



HOBBS OCD
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BTA Oil Producers, LLC

Lea County, NM
Sec 10, T25-S, R33-E
Vaca Draw 9418 10 Fed 7H

Wellbore #1

Survey: MWD Survey #2

QES Survey Report

10 August, 2017



Quintana Energy Services

11390 FM 830
Willis, TX 77318
Phone: (936) 856-4332
Fax: (936) 856-8678



Survey Certification Sheet

Company	Job Number	Date
BTA Oil Producers	WT-170585	8/10/2017

Lease	Well Name	County & State
Sec10,T25-S,R33-E	Vaca Draw 9418 10 FED 7H	Lea, New Mexico

API No.	Survey Depth Range	Survey Type
30-025-43612	1165 feet to 14512 feet MD	MWD

Sidetrack Information	Directional Supervisor/Surveyor
N/A	Daniel Longoria

Certification Statement

The data and calculations for this survey have been checked by me and conform to the standards and procedures set forth by Quintana Energy Services (QES). This report represents a true and correct directional survey of this well based on the original data obtained at the well site. Wellbore coordinates are calculated using minimum curvature.

Christopher Hughes

Digitally signed by Christopher Hughes
DN: cn=Christopher Hughes, o=QES,
ou=compliance, email=chrish@qeslp.com,
c=US
Date: 2017.08.16 14:57:51 -05'00'

Christopher Hughes
MWD Compliance Manager
Quintana Energy Services

A large, stylized handwritten signature in blue ink, appearing to read 'CHRISTOPHER HUGHES', is written over a horizontal line.



Survey Report



Company: BTA Oil Producers, LLC
 Project: Lea County, NM
 Site: Sec 10, T25-S, R33-E
 Well: Vaca Draw 9418 10 Fed 7H
 Wellbore: Wellbore #1
 Design: Wellbore #1

Local Co-ordinate Reference: Well Vaca Draw 9418 10 Fed 7H
 TVD Reference: RKB @ 3446.0usft (Rig #94)
 MD Reference: RKB @ 3446.0usft (Rig #94)
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 Database: EDM 5000.1 Single User Db

Project	Lea County, NM		
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 Sec 10, T25-S, R33-E

Site Position: Northing: 419,638.60 usft Latitude: 32° 9' 4.678 N
 From: Map Easting: 741,405.70 usft Longitude: 103° 33' 11.948 W
 Position Uncertainty: 0.0 usft Slot Radius: 13-3/16 " Grid Convergence: 0.42 °

Well Vaca Draw 9418 10 Fed 7H

Well Position: +N/-S 0.0 usft Northing: 419,767.60 usft Latitude: 32° 9' 6.068 N
 +E/-W 0.0 usft Easting: 739,813.90 usft Longitude: 103° 33' 30.452 W
 Position Uncertainty: 0.0 usft Wellhead Elevation: 0.0 usft Ground Level: 3,421.0 usft

Wellbore Wellbore #1

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	5/22/2017	6.95	60.00	47,903.89896768

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	168.89

Survey Program	Date	From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
	6/5/2017	100.0	1,165.0	GYRO Survey #1 (Wellbore #1)	GYRO-NS	OWSG Gyrocompass Gyro
		1,283.0	14,512.0	MWD Survey #2 (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)
Tie-in Gyro @ 1165' MD / TVD										
	1,165.0	0.44	253.05	1,165.0	1.2	-5.8	-2.3	0.00	0.00	0.00
	1,283.0	0.60	276.70	1,283.0	1.1	-6.9	-2.4	0.22	0.14	20.04
	1,473.0	0.90	264.90	1,473.0	1.1	-9.4	-2.9	0.18	0.16	-6.21
	1,663.0	0.80	256.70	1,662.9	0.7	-12.1	-3.0	0.08	-0.05	-4.32
	1,853.0	1.10	262.10	1,852.9	0.1	-15.2	-3.0	0.16	0.16	2.84
	2,043.0	1.20	274.10	2,042.9	0.0	-19.0	-3.7	0.14	0.05	6.32
	2,233.0	1.60	280.40	2,232.8	0.6	-23.6	-5.2	0.23	0.21	3.32
	2,423.0	4.00	66.30	2,422.7	3.8	-20.2	-7.6	2.84	1.26	76.79
	2,613.0	9.10	70.90	2,611.4	11.4	0.1	-11.1	2.70	2.68	2.42



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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)
2,803.0	9.90	77.70	2,798.8	19.8	30.3	-13.5	0.72	0.42	3.58
2,993.0	10.30	76.20	2,985.8	27.3	62.7	-14.7	0.25	0.21	-0.79
3,183.0	10.00	83.00	3,172.9	33.3	95.6	-14.3	0.65	-0.16	3.58
3,373.0	10.50	81.90	3,359.8	37.8	129.1	-12.2	0.28	0.26	-0.58
3,562.0	9.70	84.20	3,545.9	41.8	162.0	-9.8	0.47	-0.42	1.22
3,752.0	9.40	81.90	3,733.3	45.6	193.3	-7.5	0.26	-0.16	-1.21
3,942.0	9.20	77.60	3,920.8	51.1	223.5	-7.1	0.38	-0.11	-2.26
4,132.0	8.40	74.20	4,108.5	58.1	251.7	-8.5	0.50	-0.42	-1.79
4,322.0	8.80	77.70	4,296.4	65.0	279.2	-10.0	0.35	0.21	1.84
4,512.0	9.10	81.30	4,484.1	70.4	308.3	-9.6	0.33	0.16	1.89
4,702.0	8.90	84.90	4,671.8	73.9	337.8	-7.5	0.31	-0.11	1.89
4,892.0	9.50	93.00	4,859.3	74.4	368.1	-2.1	0.75	0.32	4.26
5,076.0	7.80	93.40	5,041.2	72.9	395.7	4.7	0.92	-0.92	0.22
5,257.0	8.90	79.10	5,220.3	74.8	421.7	7.8	1.29	0.61	-7.90
5,447.0	9.80	75.80	5,407.8	81.6	451.8	7.0	0.55	0.47	-1.74
5,637.0	10.10	73.50	5,594.9	90.3	483.5	4.6	0.26	0.16	-1.21
5,827.0	10.30	79.10	5,781.9	98.2	516.1	3.1	0.53	0.11	2.95
6,017.0	9.10	85.50	5,969.2	102.6	547.8	4.9	0.85	-0.63	3.37
6,207.0	9.50	83.20	6,156.7	105.6	578.3	7.8	0.29	0.21	-1.21
6,397.0	9.60	81.60	6,344.1	109.8	609.6	9.7	0.15	0.05	-0.84
6,587.0	9.90	80.70	6,531.4	114.8	641.4	11.0	0.18	0.16	-0.47
6,776.0	8.80	87.20	6,717.8	118.1	671.9	13.6	0.81	-0.58	3.44
6,966.0	9.10	85.60	6,905.5	119.9	701.3	17.4	0.21	0.16	-0.84
7,156.0	8.60	85.60	7,093.3	122.2	730.5	20.9	0.26	-0.26	0.00
7,346.0	8.60	84.40	7,281.1	124.7	758.8	23.9	0.09	0.00	-0.63
7,536.0	8.70	84.60	7,469.0	127.4	787.2	26.7	0.05	0.05	0.11
7,725.0	8.50	84.80	7,655.8	130.0	815.4	29.5	0.11	-0.11	0.11
7,915.0	7.60	83.70	7,844.0	132.7	841.9	32.0	0.48	-0.47	-0.58
8,105.0	7.00	81.90	8,032.4	135.7	865.8	33.7	0.34	-0.32	-0.95
8,295.0	6.60	81.90	8,221.1	138.8	888.1	34.9	0.21	-0.21	0.00
8,485.0	6.00	83.20	8,409.9	141.6	908.7	36.2	0.32	-0.32	0.68
8,676.0	4.30	91.60	8,600.2	142.5	925.8	38.5	0.97	-0.89	4.40
8,866.0	0.30	211.10	8,790.0	141.9	932.7	40.5	2.34	-2.11	62.89
8,947.0	0.30	224.50	8,871.0	141.6	932.4	40.7	0.09	0.00	16.54
9,069.0	5.90	190.60	8,992.8	135.2	931.1	46.7	4.63	4.59	-27.79
9,164.0	15.50	182.90	9,086.0	117.7	929.5	63.6	10.19	10.11	-8.11
9,259.0	23.60	180.40	9,175.5	85.9	928.7	94.6	8.57	8.53	-2.63
9,354.0	33.20	180.70	9,258.9	40.8	928.3	138.8	10.11	10.11	0.32
9,449.0	43.90	180.70	9,333.1	-18.3	927.6	196.7	11.26	11.26	0.00
9,544.0	54.00	180.20	9,395.4	-89.9	927.0	266.8	10.64	10.63	-0.53
9,639.0	65.40	179.30	9,443.3	-171.8	927.4	347.2	12.03	12.00	-0.95
9,734.0	77.90	178.40	9,473.1	-261.7	929.2	435.9	13.19	13.16	-0.95
9,829.0	89.20	177.40	9,483.8	-355.9	932.7	529.0	11.94	11.89	-1.05



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9,856.0	89.80	177.60	9,484.0	-382.9	933.9	555.7	2.34	2.22	0.74
10,046.0	89.60	178.40	9,485.0	-572.8	940.5	743.3	0.43	-0.11	0.42
10,236.0	89.20	179.70	9,487.0	-762.7	943.7	930.3	0.72	-0.21	0.68
10,426.0	89.30	181.40	9,489.5	-952.7	941.8	1,116.3	0.90	0.05	0.89
10,615.0	91.00	182.50	9,489.0	-1,141.6	935.4	1,300.4	1.07	0.90	0.58
10,806.0	89.40	181.10	9,488.3	-1,332.5	929.4	1,486.6	1.11	-0.84	-0.73
10,995.0	87.80	179.20	9,492.9	-1,521.4	928.9	1,671.9	1.31	-0.85	-1.01
11,185.0	88.90	177.90	9,498.4	-1,711.2	933.7	1,859.1	0.90	0.58	-0.68
11,375.0	90.50	177.40	9,499.4	-1,901.1	941.5	2,046.9	0.88	0.84	-0.26
11,565.0	90.80	176.90	9,497.3	-2,090.8	951.0	2,234.9	0.31	0.16	-0.26
11,755.0	89.30	175.30	9,497.1	-2,280.4	963.9	2,423.4	1.15	-0.79	-0.84
11,945.0	90.20	176.90	9,497.9	-2,469.9	976.8	2,611.9	0.97	0.47	0.84
12,135.0	90.10	177.40	9,497.4	-2,659.7	986.3	2,799.9	0.27	-0.05	0.26
12,325.0	90.40	178.40	9,496.6	-2,849.6	993.2	2,987.5	0.55	0.16	0.53
12,515.0	91.10	178.40	9,494.1	-3,039.5	998.5	3,174.9	0.37	0.37	0.00
12,704.0	90.40	179.00	9,491.6	-3,228.4	1,002.8	3,361.1	0.49	-0.37	0.32
12,894.0	89.30	179.30	9,492.1	-3,418.4	1,005.6	3,548.1	0.60	-0.58	0.16
13,084.0	91.00	179.70	9,491.6	-3,608.4	1,007.3	3,734.8	0.92	0.89	0.21
13,274.0	90.10	180.70	9,489.8	-3,798.3	1,006.6	3,921.1	0.71	-0.47	0.53
13,464.0	89.40	180.40	9,490.6	-3,988.3	1,004.8	4,107.2	0.40	-0.37	-0.16
13,654.0	88.60	181.60	9,494.0	-4,178.3	1,001.5	4,292.9	0.76	-0.42	0.63
13,844.0	91.00	179.70	9,494.6	-4,368.2	999.3	4,478.9	1.61	1.26	-1.00
14,034.0	91.20	179.50	9,491.0	-4,558.2	1,000.7	4,665.6	0.15	0.11	-0.11
14,224.0	90.60	181.40	9,488.0	-4,748.1	999.2	4,851.7	1.05	-0.32	1.00
14,414.0	91.10	182.10	9,485.2	-4,938.0	993.4	5,036.9	0.45	0.26	0.37
TD @ 14512.0' MD / 9483.3' TVD									
14,512.0	91.10	182.10	9,483.3	-5,036.0	989.8	5,132.3	0.00	0.00	0.00

Survey Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
1,165.0	1,165.0	1.2	-5.8	Tie-in Gyro @ 1165' MD / TVD
14,512.0	9,483.3	-5,036.0	989.8	TD @ 14512.0' MD / 9483.3' TVD

Checked By: _____ Approved By: _____ Date: _____