.2	109.5	0.23	-0.16	1.18	-38.6	1.9
4,239.0	6.40	76.80	4,227.9	48.4	132.5	0.98	-0.96	1.76	-43.7	2.0
4,427.0	5.90	70.70	4,414.8	54.0	151.8	0.44	-0.27	-3.24	-45.0	-4.7
4,614.0	6.40	79.60	4,600.8	59.1	171.2	0.57	0.27	4.76	-46.7	0.0



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Survey												
MD (usft)	Inc (°)	Azi (azimuth) (°)		TVD (usft)	N/S (usft)	E/W (usft)	DLeg (°/100usft)	Build (°/100usft)	Turn (°/100usft)	High to Plan (usft)	Right to Plan (usft)	
4,802.0	4.80	76.80		4,787.8	62.8	189.1	0.86	-0.85	-1.49	-46.4		-5.6
4,989.0	6.30	88.50		4,974.0	64.8	207.0	1.00	0.80	6.26	-46.9		-1.1
5,177.0	5.80	76.80		5,160.9	67.3	226.6	0.71	-0.27	-6.22	-46.7		-15.6
5,363.0	4.40	72.30		5,346.2	71.6	242.5	0.78	-0.75	-2.42	-43.3		-21.3
5,551.0	5.80	62.60		5,533.4	78.1	257.8	0.87	0.74	-5.16	-36.9		-27.7
5,738.0	5.50	63.30		5,719.5	86.5	274.2	0.16	-0.16	0.37	-37.0		-25.6
5,925.0	5.10	62.30		5,905.7	94.4	289.6	0.22	-0.21	-0.53	-35.2		-24.5
6,113.0	6.70	55.90		6,092.7	104.4	306.1	0.92	0.85	-3.40	-33.1		-25.3
6,300.0	5.70	56.50		6,278.6	115.7	322.8	0.54	-0.53	0.32	-35.2		-21.1
6,488.0	5.30	57.30		6,465.8	125.5	337.9	0.22	-0.21	0.43	-35.0		-17.0
6,676.0	5.20	60.40		6,653.0	134.4	352.6	0.16	-0.05	1.65	-34.4		-12.1
6,864.0	5.20	64.40		6,840.2	142.3	367.7	0.19	0.00	2.13	-33.3		-7.9
7,050.0	5.10	69.60		7,025.5	148.8	383.1	0.26	-0.05	2.80	-31.9		-4.6
7,237.0	4.90	72.70		7,211.8	154.1	398.5	0.18	-0.11	1.66	-29.8		-4.0
7,425.0	4.30	75.80		7,399.1	158.2	413.0	0.35	-0.32	1.65	-26.3		-4.5
7,612.0	4.00	72.20		7,585.7	161.9	426.0	0.21	-0.16	-1.93	-20.8		-7.9
7,799.0	4.90	76.20		7,772.1	165.8	440.0	0.51	0.48	2.14	-17.2		-8.7
7,976.0	1.30	121.10		7,948.8	166.6	449.0	2.31	-2.03	25.37	-17.4		0.3
8,164.0	1.30	148.00		8,136.8	163.7	452.0	0.32	0.00	14.31	-18.8		5.8
8,351.0	0.80	180.20		8,323.7	160.6	453.1	0.40	-0.27	17.22	-15.9		16.1
8,539.0	0.40	228.40		8,511.7	158.9	452.6	0.33	-0.21	25.64	-0.1		23.6
8,726.0	0.40	312.90		8,698.7	158.9	451.6	0.29	0.00	45.19	22.7		3.1
8,913.0	2.90	259.20		8,885.6	158.4	446.5	1.43	1.34	-28.72	5.9		19.6
9,101.0	1.80	249.10		9,073.5	156.5	439.1	0.62	-0.59	-5.37	-5.3		19.5
9,288.0	1.10	240.00		9,260.4	154.5	434.8	0.39	-0.37	-4.87	-13.0		18.0
9,474.0	0.70	188.90		9,446.4	152.5	433.1	0.46	-0.22	-27.47	-24.4		-0.2
9,661.0	0.70	153.80		9,633.4	150.4	433.4	0.23	0.00	-18.77	-21.9		-14.9



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9,852.0	1.50	164.20	9,824.4	146.9	434.6	0.43	0.42	5.45	-27.9	-10.5
10,038.0	2.10	191.70	10,010.3	141.2	434.6	0.56	0.32	14.78	-35.1	4.7
10,226.0	2.20	231.30	10,198.1	135.6	431.0	0.78	0.05	21.06	-30.3	28.2
10,413.0	1.70	321.80	10,385.1	135.5	426.5	1.49	-0.27	48.40	25.7	33.7
10,601.0	1.40	336.20	10,573.0	139.8	423.9	0.26	-0.16	7.66	28.3	26.9
10,788.0	1.40	303.20	10,759.9	143.2	421.0	0.43	0.00	-17.65	4.9	36.7
10,975.0	0.70	241.30	10,946.9	143.9	418.1	0.66	-0.37	-33.10	-32.3	19.6
11,163.0	0.70	269.60	11,134.9	143.3	416.0	0.18	0.00	15.05	-21.3	33.1
11,350.0	3.20	7.60	11,321.8	148.5	415.5	1.80	1.34	52.41	30.7	17.6
11,537.0	1.00	333.10	11,508.7	155.1	415.5	1.31	-1.18	-18.45	9.4	29.0
11,724.0	1.20	349.90	11,695.6	158.5	414.4	0.20	0.11	8.98	13.8	25.5
11,817.0	0.80	8.20	11,788.6	160.1	414.3	0.55	-0.43	19.68	19.6	20.2
11,911.0	0.70	3.80	11,882.6	161.3	414.4	0.12	-0.11	-4.68	16.7	21.5
12,032.0	0.50	44.40	12,003.6	162.4	414.9	0.38	-0.17	33.55	25.6	6.0
12,126.0	0.40	67.00	12,097.6	162.9	415.5	0.21	-0.11	24.04	25.2	-4.2
12,220.0	0.50	78.80	12,191.6	163.1	416.2	0.14	0.11	12.55	23.1	-9.2
12,313.0	2.30	159.10	12,284.6	161.4	417.2	2.44	1.94	86.34	-6.0	-23.5
12,406.0	17.10	166.00	12,376.0	146.3	421.2	15.93	15.91	7.42	-9.2	-18.6
12,500.0	30.10	166.00	12,461.9	109.9	430.3	13.83	13.83	0.00	-14.1	-10.4
12,593.0	40.30	166.40	12,537.8	57.9	443.1	10.97	10.97	0.43	-19.1	1.6
12,687.0	45.80	174.80	12,606.6	-5.3	453.3	8.44	5.85	8.94	-16.4	13.8
12,780.0	54.90	179.80	12,665.9	-76.8	456.4	10.62	9.78	5.38	-6.4	17.2
12,815.4	62.49	179.53	12,684.2	-107.0	456.6	21.46	21.45	-0.76	-3.3	17.1
HL Crossing 12815.4' MD; 12684.2' TVD; -107.0'; 456.6'; 62.49										
12,835.0	66.70	179.40	12,692.7	-124.7	456.8	21.46	21.46	-0.68	-2.5	17.1
12,874.0	75.70	180.10	12,705.2	-161.6	456.9	23.14	23.08	1.79	-2.9	16.9
12,978.0	82.20	182.20	12,725.1	-263.6	454.9	6.56	6.25	2.02	-2.3	14.0



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13,072.0	86.30	181.60	12,734.5	-357.0	451.8	4.41	4.36	-0.64	5.1	10.1
13,124.0	92.40	181.20	12,735.1	-409.0	450.5	11.76	11.73	-0.77	5.2	8.4
13,165.0	93.20	181.90	12,733.1	-449.9	449.4	2.59	1.95	1.71	2.8	6.9
13,197.0	93.10	181.60	12,731.4	-481.8	448.4	0.99	-0.31	-0.94	0.8	5.6
13,228.0	93.80	181.90	12,729.5	-512.8	447.5	2.46	2.26	0.97	-1.3	4.4
13,259.0	95.80	181.20	12,726.9	-543.6	446.6	6.83	6.45	-2.26	-4.2	3.3
13,353.0	93.60	179.80	12,719.2	-637.3	445.8	2.77	-2.34	-1.49	-12.7	1.7
13,447.0	88.90	178.80	12,717.2	-731.3	447.0	5.11	-5.00	-1.06	-15.6	2.0
13,541.0	90.10	180.60	12,718.0	-825.2	447.5	2.30	1.28	1.91	-15.6	1.7
13,635.0	91.00	184.10	12,717.1	-919.2	443.6	3.84	0.96	3.72	-17.3	-2.9
13,728.0	89.30	187.90	12,716.8	-1,011.6	433.9	4.48	-1.83	4.09	-18.5	-13.4
13,822.0	90.80	183.40	12,716.8	-1,105.1	424.6	5.05	1.60	-4.79	-19.3	-23.5
13,916.0	89.50	182.10	12,716.5	-1,199.0	420.1	1.96	-1.38	-1.38	-20.4	-28.9
14,009.0	89.10	177.60	12,717.6	-1,292.0	420.4	4.86	-0.43	-4.84	-20.0	-29.4
14,103.0	89.00	180.40	12,719.2	-1,386.0	422.0	2.98	-0.11	2.98	-19.3	-28.6
14,196.0	91.00	178.30	12,719.2	-1,478.9	423.1	3.12	2.15	-2.26	-20.1	-28.4
14,290.0	88.30	175.30	12,719.8	-1,572.8	428.3	4.29	-2.87	-3.19	-20.4	-23.9
14,384.0	91.00	177.40	12,720.4	-1,666.6	434.3	3.64	2.87	2.23	-20.6	-18.8
14,478.0	89.40	178.60	12,720.0	-1,760.5	437.6	2.13	-1.70	1.28	-21.8	-16.3
14,571.0	90.80	179.20	12,719.9	-1,853.5	439.4	1.64	1.51	0.65	-22.7	-15.3
14,664.0	90.20	180.80	12,719.1	-1,946.5	439.4	1.84	-0.65	1.72	-24.4	-16.1
14,758.0	89.80	182.80	12,719.1	-2,040.4	436.4	2.17	-0.43	2.13	-25.2	-19.9
14,852.0	90.30	179.80	12,719.0	-2,134.4	434.3	3.24	0.53	-3.19	-26.1	-22.9
14,946.0	90.00	178.70	12,718.7	-2,228.4	435.5	1.21	-0.32	-1.17	-27.2	-22.4
15,038.0	86.40	178.10	12,721.6	-2,320.3	438.1	3.97	-3.91	-0.65	-25.1	-20.7
15,132.0	88.50	176.40	12,725.8	-2,414.1	442.6	2.87	2.23	-1.81	-21.7	-17.0
15,225.0	91.30	177.80	12,726.0	-2,506.9	447.3	3.37	3.01	1.51	-22.4	-13.1



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15,318.0	89.30	176.30	12,725.5	-2,599.8	452.1	2.69	-2.15	-1.61	-23.8	-9.1	
15,412.0	89.50	173.90	12,726.5	-2,693.5	460.1	2.56	0.21	-2.55	-23.7	-1.9	
15,506.0	91.10	173.50	12,726.0	-2,786.9	470.4	1.75	1.70	-0.43	-25.0	7.6	
15,598.0	87.00	173.90	12,727.5	-2,878.3	480.5	4.48	-4.46	0.43	-24.4	16.9	
15,691.0	86.50	177.70	12,732.8	-2,970.9	487.3	4.11	-0.54	4.09	-20.0	23.0	
15,784.0	93.80	183.50	12,732.5	-3,063.8	486.3	10.02	7.85	6.24	-21.1	21.2	
15,878.0	92.70	182.60	12,727.2	-3,157.5	481.3	1.51	-1.17	-0.96	-27.3	15.5	
15,971.0	89.50	180.10	12,725.4	-3,250.4	479.1	4.37	-3.44	-2.69	-29.9	12.5	
16,065.0	87.90	179.80	12,727.5	-3,344.4	479.2	1.73	-1.70	-0.32	-28.6	11.8	
16,159.0	86.30	178.00	12,732.3	-3,438.2	481.0	2.56	-1.70	-1.91	-24.8	12.8	
16,253.0	88.00	179.10	12,737.0	-3,532.1	483.4	2.15	1.81	1.17	-21.0	14.4	
16,347.0	88.60	180.50	12,739.8	-3,626.1	483.7	1.62	0.64	1.49	-19.1	13.9	
16,440.0	89.10	178.80	12,741.6	-3,719.0	484.3	1.91	0.54	-1.83	-18.1	13.7	
16,534.0	90.10	181.20	12,742.3	-3,813.0	484.3	2.77	1.06	2.55	-18.3	12.9	
16,628.0	90.40	186.30	12,741.9	-3,906.8	478.2	5.43	0.32	5.43	-19.6	5.9	
16,722.0	89.90	184.80	12,741.6	-4,000.3	469.1	1.68	-0.53	-1.60	-20.7	-3.9	
16,815.0	89.80	184.10	12,741.9	-4,093.1	461.8	0.76	-0.11	-0.75	-21.3	-11.9	
16,909.0	87.90	181.00	12,743.8	-4,186.9	457.7	3.87	-2.02	-3.30	-20.3	-16.9	
17,003.0	87.50	182.90	12,747.5	-4,280.8	454.5	2.06	-0.43	2.02	-17.4	-20.9	
17,096.0	87.70	183.20	12,751.4	-4,373.6	449.5	0.39	0.22	0.32	-14.4	-26.6	
17,190.0	86.70	182.20	12,756.0	-4,467.4	445.1	1.50	-1.06	-1.06	-10.7	-31.8	
17,283.0	85.90	176.10	12,762.0	-4,560.1	446.5	6.60	-0.86	-6.56	-5.4	-31.3	
17,377.0	84.70	176.50	12,769.7	-4,653.6	452.5	1.35	-1.28	0.43	1.4	-26.0	
17,448.4	83.95	176.65	12,776.8	-4,724.5	456.8	1.07	-1.05	0.21	7.8	-22.4	
HL Crossing 17448.4' MD; 12776.8' TVD; -4724.5'; 456.8'; 83.95											
17,472.0	83.70	176.70	12,779.3	-4,748.0	458.1	1.07	-1.05	0.21	10.1	-21.2	
Last MWD Survey (MD = 17472.0)											



Midland PVA

Company: EOG Resources - Midland
Project: Lea County, NM (NAD 83 NME)
Site: Ruby 2 State Com
Well: #703H
Wellbore: OH
Design: OH

Local Co-ordinate Reference: Well #703H
TVD Reference: KB = 25' @ 3330.0usft (HP 642)
MD Reference: KB = 25' @ 3330.0usft (HP 642)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.14

Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	DLeg (°/100usft)	Build (°/100usft)	Turn (°/100usft)	High to Plan (usft)	Right to Plan (usft)
17,561.0	83.70	176.70	12,789.1	-4,836.3	463.2	0.00	0.00	0.00	19.9	-19.4
Projection to Bit (MD = 17561.0)										

Survey Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
12,815.4	12,684.2	-107.0	456.6	HL Crossing 12815.4' MD; 12684.2' TVD; -107.0'; 456.6'; 62.49
17,448.4	12,776.8	-4,724.5	456.8	HL Crossing 17448.4' MD; 12776.8' TVD; -4724.5'; 456.8'; 83.95
17,472.0	12,779.3	-4,748.0	458.1	Last MWD Survey (MD = 17472.0)
17,561.0	12,789.1	-4,836.3	463.2	Projection to Bit (MD = 17561.0)

Checked By: _____ Approved By: _____ Date: _____