



## **Extraction Oil & Gas**

**Weld County, CO (NAD83)**

**Sec.19-T7N-R65W**

**WAAG 11**

**Wellbore #1 / Job #1523847**

**Survey: Phoenix MWD Surveys**

## **Standard Survey Report**

**22 July, 2015**

<b>Company:</b>	Extraction Oil & Gas	<b>Local Co-ordinate Reference:</b>	Well WAAG 11
<b>Project:</b>	Weld County, CO (NAD83)	<b>TVD Reference:</b>	RKB @ 4909.00usft (H&P 319)
<b>Site:</b>	Sec.19-T7N-R65W	<b>MD Reference:</b>	RKB @ 4909.00usft (H&P 319)
<b>Well:</b>	WAAG 11	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1 / Job #1523847	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Surveys (H&P 319)	<b>Database:</b>	Compass 5000 RMR

<b>Project</b>	Weld County, CO (NAD83)		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		
<b>Map Zone:</b>	Colorado Northern Zone		

Site		Sec.19-T7N-R65W					
Site Position:		Northing:	1,450,756.06	usft	Latitude:	40° 34' 4.935 N	
From:	Map	Easting:	3,219,612.83	usft	Longitude:	104° 42' 34.213 W	
Position Uncertainty:		0.00	usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.51 °

Well	WAAG 11					
Well Position	+N/-S	0.00 usft	Northing:	1,448,304.24 usft	Latitude:	40° 33' 40.644 N
	+E/-W	0.00 usft	Easting:	3,220,341.42 usft	Longitude:	104° 42' 25.056 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	4,885.00 usft

<b>Wellbore</b>	Wellbore #1 / Job #1523847				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	HDGM	6/25/2015	8.32	67.08	52,651

<b>Design</b>	Surveys (H&P 319)				
<b>Audit Notes:</b>					
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b>	0.00
<b>Vertical Section:</b>	<b>Depth From (TVD) (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Direction (°)</b>	
	0.00	0.00	0.00	274.56	

<b>Survey Program</b>	<b>Date</b>	7/22/2015			
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
141.00	828.00	Newsco Surveys (Wellbore #1 / Job #1523	MWD		
1,029.00	11,960.00	Phoenix MWD Surveys (Wellbore #1 / Job	PHX+MWD+HDGM	PHX+MWD+HDGM	

<b>Survey</b>										
<b>Measured Depth (usft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Vertical Section (usft)</b>	<b>Dogleg Rate (°/100usft)</b>	<b>Build Rate (°/100usft)</b>	<b>Turn Rate (°/100usft)</b>	
828.00	1.00	120.40	827.93	-1.44	-0.25	0.14	0.00	0.00	0.00	
<b>Tie In to Newsco Surveys</b>										
1,029.00	1.15	113.23	1,028.89	-3.12	3.11	-3.35	0.10	0.07	-3.57	
<b>First Phoenix MWD Survey</b>										
1,121.00	1.26	115.24	1,120.87	-3.92	4.88	-5.17	0.13	0.12	2.18	
1,484.00	6.22	50.43	1,483.07	6.92	23.66	-23.04	1.60	1.37	-17.85	
1,576.00	6.54	49.78	1,574.50	13.47	31.50	-30.33	0.36	0.35	-0.71	
1,667.00	6.68	48.82	1,664.90	20.30	39.44	-37.70	0.20	0.15	-1.05	
1,850.00	5.94	44.27	1,846.79	34.09	54.06	-51.18	0.49	-0.40	-2.49	

<b>Company:</b>	Extraction Oil & Gas	<b>Local Co-ordinate Reference:</b>	Well WAAG 11
<b>Project:</b>	Weld County, CO (NAD83)	<b>TVD Reference:</b>	RKB @ 4909.00usft (H&P 319)
<b>Site:</b>	Sec.19-T7N-R65W	<b>MD Reference:</b>	RKB @ 4909.00usft (H&P 319)
<b>Well:</b>	WAAG 11	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1 / Job #1523847	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Surveys (H&P 319)	<b>Database:</b>	Compass 5000 RMR

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)	
1,942.00	5.50	45.37	1,938.33	40.60	60.53	-57.11	0.49	-0.48	1.20	
2,034.00	4.79	42.34	2,029.96	46.54	66.25	-62.34	0.83	-0.77	-3.29	
2,125.00	4.42	39.22	2,120.66	52.06	71.03	-66.66	0.49	-0.41	-3.43	
2,217.00	4.01	37.57	2,212.41	57.36	75.23	-70.43	0.46	-0.45	-1.79	
2,400.00	5.00	45.48	2,394.85	68.02	84.82	-79.14	0.64	0.54	4.32	
2,494.00	5.01	41.49	2,488.49	73.97	90.46	-84.29	0.37	0.01	-4.24	
2,683.00	4.24	31.66	2,676.88	86.10	99.59	-92.43	0.58	-0.41	-5.20	
2,778.00	3.88	28.71	2,771.64	91.91	102.98	-95.35	0.44	-0.38	-3.11	
2,872.00	3.81	23.69	2,865.43	97.55	105.76	-97.67	0.37	-0.07	-5.34	
2,966.00	6.39	47.93	2,959.06	103.92	110.90	-102.29	3.52	2.74	25.79	
3,060.00	6.13	43.42	3,052.50	111.07	118.23	-109.03	0.59	-0.28	-4.80	
3,249.00	4.33	38.34	3,240.70	124.00	129.60	-119.33	0.98	-0.95	-2.69	
3,343.00	3.90	32.18	3,334.46	129.49	133.50	-122.78	0.66	-0.46	-6.55	
3,437.00	3.94	34.08	3,428.24	134.87	137.01	-125.86	0.14	0.04	2.02	
3,532.00	4.60	54.44	3,522.98	139.79	141.94	-130.38	1.73	0.69	21.43	
3,626.00	3.87	56.38	3,616.73	143.74	147.65	-135.75	0.79	-0.78	2.06	
3,720.00	2.87	70.25	3,710.56	146.29	152.51	-140.39	1.37	-1.06	14.76	
3,815.00	2.70	68.17	3,805.45	147.92	156.82	-144.56	0.21	-0.18	-2.19	
3,909.00	4.29	54.06	3,899.27	150.81	161.72	-149.22	1.91	1.69	-15.01	
4,003.00	5.76	45.34	3,992.91	156.19	167.93	-154.98	1.76	1.56	-9.28	
4,097.00	5.45	41.81	4,086.46	162.83	174.26	-160.76	0.49	-0.33	-3.76	
4,381.00	4.06	34.47	4,369.48	181.17	188.94	-173.94	0.53	-0.49	-2.58	
4,475.00	4.50	30.86	4,463.22	187.08	192.71	-177.23	0.55	0.47	-3.84	
4,569.00	4.64	36.06	4,556.92	193.32	196.84	-180.85	0.47	0.15	5.53	
4,664.00	4.27	38.47	4,651.63	199.20	201.30	-184.83	0.44	-0.39	2.54	
4,758.00	5.04	38.44	4,745.32	205.17	206.05	-189.08	0.82	0.82	-0.03	
4,852.00	5.26	51.10	4,838.95	211.11	211.97	-194.51	1.23	0.23	13.47	
4,947.00	3.87	44.96	4,933.64	216.11	217.62	-199.75	1.55	-1.46	-6.46	
5,041.00	4.83	47.92	5,027.37	221.01	222.80	-204.53	1.05	1.02	3.15	
5,135.00	4.38	42.55	5,121.07	226.31	228.17	-209.45	0.66	-0.48	-5.71	
5,230.00	5.46	43.72	5,215.72	232.25	233.74	-214.54	1.14	1.14	1.23	
5,324.00	3.87	41.04	5,309.40	237.87	238.92	-219.25	1.71	-1.69	-2.85	
5,512.00	5.68	41.99	5,496.74	249.57	249.31	-228.68	0.96	0.96	0.51	
5,606.00	4.51	31.88	5,590.37	256.17	254.37	-233.20	1.56	-1.24	-10.76	
5,701.00	2.94	24.54	5,685.17	261.56	257.36	-235.75	1.72	-1.65	-7.73	
5,889.00	4.42	57.57	5,872.79	269.83	265.48	-243.18	1.34	0.79	17.57	
5,984.00	5.12	58.80	5,967.47	273.99	272.19	-249.55	0.74	0.74	1.29	
6,078.00	3.12	45.22	6,061.22	277.96	277.60	-254.62	2.35	-2.13	-14.45	
6,172.00	4.32	40.36	6,155.02	282.46	281.70	-258.36	1.32	1.28	-5.17	
6,266.00	4.59	30.94	6,248.74	288.39	285.93	-262.10	0.83	0.29	-10.02	
6,360.00	3.50	16.72	6,342.50	294.36	288.69	-264.37	1.57	-1.16	-15.13	
6,455.00	2.40	356.74	6,437.38	299.13	289.41	-264.71	1.57	-1.16	-21.03	
6,549.00	2.48	335.73	6,531.30	302.94	288.46	-263.47	0.95	0.09	-22.35	

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<b>Wellbore:</b>	Wellbore #1 / Job #1523847	<b>Survey Calculation Method:</b>	Minimum Curvature
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Survey									
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6,638.00	5.05	321.42	6,620.10	307.76	285.23	-259.86	3.05	2.89	-16.08
6,733.00	9.81	287.03	6,714.31	313.41	274.87	-249.09	6.65	5.01	-36.20
6,827.00	16.28	289.40	6,805.84	320.14	254.77	-228.51	6.91	6.88	2.52
6,921.00	20.37	282.33	6,895.07	328.01	226.34	-199.55	4.94	4.35	-7.52
7,023.00	30.06	275.42	6,987.26	334.23	183.46	-156.30	9.91	9.50	-6.77
7,117.00	38.65	275.26	7,064.79	339.15	130.69	-103.31	9.14	9.14	-0.17
7,211.00	50.96	271.79	7,131.36	343.00	64.71	-37.23	13.35	13.10	-3.69
7,305.00	68.35	270.74	7,178.67	344.72	-16.08	43.44	18.52	18.50	-1.12
7,399.00	87.46	272.01	7,198.28	346.95	-107.54	134.79	20.37	20.33	1.35
7,509.00	86.67	268.27	7,203.91	347.22	-217.38	244.30	3.47	-0.72	-3.40
7,578.00	87.71	268.32	7,207.29	345.17	-286.26	312.80	1.51	1.51	0.07
7,673.00	89.47	268.09	7,209.63	342.20	-381.18	407.18	1.87	1.85	-0.24
7,767.00	90.61	267.64	7,209.56	338.69	-475.12	500.54	1.30	1.21	-0.48
7,862.00	92.55	268.17	7,206.95	335.22	-570.01	594.86	2.12	2.04	0.56
7,956.00	91.76	268.92	7,203.41	332.84	-663.92	688.28	1.16	-0.84	0.80
8,050.00	89.86	269.05	7,202.08	331.17	-757.89	781.82	2.03	-2.02	0.14
8,145.00	90.28	271.63	7,201.97	331.74	-852.88	876.55	2.75	0.44	2.72
8,239.00	90.14	275.46	7,201.62	337.55	-946.68	970.52	4.08	-0.15	4.07
8,334.00	90.70	277.24	7,200.92	348.05	-1,041.09	1,065.46	1.96	0.59	1.87
8,428.00	89.64	274.67	7,200.65	357.80	-1,134.57	1,159.43	2.96	-1.13	-2.73
8,523.00	88.69	273.92	7,202.03	364.92	-1,229.29	1,254.41	1.27	-1.00	-0.79
8,617.00	90.89	272.55	7,202.37	370.22	-1,323.14	1,348.38	2.76	2.34	-1.46
8,711.00	90.95	268.88	7,200.86	371.39	-1,417.10	1,442.14	3.90	0.06	-3.90
8,806.00	90.56	267.23	7,199.61	368.17	-1,512.03	1,536.52	1.78	-0.41	-1.74
8,900.00	90.08	266.65	7,199.09	363.15	-1,605.90	1,629.69	0.80	-0.51	-0.62
8,994.00	90.03	266.22	7,199.00	357.31	-1,699.71	1,722.74	0.46	-0.05	-0.46
9,089.00	89.66	265.75	7,199.25	350.66	-1,794.48	1,816.68	0.63	-0.39	-0.49
9,183.00	89.05	265.51	7,200.31	343.49	-1,888.20	1,909.53	0.70	-0.65	-0.26
9,278.00	89.64	267.24	7,201.40	337.49	-1,983.00	2,003.56	1.92	0.62	1.82
9,372.00	88.35	269.07	7,203.05	334.46	-2,076.93	2,096.95	2.38	-1.37	1.95
9,466.00	89.19	269.94	7,205.07	333.65	-2,170.90	2,190.56	1.29	0.89	0.93
9,560.00	90.59	273.77	7,205.25	336.69	-2,264.84	2,284.43	4.34	1.49	4.07
9,655.00	91.85	276.65	7,203.22	345.32	-2,359.41	2,379.40	3.31	1.33	3.03
9,749.00	91.57	276.82	7,200.42	356.34	-2,452.72	2,473.29	0.35	-0.30	0.18
9,844.00	90.50	276.75	7,198.70	367.56	-2,547.04	2,568.20	1.13	-1.13	-0.07
10,032.00	83.42	273.84	7,208.67	384.88	-2,733.83	2,755.78	4.07	-3.77	-1.55
10,127.00	80.87	270.85	7,221.65	388.74	-2,827.84	2,849.80	4.11	-2.68	-3.15
10,221.00	85.94	268.62	7,232.45	388.30	-2,921.18	2,942.81	5.89	5.39	-2.37
10,315.00	90.42	269.20	7,235.43	386.51	-3,015.09	3,036.28	4.81	4.77	0.62
10,410.00	95.71	270.33	7,230.35	386.12	-3,109.92	3,130.78	5.69	5.57	1.19
10,504.00	93.36	270.40	7,222.92	386.72	-3,203.62	3,224.22	2.50	-2.50	0.07
10,598.00	90.20	269.61	7,220.00	386.73	-3,297.56	3,317.87	3.47	-3.36	-0.84
10,692.00	87.43	269.46	7,221.95	385.97	-3,391.53	3,411.48	2.95	-2.95	-0.16
10,787.00	87.09	269.43	7,226.49	385.05	-3,486.42	3,505.99	0.36	-0.36	-0.03

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<b>Site:</b>	Sec.19-T7N-R65W	<b>MD Reference:</b>	RKB @ 4909.00usft (H&P 319)
<b>Well:</b>	WAAG 11	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1 / Job #1523847	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Surveys (H&P 319)	<b>Database:</b>	Compass 5000 RMR

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)	
10,881.00	88.49	269.42	7,230.11	384.10	-3,580.34	3,599.54	1.49	1.49	-0.01	
10,975.00	89.72	269.67	7,231.58	383.36	-3,674.32	3,693.17	1.34	1.31	0.27	
11,069.00	89.86	269.89	7,231.93	383.00	-3,768.32	3,786.84	0.28	0.15	0.23	
11,164.00	90.36	270.70	7,231.74	383.49	-3,863.32	3,881.58	1.00	0.53	0.85	
11,258.00	90.22	270.24	7,231.27	384.26	-3,957.31	3,975.34	0.51	-0.15	-0.49	
11,352.00	90.50	269.62	7,230.68	384.14	-4,051.31	4,069.03	0.72	0.30	-0.66	
11,447.00	89.33	268.86	7,230.82	382.88	-4,146.30	4,163.62	1.47	-1.23	-0.80	
11,541.00	90.11	268.38	7,231.28	380.62	-4,240.27	4,257.11	0.97	0.83	-0.51	
11,635.00	89.50	269.27	7,231.60	378.69	-4,334.25	4,350.64	1.15	-0.65	0.95	
11,729.00	89.97	268.04	7,232.03	376.48	-4,428.22	4,444.13	1.40	0.50	-1.31	
11,824.00	89.52	266.33	7,232.45	371.82	-4,523.10	4,538.34	1.86	-0.47	-1.80	
11,890.00	89.83	265.08	7,232.83	366.88	-4,588.91	4,603.56	1.95	0.47	-1.89	
Final Phoenix MWD Survey										
11,960.00	89.83	265.08	7,233.04	360.87	-4,658.65	4,672.60	0.00	0.00	0.00	
Projection to TD										

Survey Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
828.00	827.93	-1.44	-0.25	Tie In to Newsco Surveys	
1,029.00	1,028.89	-3.12	3.11	First Phoenix MWD Survey	
11,890.00	7,232.83	366.88	-4,588.91	Final Phoenix MWD Survey	
11,960.00	7,233.04	360.87	-4,658.65	Projection to TD	

Checked By: \_\_\_\_\_ Approved By: \_\_\_\_\_ Date: \_\_\_\_\_