

# **Extraction Oil & Gas**

**Weld County, CO (NAD83)**

**Rinn Valley East Pad (Sec.18-T2N-R68W)**

**Rinn Valley East N17-20-11N**

**Wellbore #1**

**Design: Wellbore #1**

## **Standard Survey Report**

**05 August, 2018**

## Survey Report

<b>Company:</b>	Extraction Oil & Gas	<b>Local Co-ordinate Reference:</b>	Well Rinn Valley East N17-20-11N
<b>Project:</b>	Weld County, CO (NAD83)	<b>TVD Reference:</b>	KB=25 @ 4962.10ft (Patterson #346)
<b>Site:</b>	Rinn Valley East Pad (Sec.18-T2N-R68W)	<b>MD Reference:</b>	KB=25 @ 4962.10ft (Patterson #346)
<b>Well:</b>	Rinn Valley East N17-20-11N	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<b>Database:</b>	EDM 5000.1

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

Site	Rinn Valley East Pad (Sec.18-T2N-R68W)				
Site Position:		Northing:	1,291,282.60 usft	Latitude:	40.13204
From:	Map	Easting:	3,128,935.11 usft	Longitude:	-105.03888
Position Uncertainty:	0.00 ft	Slot Radius:	13-3/16 "	Grid Convergence:	0.30 °

Well		Rinn Valley East N17-20-11N				
Well Position	+N/-S	0.00 ft	Northing:	1,291,283.31 usfi	Latitude:	40.13204
	+E/-W	0.00 ft	Easting:	3,129,075.20 usfi	Longitude:	-105.03838
Position Uncertainty		0.00 ft	Wellhead Elevation:	0.00 ft	Ground Level:	4,937.10 ft

<b>Wellbore</b>	Wellbore #1				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	HDGM	7/28/2018	8.47	66.52	52,011

<b>Design</b>	Wellbore #1				
<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) (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Direction (°)</b>	
	0.00	0.00	0.00	14.46	

<b>Survey Program</b>	<b>Date</b>	8/5/2018			
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
87.00	1,609.00	Surface (Wellbore #1)	NS-GYRO-MS	North sensing gyrocompassing m/s	
1,745.00	17,880.00	MWD Surveys (Wellbore #1)	MWD	MWD - Standard	

<b>Survey</b>										
<b>Measured Depth (ft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Vertical Section (ft)</b>	<b>Dogleg Rate (°/100usft)</b>	<b>Build Rate (°/100usft)</b>	<b>Turn Rate (°/100usft)</b>	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
87.00	0.22	146.11	87.00	-0.14	0.09	-0.11	0.25	0.25	0.00	
149.00	0.42	123.71	149.00	-0.36	0.35	-0.27	0.37	0.32	-36.13	
230.00	0.89	135.07	229.99	-0.97	1.04	-0.68	0.60	0.58	14.02	
315.00	1.84	150.86	314.97	-2.63	2.17	-2.01	1.19	1.12	18.58	
399.00	2.25	123.73	398.92	-4.73	4.20	-3.53	1.24	0.49	-32.30	
484.00	2.98	95.35	483.83	-5.86	7.79	-3.73	1.72	0.86	-33.39	
567.00	5.34	90.00	566.61	-6.06	13.80	-2.42	2.88	2.84	-6.45	
653.00	7.50	87.21	652.06	-5.79	23.41	0.24	2.54	2.51	-3.24	
736.00	7.90	86.03	734.31	-5.13	34.51	3.65	0.52	0.48	-1.42	

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<b>Well:</b>	Rinn Valley East N17-20-11N	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<b>Database:</b>	EDM 5000.1

### Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
821.00	10.29	87.68	818.24	-4.42	47.92	7.69	2.83	2.81	1.94
906.00	11.85	91.70	901.66	-4.37	64.23	11.81	2.05	1.84	4.73
989.00	14.39	96.80	982.49	-5.84	83.00	15.07	3.36	3.06	6.14
1,073.00	16.00	98.61	1,063.55	-8.81	104.81	17.64	2.00	1.92	2.15
1,157.00	16.84	99.53	1,144.12	-12.56	128.25	19.87	1.05	1.00	1.10
1,243.00	18.51	100.00	1,226.06	-16.99	153.98	22.01	1.95	1.94	0.55
1,328.00	20.34	98.72	1,306.22	-21.58	181.88	24.53	2.21	2.15	-1.51
1,413.00	21.37	98.88	1,385.65	-26.21	211.78	27.52	1.21	1.21	0.19
1,495.00	23.35	98.75	1,461.48	-30.98	242.61	30.59	2.42	2.41	-0.16
1,582.00	24.86	96.90	1,540.89	-35.80	277.80	34.71	1.94	1.74	-2.13
1,609.00	26.61	97.00	1,565.21	-37.22	289.44	36.25	6.48	6.48	0.37
<b>Tie in to Surface Surveys @ 1609'MD</b>									
1,745.00	27.80	93.17	1,686.17	-42.69	351.34	46.41	1.56	0.88	-2.82
<b>First MWD Survey @ 1745'MD</b>									
1,839.00	28.19	95.28	1,769.18	-45.95	395.34	54.25	1.13	0.41	2.24
1,932.00	29.43	98.59	1,850.67	-51.38	439.81	60.10	2.17	1.33	3.56
2,026.00	31.42	102.16	1,931.73	-59.99	486.61	63.44	2.86	2.12	3.80
2,120.00	30.05	101.58	2,012.52	-69.88	533.62	65.61	1.49	-1.46	-0.62
2,214.00	31.02	100.00	2,093.49	-78.81	580.53	68.68	1.34	1.03	-1.68
2,308.00	29.30	98.37	2,174.76	-86.36	627.14	73.01	2.03	-1.83	-1.73
2,402.00	29.87	98.85	2,256.50	-93.31	673.03	77.74	0.66	0.61	0.51
2,496.00	31.64	97.97	2,337.28	-100.33	720.58	82.82	1.94	1.88	-0.94
2,591.00	29.96	97.40	2,418.88	-106.84	768.78	88.55	1.79	-1.77	-0.60
2,685.00	30.71	96.47	2,500.01	-112.57	815.91	94.78	0.94	0.80	-0.99
2,779.00	31.77	95.99	2,580.38	-117.86	864.37	101.76	1.16	1.13	-0.51
2,872.00	29.43	95.59	2,660.42	-122.64	911.46	108.89	2.53	-2.52	-0.43
2,966.00	30.18	95.90	2,741.99	-127.32	957.95	115.98	0.81	0.80	0.33
3,060.00	31.55	97.40	2,822.67	-132.92	1,005.84	122.52	1.67	1.46	1.60
3,154.00	29.03	96.52	2,903.84	-138.67	1,052.90	128.69	2.72	-2.68	-0.94
3,248.00	29.87	98.68	2,985.69	-144.80	1,098.70	134.21	1.44	0.89	2.30
3,342.00	30.36	96.47	3,067.01	-151.01	1,145.45	139.87	1.29	0.52	-2.35
3,436.00	31.29	97.57	3,147.73	-156.90	1,193.25	146.10	1.16	0.99	1.17
3,530.00	31.33	97.05	3,228.04	-163.11	1,241.70	152.18	0.29	0.04	-0.55
3,624.00	30.89	97.09	3,308.52	-169.09	1,289.90	158.43	0.47	-0.47	0.04
3,719.00	30.45	97.57	3,390.23	-175.27	1,337.96	164.45	0.53	-0.46	0.51
3,813.00	30.58	97.09	3,471.21	-181.36	1,385.30	170.38	0.29	0.14	-0.51
3,907.00	31.33	95.99	3,551.82	-186.86	1,433.34	177.05	1.00	0.80	-1.17
4,001.00	31.24	95.19	3,632.15	-191.62	1,481.92	184.58	0.45	-0.10	-0.85
4,095.00	30.49	96.47	3,712.84	-196.51	1,529.89	191.82	1.06	-0.80	1.36
4,190.00	29.47	98.85	3,795.13	-202.82	1,576.93	197.46	1.65	-1.07	2.51
4,285.00	30.76	100.00	3,877.31	-210.64	1,623.95	201.64	1.49	1.36	1.21
4,379.00	31.86	98.41	3,957.62	-218.44	1,672.16	206.12	1.46	1.17	-1.69
4,472.00	29.12	99.07	4,037.75	-225.60	1,718.80	210.84	2.97	-2.95	0.71

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### Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
4,566.00	27.84	99.16	4,120.37	-232.70	1,763.06	215.02	1.36	-1.36	0.10
4,660.00	28.10	97.57	4,203.40	-239.11	1,806.67	219.71	0.84	0.28	-1.69
4,755.00	29.74	97.35	4,286.55	-245.07	1,852.22	225.31	1.73	1.73	-0.23
4,849.00	31.90	95.11	4,367.27	-250.27	1,900.09	232.23	2.60	2.30	-2.38
4,943.00	32.92	96.74	4,446.63	-255.48	1,950.20	239.70	1.43	1.09	1.73
5,037.00	30.00	97.18	4,526.80	-261.41	1,998.89	246.12	3.12	-3.11	0.47
5,131.00	30.84	96.65	4,607.86	-267.14	2,046.14	252.37	0.94	0.89	-0.56
5,225.00	30.84	98.01	4,688.57	-273.29	2,093.93	258.36	0.74	0.00	1.45
5,319.00	31.73	96.96	4,768.90	-279.64	2,142.33	264.29	1.11	0.95	-1.12
5,413.00	29.96	96.16	4,849.60	-285.15	2,190.20	270.91	1.93	-1.88	-0.85
5,507.00	26.65	94.40	4,932.35	-289.29	2,234.57	277.98	3.63	-3.52	-1.87
5,602.00	25.01	95.02	5,017.86	-292.68	2,275.82	285.00	1.75	-1.73	0.65
5,695.00	21.26	91.18	5,103.37	-294.75	2,312.28	292.11	4.34	-4.03	-4.13
5,789.00	18.03	92.07	5,191.89	-295.63	2,343.86	299.15	3.45	-3.44	0.95
5,883.00	15.91	91.45	5,281.79	-296.48	2,371.28	305.17	2.26	-2.26	-0.66
6,001.00	14.18	92.90	5,395.74	-297.62	2,401.89	311.71	1.50	-1.47	1.23
6,095.00	13.26	97.75	5,487.06	-299.66	2,424.07	315.28	1.57	-0.98	5.16
6,189.00	15.16	102.69	5,578.18	-303.81	2,446.75	316.92	2.40	2.02	5.26
6,283.00	13.21	100.44	5,669.31	-308.46	2,469.30	318.05	2.16	-2.07	-2.39
6,376.00	11.58	98.50	5,760.14	-311.76	2,488.99	319.77	1.81	-1.75	-2.09
6,471.00	9.85	97.09	5,853.48	-314.18	2,506.48	321.80	1.84	-1.82	-1.48
6,565.00	8.00	96.38	5,946.34	-315.90	2,520.96	323.75	1.97	-1.97	-0.76
6,659.00	6.45	94.53	6,039.59	-317.04	2,532.73	325.58	1.67	-1.65	-1.97
6,753.00	5.30	93.56	6,133.10	-317.73	2,542.32	327.32	1.23	-1.22	-1.03
6,847.00	2.65	100.44	6,226.86	-318.39	2,548.79	328.29	2.86	-2.82	7.32
6,941.00	2.70	87.26	6,320.76	-318.68	2,553.14	329.10	0.66	0.05	-14.02
7,035.00	0.75	54.78	6,414.72	-318.22	2,555.86	330.22	2.24	-2.07	-34.55
7,129.00	0.88	57.12	6,508.71	-317.47	2,556.97	331.22	0.14	0.14	2.49
7,223.00	1.28	50.73	6,602.69	-316.41	2,558.39	332.60	0.44	0.43	-6.80
7,318.00	3.05	20.54	6,697.62	-313.38	2,560.09	335.97	2.16	1.86	-31.78
7,412.00	14.54	11.07	6,790.36	-299.41	2,563.25	350.28	12.28	12.22	-10.07
7,506.00	21.83	17.72	6,879.62	-271.14	2,570.84	379.55	8.05	7.76	7.07
7,594.15	30.00	13.79	6,958.84	-234.06	2,581.10	418.02	9.46	9.27	-4.46
<b>30°Inclination @ 7594'MD</b>									
7,599.00	30.45	13.63	6,963.03	-231.69	2,581.68	420.46	9.46	9.32	-3.28
7,669.13	36.57	7.57	7,021.50	-193.66	2,588.63	459.02	9.93	8.73	-8.64
<b>Crossing Section 17 @ 7669'MD</b>									
7,693.00	38.71	5.90	7,040.40	-179.19	2,590.33	473.46	9.93	8.97	-7.00
7,787.00	47.50	0.13	7,108.99	-115.15	2,593.44	536.24	10.24	9.35	-6.14
7,881.00	52.76	358.76	7,169.23	-43.03	2,592.71	605.89	5.71	5.60	-1.46
7,975.00	57.31	358.41	7,223.08	33.96	2,590.80	679.96	4.85	4.84	-0.37
8,068.00	64.56	357.70	7,268.23	115.14	2,588.03	757.88	7.82	7.80	-0.76
8,141.68	70.00	357.91	7,296.68	183.03	2,585.43	822.97	7.39	7.38	0.29
<b>70°Inclination @ 8141'MD</b>									

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8,162.00	71.50	357.97	7,303.38	202.20	2,584.74	841.36	7.39	7.38	0.28
8,256.00	81.62	359.51	7,325.20	293.48	2,582.76	929.25	10.88	10.77	1.64
8,350.00	86.66	358.76	7,334.79	386.95	2,581.35	1,019.41	5.42	5.36	-0.80
8,443.00	87.89	357.88	7,339.21	479.80	2,578.62	1,108.63	1.63	1.32	-0.95
8,537.00	89.70	358.98	7,341.19	573.74	2,576.05	1,198.95	2.25	1.93	1.17
8,630.00	89.97	357.13	7,341.46	666.68	2,572.89	1,288.16	2.01	0.29	-1.99
8,724.00	90.50	359.73	7,341.07	760.64	2,570.32	1,378.50	2.82	0.56	2.77
8,819.00	90.81	2.11	7,339.99	855.61	2,571.84	1,470.84	2.53	0.33	2.51
8,914.00	91.38	4.14	7,338.17	950.45	2,577.02	1,563.97	2.22	0.60	2.14
9,008.00	91.91	0.52	7,335.47	1,044.32	2,580.84	1,655.81	3.89	0.56	-3.85
9,103.00	91.07	359.69	7,333.00	1,139.28	2,581.01	1,747.81	1.24	-0.88	-0.87
9,196.00	90.72	0.17	7,331.55	1,232.27	2,580.90	1,837.82	0.64	-0.38	0.52
9,290.00	90.72	358.94	7,330.37	1,326.26	2,580.17	1,928.65	1.31	0.00	-1.31
9,385.00	90.59	358.54	7,329.28	1,421.23	2,578.08	2,020.09	0.44	-0.14	-0.42
9,480.00	90.46	358.23	7,328.41	1,516.19	2,575.40	2,111.37	0.35	-0.14	-0.33
9,574.00	90.41	357.40	7,327.70	1,610.12	2,571.82	2,201.43	0.88	-0.05	-0.88
9,669.00	89.97	356.07	7,327.38	1,704.96	2,566.41	2,291.91	1.47	-0.46	-1.40
9,762.00	90.06	358.10	7,327.36	1,797.83	2,561.68	2,380.66	2.18	0.10	2.18
9,856.00	90.28	357.92	7,327.08	1,891.78	2,558.41	2,470.81	0.30	0.23	-0.19
9,951.00	90.37	357.62	7,326.54	1,986.70	2,554.72	2,561.81	0.33	0.09	-0.32
10,045.00	89.93	359.38	7,326.29	2,080.67	2,552.26	2,652.18	1.93	-0.47	1.87
10,139.00	90.06	359.51	7,326.30	2,174.66	2,551.35	2,742.97	0.20	0.14	0.14
10,233.00	90.06	359.25	7,326.20	2,268.66	2,550.33	2,833.73	0.28	0.00	-0.28
10,327.00	90.01	358.81	7,326.15	2,362.64	2,548.74	2,924.34	0.47	-0.05	-0.47
10,421.00	89.97	359.25	7,326.16	2,456.63	2,547.15	3,014.95	0.47	-0.04	0.47
10,515.00	89.40	0.08	7,326.68	2,550.62	2,546.60	3,105.83	1.07	-0.61	0.88
10,608.00	90.72	0.74	7,326.58	2,643.62	2,547.26	3,196.04	1.59	1.42	0.71
10,702.00	90.77	0.92	7,325.36	2,737.60	2,548.62	3,287.39	0.20	0.05	0.19
10,796.00	90.90	0.88	7,323.99	2,831.58	2,550.10	3,378.76	0.14	0.14	-0.04
10,891.00	90.85	0.66	7,322.54	2,926.56	2,551.38	3,471.04	0.24	-0.05	-0.23
10,985.00	90.77	0.35	7,321.21	3,020.55	2,552.21	3,562.26	0.34	-0.09	-0.33
11,079.00	90.94	0.08	7,319.81	3,114.54	2,552.56	3,653.36	0.34	0.18	-0.29
11,174.00	90.94	0.13	7,318.25	3,209.52	2,552.73	3,745.38	0.05	0.00	0.05
11,268.00	91.03	359.91	7,316.63	3,303.51	2,552.77	3,836.39	0.25	0.10	-0.23
11,362.00	90.19	0.13	7,315.63	3,397.50	2,552.80	3,927.42	0.92	-0.89	0.23
11,457.00	89.79	359.60	7,315.65	3,492.50	2,552.57	4,019.35	0.70	-0.42	-0.56
11,551.00	90.10	0.74	7,315.74	3,586.50	2,552.85	4,110.44	1.26	0.33	1.21
11,644.00	90.28	1.27	7,315.43	3,679.48	2,554.48	4,200.88	0.60	0.19	0.57
11,739.00	90.32	1.76	7,314.93	3,774.45	2,557.00	4,293.47	0.52	0.04	0.52
11,833.00	90.28	2.07	7,314.44	3,868.40	2,560.14	4,385.22	0.33	-0.04	0.33
11,928.00	90.06	0.70	7,314.16	3,963.37	2,562.43	4,477.75	1.46	-0.23	-1.44
12,021.00	90.32	0.48	7,313.85	4,056.36	2,563.39	4,568.04	0.37	0.28	-0.24
12,115.00	90.41	359.82	7,313.25	4,150.36	2,563.64	4,659.12	0.71	0.10	-0.70

## Survey Report

<b>Company:</b>	Extraction Oil & Gas	<b>Local Co-ordinate Reference:</b>	Well Rinn Valley East N17-20-11N
<b>Project:</b>	Weld County, CO (NAD83)	<b>TVD Reference:</b>	KB=25 @ 4962.10ft (Patterson #346)
<b>Site:</b>	Rinn Valley East Pad (Sec.18-T2N-R68W)	<b>MD Reference:</b>	KB=25 @ 4962.10ft (Patterson #346)
<b>Well:</b>	Rinn Valley East N17-20-11N	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<b>Database:</b>	EDM 5000.1

### Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
12,209.00	90.23	359.69	7,312.73	4,244.35	2,563.24	4,750.04	0.24	-0.19	-0.14
12,303.00	89.93	358.94	7,312.60	4,338.35	2,562.11	4,840.77	0.86	-0.32	-0.80
12,397.00	89.79	359.91	7,312.83	4,432.34	2,561.17	4,931.55	1.04	-0.15	1.03
12,491.00	90.10	0.13	7,312.92	4,526.34	2,561.20	5,022.58	0.40	0.33	0.23
12,585.00	92.44	0.44	7,310.83	4,620.31	2,561.67	5,113.69	2.51	2.49	0.33
12,678.00	92.31	0.79	7,306.98	4,713.22	2,562.67	5,203.90	0.40	-0.14	0.38
12,773.00	92.36	0.70	7,303.11	4,808.14	2,563.90	5,296.12	0.11	0.05	-0.09
12,867.00	91.21	1.85	7,300.18	4,902.07	2,565.99	5,387.59	1.73	-1.22	1.22
12,961.00	91.65	3.21	7,297.83	4,995.94	2,570.14	5,479.53	1.52	0.47	1.45
13,008.79	90.64	2.79	7,296.88	5,043.66	2,572.64	5,526.36	2.29	-2.12	-0.88
<b>Crossing Section 17 &amp; 8 @ 13008'MD</b>									
13,055.00	89.66	2.38	7,296.76	5,089.82	2,574.72	5,571.57	2.29	-2.12	-0.88
13,149.00	89.53	2.33	7,297.42	5,183.74	2,578.58	5,663.48	0.15	-0.14	-0.05
13,243.00	88.38	1.98	7,299.14	5,277.65	2,582.12	5,755.30	1.28	-1.22	-0.37
13,337.00	90.50	1.85	7,300.06	5,371.59	2,585.26	5,847.05	2.26	2.26	-0.14
13,431.00	90.50	359.42	7,299.24	5,465.57	2,586.30	5,938.31	2.59	0.00	-2.59
13,526.00	91.03	359.33	7,297.97	5,560.56	2,585.26	6,030.03	0.57	0.56	-0.09
13,620.00	89.40	359.38	7,297.62	5,654.55	2,584.21	6,120.78	1.73	-1.73	0.05
13,714.00	88.78	358.10	7,299.11	5,748.51	2,582.14	6,211.25	1.51	-0.66	-1.36
13,809.00	91.03	359.25	7,299.27	5,843.48	2,579.94	6,302.65	2.66	2.37	1.21
13,902.00	90.59	358.54	7,297.95	5,936.45	2,578.15	6,392.23	0.90	-0.47	-0.76
13,995.00	91.96	357.84	7,295.88	6,029.38	2,575.21	6,481.48	1.65	1.47	-0.75
14,089.00	91.38	357.40	7,293.14	6,123.26	2,571.31	6,571.41	0.77	-0.62	-0.47
14,184.00	90.10	358.85	7,291.92	6,218.20	2,568.20	6,662.56	2.04	-1.35	1.53
14,277.00	90.19	358.32	7,291.68	6,311.17	2,565.91	6,752.01	0.58	0.10	-0.57
14,371.00	90.72	0.04	7,290.93	6,405.15	2,564.56	6,842.68	1.91	0.56	1.83
14,465.00	90.50	359.55	7,289.93	6,499.14	2,564.23	6,933.61	0.57	-0.23	-0.52
14,559.00	90.59	358.98	7,289.04	6,593.13	2,563.02	7,024.32	0.61	0.10	-0.61
14,653.00	90.68	358.19	7,288.00	6,687.10	2,560.70	7,114.73	0.85	0.10	-0.84
14,747.00	90.54	359.55	7,287.00	6,781.07	2,558.85	7,205.26	1.45	-0.15	1.45
14,841.00	91.12	0.57	7,285.63	6,875.06	2,558.94	7,296.30	1.25	0.62	1.09
14,936.00	91.03	0.39	7,283.85	6,970.04	2,559.74	7,388.46	0.21	-0.09	-0.19
15,029.00	91.07	0.79	7,282.15	7,063.02	2,560.70	7,478.74	0.43	0.04	0.43
15,124.00	91.21	1.01	7,280.26	7,157.99	2,562.19	7,571.07	0.27	0.15	0.23
15,312.00	91.21	0.52	7,276.29	7,345.93	2,564.70	7,753.68	0.26	0.00	-0.26
15,405.00	91.30	0.44	7,274.25	7,438.90	2,565.48	7,843.90	0.13	0.10	-0.09
15,499.00	91.30	1.01	7,272.12	7,532.87	2,566.67	7,935.19	0.61	0.00	0.61
15,593.00	91.16	0.88	7,270.10	7,626.84	2,568.22	8,026.56	0.20	-0.15	-0.14
15,687.00	91.34	0.48	7,268.05	7,720.81	2,569.33	8,117.83	0.47	0.19	-0.43
15,782.00	91.47	1.14	7,265.72	7,815.77	2,570.67	8,210.12	0.71	0.14	0.69
15,876.00	91.38	359.69	7,263.38	7,909.73	2,571.35	8,301.28	1.55	-0.10	-1.54
15,970.00	90.85	359.25	7,261.55	8,003.71	2,570.49	8,392.06	0.73	-0.56	-0.47
16,065.00	91.07	359.42	7,259.96	8,098.69	2,569.38	8,483.76	0.29	0.23	0.18
16,158.00	89.53	0.22	7,259.47	8,191.69	2,569.09	8,573.73	1.87	-1.66	0.86

## Survey Report

<b>Company:</b>	Extraction Oil & Gas	<b>Local Co-ordinate Reference:</b>	Well Rinn Valley East N17-20-11N
<b>Project:</b>	Weld County, CO (NAD83)	<b>TVD Reference:</b>	KB=25 @ 4962.10ft (Patterson #346)
<b>Site:</b>	Rinn Valley East Pad (Sec.18-T2N-R68W)	<b>MD Reference:</b>	KB=25 @ 4962.10ft (Patterson #346)
<b>Well:</b>	Rinn Valley East N17-20-11N	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<b>Database:</b>	EDM 5000.1

### Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
16,252.00	89.66	359.78	7,260.14	8,285.68	2,569.09	8,664.75	0.49	0.14	-0.47
16,345.00	90.01	359.60	7,260.41	8,378.68	2,568.59	8,754.67	0.42	0.38	-0.19
16,439.00	90.10	359.38	7,260.32	8,472.68	2,567.75	8,845.48	0.25	0.10	-0.23
16,534.00	90.32	358.32	7,259.97	8,567.66	2,565.84	8,936.97	1.14	0.23	-1.12
16,628.00	90.37	359.20	7,259.40	8,661.63	2,563.81	9,027.46	0.94	0.05	0.94
16,722.00	90.72	358.28	7,258.51	8,755.60	2,561.74	9,117.94	1.05	0.37	-0.98
16,816.00	91.96	359.60	7,256.31	8,849.56	2,560.00	9,208.48	1.93	1.32	1.40
16,911.00	89.97	0.39	7,254.71	8,944.54	2,560.00	9,300.45	2.25	-2.09	0.83
17,005.00	90.01	359.55	7,254.73	9,038.54	2,559.95	9,391.46	0.89	0.04	-0.89
17,099.00	90.46	1.54	7,254.34	9,132.53	2,560.84	9,482.69	2.17	0.48	2.12
17,193.00	90.94	2.38	7,253.19	9,226.47	2,564.06	9,574.46	1.03	0.51	0.89
17,287.00	91.38	2.60	7,251.29	9,320.36	2,568.14	9,666.39	0.52	0.47	0.23
17,382.00	91.78	2.07	7,248.67	9,415.24	2,572.01	9,759.24	0.70	0.42	-0.56
17,476.00	91.87	2.02	7,245.68	9,509.13	2,575.36	9,850.99	0.11	0.10	-0.05
17,570.00	92.14	1.58	7,242.39	9,603.03	2,578.31	9,942.65	0.55	0.29	-0.47
17,664.00	92.18	1.36	7,238.85	9,696.93	2,580.72	10,034.18	0.24	0.04	-0.23
17,758.00	92.53	0.74	7,234.98	9,790.84	2,582.44	10,125.53	0.76	0.37	-0.66
<b>Last MWD Survey @ 17758'MD</b>									
17,880.00	92.53	0.74	7,229.60	9,912.71	2,584.02	10,243.94	0.00	0.00	0.00
<b>PTB @ TD @ 17880'MD (483'FNL &amp; 2101'FWL)</b>									

### Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
1,609.00	1,565.21	-37.22	289.44	Tie in to Surface Surveys @ 1609'MD
1,745.00	1,686.17	-42.69	351.34	First MWD Survey @ 1745'MD
7,594.15	6,958.84	-234.06	2,581.10	30°Inclination @ 7594'MD
7,669.13	7,021.50	-193.66	2,588.63	Crossing Section 17 @ 7669'MD
8,141.68	7,296.68	183.03	2,585.43	70°Inclination @ 8141'MD
13,008.79	7,296.88	5,043.66	2,572.64	Crossing Section 17 & 8 @ 13008'MD
17,758.00	7,234.98	9,790.84	2,582.44	Last MWD Survey @ 17758'MD
17,880.00	7,229.60	9,912.71	2,584.02	PTB @ TD @ 17880'MD (483'FNL & 2101'FWL)

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