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BTA Oil Producers, LLC

Lea County, NM (NAD 83)
Sec 22, T25-S, R33-E
Rojo D 7811 JV-P COM #3H

Wellbore #1

Design: Wellbore #1

QES Survey Report

11 July, 2017





Survey Report



Company:	BTA Oil Producers, LLC	Local Co-ordinate Reference:	Well Rojo D 7811 JV-P COM #3H
Project:	Lea County, NM (NAD 83)	TVD Reference:	WELL @ 3382.0usft (Nomac #94)
Site:	Sec 22, T25-S, R33-E	MD Reference:	WELL @ 3382.0usft (Nomac #94)
Well:	Rojo D 7811 JV-P COM #3H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM5002

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

Site	Sec 22, T25-S, R33-E				
Site Position:		Northing:	409,243.40 usft	Latitude:	32° 7' 21.790 N
From:	Map	Easting:	781,148.30 usft	Longitude:	103° 33' 31.310 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.41 °

Well	Rojo D 7811 JV-P COM #3H					
Well Position	+N/-S	0.0 usft	Northing:	409,243.40 usft	Latitude:	32° 7' 21.790 N
	+E/-W	0.0 usft	Easting:	781,148.30 usft	Longitude:	103° 33' 31.310 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	0.0 usft	Ground Level:	3,357.0 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	6/1/2017	6.95	59.97	47,884

Design	Wellbore #1				
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	179.58	

Survey Program	Date 6/30/2017				
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
100.0	1,105.0	GYRO Survey (Wellbore #1)	GYRO-NS	OWSG Gyrocompass Gyro	
1,190.0	19,444.0	MWD Survey (Wellbore #1)	MWD default	MWD - Standard	

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00	
100.0	0.33	176.31	100.0	-0.3	0.0	0.3	0.33	0.33	0.00	
200.0	0.41	225.41	200.0	-0.8	-0.2	0.8	0.32	0.08	49.10	
300.0	0.67	217.70	300.0	-1.5	-0.8	1.5	0.27	0.26	-7.71	
400.0	0.77	216.47	400.0	-2.5	-1.6	2.5	0.10	0.10	-1.23	
500.0	0.75	220.65	500.0	-3.6	-2.4	3.6	0.06	-0.02	4.18	
600.0	0.84	252.63	600.0	-4.3	-3.5	4.3	0.45	0.09	31.98	
700.0	0.91	248.22	700.0	-4.8	-5.0	4.8	0.10	0.07	-4.41	
800.0	1.28	257.35	799.9	-5.3	-6.8	5.3	0.41	0.37	9.13	
900.0	1.62	250.60	899.9	-6.1	-9.2	6.0	0.38	0.34	-6.75	



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Well:	Rojo D 7811 JV-P COM #3H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM5002

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
1,000.0	1.74	250.40	999.9	-7.0	-12.0	7.0	0.12	0.12	-0.20
1,100.0	1.91	257.68	1,099.8	-7.9	-15.0	7.8	0.29	0.17	7.28
Gyro Tie-in @ 1105.0' MD / 1104.8' TVD									
1,105.0	1.90	257.99	1,104.8	-7.9	-15.2	7.8	0.29	-0.20	6.20
1,190.0	1.90	264.40	1,189.8	-8.4	-18.0	8.2	0.25	0.00	7.54
1,285.0	1.90	262.10	1,284.7	-8.7	-21.1	8.6	0.08	0.00	-2.42
1,475.0	4.30	226.30	1,474.4	-14.1	-29.4	13.9	1.57	1.26	-18.84
1,665.0	0.60	61.40	1,664.3	-18.5	-33.7	18.3	2.57	-1.95	-86.79
1,855.0	1.30	52.10	1,854.2	-16.7	-31.1	16.5	0.38	0.37	-4.89
2,045.0	1.30	45.50	2,044.2	-13.9	-27.9	13.7	0.08	0.00	-3.47
2,234.0	1.90	23.00	2,233.1	-9.5	-25.1	9.3	0.45	0.32	-11.90
2,424.0	2.20	11.80	2,423.0	-3.1	-23.1	2.9	0.26	0.16	-5.89
2,615.0	1.10	77.20	2,613.9	0.9	-20.6	-1.1	1.05	-0.58	34.24
2,805.0	0.60	121.00	2,803.9	0.8	-18.0	-1.0	0.41	-0.26	23.05
2,995.0	0.50	196.40	2,993.9	-0.5	-17.3	0.3	0.36	-0.05	39.68
3,184.0	0.50	169.60	3,182.9	-2.1	-17.4	1.9	0.12	0.00	-14.18
3,374.0	0.30	200.20	3,372.9	-3.4	-17.4	3.2	0.15	-0.11	16.11
3,564.0	0.30	230.50	3,562.9	-4.1	-18.0	4.0	0.08	0.00	15.95
3,754.0	0.60	244.50	3,752.9	-4.9	-19.3	4.7	0.17	0.16	7.37
3,944.0	0.40	285.50	3,942.9	-5.1	-20.8	5.0	0.21	-0.11	21.58
4,133.0	0.70	293.40	4,131.9	-4.5	-22.5	4.3	0.16	0.16	4.18
4,323.0	1.10	304.00	4,321.9	-3.0	-25.1	2.8	0.23	0.21	5.58
4,513.0	0.60	290.60	4,511.8	-1.7	-27.5	1.5	0.28	-0.26	-7.05
4,703.0	0.70	119.00	4,701.8	-1.9	-27.5	1.7	0.68	0.05	-90.32
4,893.0	1.20	140.60	4,891.8	-4.0	-25.2	3.8	0.32	0.26	11.37
4,971.0	1.10	139.90	4,969.8	-5.2	-24.2	5.0	0.13	-0.13	-0.90
5,161.0	0.90	137.50	5,159.8	-7.7	-22.0	7.5	0.11	-0.11	-1.26
5,351.0	0.90	120.80	5,349.7	-9.5	-19.7	9.4	0.14	0.00	-8.79
5,541.0	1.10	133.10	5,539.7	-11.5	-17.1	11.4	0.15	0.11	6.47
5,731.0	1.90	1.30	5,729.7	-9.6	-15.7	9.5	1.45	0.42	-69.37
5,921.0	4.70	351.40	5,919.3	1.2	-16.8	-1.3	1.50	1.47	-5.21
6,111.0	4.60	352.60	6,108.7	16.5	-18.9	-16.6	0.07	-0.05	0.63
6,300.0	4.60	351.10	6,297.1	31.5	-21.1	-31.6	0.06	0.00	-0.79
6,490.0	4.40	349.50	6,486.5	46.2	-23.6	-46.3	0.12	-0.11	-0.84
6,680.0	4.60	350.40	6,675.9	60.8	-26.2	-61.0	0.11	0.11	0.47
6,870.0	4.60	9.00	6,865.3	75.9	-26.3	-76.1	0.78	0.00	9.79
7,061.0	4.20	6.70	7,055.8	90.4	-24.2	-90.6	0.23	-0.21	-1.20
7,251.0	4.00	5.70	7,245.3	103.9	-22.8	-104.1	0.11	-0.11	-0.53
7,441.0	3.70	9.50	7,434.9	116.5	-21.1	-116.7	0.21	-0.16	2.00
7,630.0	3.30	8.30	7,623.5	127.9	-19.3	-128.1	0.22	-0.21	-0.63
7,820.0	3.10	1.30	7,813.2	138.5	-18.4	-138.6	0.23	-0.11	-3.68
8,010.0	4.00	354.20	8,002.8	150.2	-19.0	-150.3	0.53	0.47	-3.74
8,201.0	3.50	356.30	8,193.4	162.7	-20.0	-162.8	0.27	-0.26	1.10



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North Reference: Grid
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Database: EDM5002

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
8,391.0	3.70	1.80	8,383.1	174.6	-20.2	-174.7	0.21	0.11	2.89
8,581.0	2.90	357.90	8,572.7	185.5	-20.2	-185.6	0.44	-0.42	-2.05
8,747.0	2.10	351.60	8,738.6	192.7	-20.8	-192.9	0.51	-0.48	-3.80
8,877.0	8.80	181.40	8,868.2	185.1	-21.4	-185.2	8.37	5.15	-130.92
8,972.0	21.70	182.70	8,959.6	160.2	-22.4	-160.3	13.58	13.58	1.37
9,067.0	33.40	183.70	9,043.7	116.4	-24.9	-116.6	12.33	12.32	1.05
9,162.0	44.30	178.10	9,117.6	56.9	-25.5	-57.1	12.04	11.47	-5.89
9,257.0	50.00	179.00	9,182.2	-12.6	-23.7	12.5	6.04	6.00	0.95
9,352.0	54.00	180.70	9,240.7	-87.5	-23.6	87.3	4.44	4.21	1.79
9,447.0	58.00	182.00	9,293.8	-166.2	-25.5	166.0	4.36	4.21	1.37
9,541.0	63.10	183.40	9,340.0	-247.9	-29.3	247.7	5.58	5.43	1.49
9,637.0	77.70	182.50	9,372.1	-338.0	-33.9	337.8	15.23	15.21	-0.94
9,732.0	88.40	178.10	9,383.6	-432.2	-34.4	431.9	12.16	11.26	-4.63
9,855.0	89.40	178.40	9,385.9	-555.1	-30.6	554.8	0.85	0.81	0.24
10,045.0	89.30	180.00	9,388.1	-745.0	-28.0	744.8	0.84	-0.05	0.84
10,235.0	90.90	176.50	9,387.8	-934.9	-22.2	934.7	2.03	0.84	-1.84
10,425.0	89.40	174.90	9,387.3	-1,124.4	-7.9	1,124.3	1.15	-0.79	-0.84
10,615.0	92.80	175.80	9,383.6	-1,313.7	7.5	1,313.7	1.85	1.79	0.47
10,805.0	93.00	176.20	9,374.0	-1,503.0	20.7	1,503.1	0.24	0.11	0.21
10,995.0	89.90	174.60	9,369.2	-1,692.3	35.9	1,692.5	1.84	-1.63	-0.84
11,185.0	91.20	174.20	9,367.4	-1,881.3	54.5	1,881.7	0.72	0.68	-0.21
11,374.0	89.60	177.70	9,366.1	-2,069.8	67.8	2,070.3	2.04	-0.85	1.85
11,564.0	92.30	181.10	9,362.9	-2,259.8	69.8	2,260.2	2.28	1.42	1.79
11,754.0	88.70	181.30	9,361.2	-2,449.7	65.8	2,450.1	1.90	-1.89	0.11
11,944.0	88.60	182.80	9,365.7	-2,639.5	59.0	2,639.9	0.79	-0.05	0.79
12,134.0	89.50	183.50	9,368.9	-2,829.2	48.6	2,829.5	0.60	0.47	0.37
12,324.0	88.30	182.50	9,372.5	-3,018.9	38.6	3,019.1	0.82	-0.63	-0.53
12,514.0	91.40	183.40	9,373.0	-3,208.6	28.9	3,208.7	1.70	1.63	0.47
12,704.0	90.40	184.60	9,370.0	-3,398.1	15.6	3,398.1	0.82	-0.53	0.63
12,894.0	92.30	181.60	9,365.6	-3,587.7	5.3	3,587.7	1.87	1.00	-1.58
13,084.0	91.00	181.30	9,360.1	-3,777.6	0.5	3,777.5	0.70	-0.68	-0.16
13,274.0	90.90	182.30	9,356.9	-3,967.5	-5.4	3,967.3	0.53	-0.05	0.53
13,464.0	88.00	180.90	9,358.8	-4,157.4	-10.7	4,157.2	1.69	-1.53	-0.74
13,653.0	87.00	180.90	9,367.0	-4,346.2	-13.7	4,345.9	0.53	-0.53	0.00
13,843.0	87.90	181.60	9,375.5	-4,535.9	-17.8	4,535.7	0.60	0.47	0.37
14,033.0	90.90	177.40	9,377.4	-4,725.8	-16.2	4,725.6	2.72	1.58	-2.21
14,223.0	90.90	177.60	9,374.5	-4,915.6	-7.9	4,915.4	0.11	0.00	0.11
14,413.0	90.30	177.70	9,372.5	-5,105.5	-0.1	5,105.3	0.32	-0.32	0.05
14,603.0	88.70	177.20	9,374.1	-5,295.3	8.3	5,295.2	0.88	-0.84	-0.26
14,793.0	89.90	178.40	9,376.5	-5,485.1	15.6	5,485.1	0.89	0.63	0.63
14,983.0	88.50	178.30	9,379.1	-5,675.0	21.1	5,675.0	0.74	-0.74	-0.05
15,173.0	88.60	179.30	9,383.9	-5,864.9	25.1	5,864.9	0.53	0.05	0.53
15,363.0	92.20	181.10	9,382.6	-6,054.9	24.4	6,054.9	2.12	1.89	0.95



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Wellbore: Wellbore #1
Design: Wellbore #1

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Survey

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15,554.0	91.70	181.30	9,376.1	-6,245.7	20.4	6,245.7	0.28	-0.26	0.10
15,744.0	92.50	181.30	9,369.1	-6,435.5	16.1	6,435.5	0.42	0.42	0.00
15,934.0	90.70	179.50	9,363.8	-6,625.4	14.8	6,625.4	1.34	-0.95	-0.95
16,124.0	90.80	180.20	9,361.3	-6,815.4	15.3	6,815.3	0.37	0.05	0.37
16,314.0	90.70	180.20	9,358.8	-7,005.4	14.6	7,005.3	0.05	-0.05	0.00
16,503.0	91.00	180.20	9,356.0	-7,194.4	14.0	7,194.3	0.16	0.16	0.00
16,598.0	95.70	181.40	9,350.5	-7,289.2	12.7	7,289.1	5.11	4.95	1.26
16,693.0	91.40	180.40	9,344.6	-7,384.0	11.2	7,383.8	4.65	-4.53	-1.05
16,788.0	89.20	179.00	9,344.1	-7,478.9	11.7	7,478.8	2.74	-2.32	-1.47
16,883.0	88.60	179.30	9,345.9	-7,573.9	13.1	7,573.8	0.71	-0.63	0.32
17,073.0	91.10	178.80	9,346.4	-7,763.9	16.2	7,763.8	1.34	1.32	-0.26
17,262.0	91.10	178.80	9,342.8	-7,952.8	20.2	7,952.7	0.00	0.00	0.00
17,452.0	90.80	178.60	9,339.7	-8,142.7	24.5	8,142.7	0.19	-0.16	-0.11
17,643.0	92.10	178.60	9,334.8	-8,333.6	29.2	8,333.6	0.68	0.68	0.00
17,833.0	90.90	179.70	9,329.8	-8,523.5	32.0	8,523.5	0.86	-0.63	0.58
18,022.0	91.10	178.40	9,326.5	-8,712.4	35.1	8,712.5	0.70	0.11	-0.69
18,210.0	88.70	177.60	9,326.9	-8,900.3	41.7	8,900.4	1.35	-1.28	-0.43
18,400.0	90.80	177.40	9,327.7	-9,090.1	50.0	9,090.2	1.11	1.11	-0.11
18,588.0	91.50	178.40	9,323.9	-9,278.0	56.8	9,278.1	0.65	0.37	0.53
18,778.0	90.00	178.30	9,321.4	-9,467.9	62.3	9,468.1	0.79	-0.79	-0.05
18,967.0	92.00	177.90	9,318.1	-9,656.7	68.6	9,657.0	1.08	1.06	-0.21
19,157.0	90.80	177.70	9,313.5	-9,846.5	75.9	9,846.8	0.64	-0.63	-0.11
19,347.0	90.80	176.30	9,310.9	-10,036.2	85.8	10,036.6	0.74	0.00	-0.74
19,391.0	92.20	176.50	9,309.7	-10,080.1	88.6	10,080.5	3.21	3.18	0.45
TD @ 19444.0' MD / 9307.7'TVD									
19,444.0	92.20	176.50	9,307.7	-10,133.0	91.8	10,133.4	0.00	0.00	0.00

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
1,105.0	1,104.8	-7.9	-15.2	Gyro Tie-in @ 1105.0' MD / 1104.8' TVD
19,444.0	9,307.7	-10,133.0	91.8	TD @ 19444.0' MD / 9307.7'TVD

Checked By: _____ Approved By: _____ Date: _____