

# **Extraction Oil & Gas**

**Weld County, CO (NAD83)**

**Sec 07-T01S-R68W Livingston Pad**

**Livingston S19-25-05C**

**Wellbore #1**

**Design: Wellbore #1**

## **Standard Survey Report**

**02 October, 2019**

## Survey Report

<b>Company:</b>	Extraction Oil & Gas	<b>Local Co-ordinate Reference:</b>	Well Livingston S19-25-05C
<b>Project:</b>	Weld County, CO (NAD83)	<b>TVD Reference:</b>	KB @ 5348.10usft (Patterson 901)
<b>Site:</b>	Sec 07-T01S-R68W Livingston Pad	<b>MD Reference:</b>	KB @ 5348.10usft (Patterson 901)
<b>Well:</b>	Livingston S19-25-05C	<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 5000.15 Single User Db

<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		Sec 07-T01S-R68W Livingston Pad						
Site Position:		Northing:	1,238,290.24	usft	Latitude:	39.986624		
From:	Lat/Long	Easting:	3,125,301.58	usft	Longitude:	-105.052826		
Position Uncertainty:	0.00	usft	Slot Radius:	13-3/16	"	Grid Convergence:	0.29	°

Well		Livingston S19-25-05C				
Well Position	+N/-S	0.00 usft	Northing:	1,235,372.43 usft	Latitude:	39.978563
	+E/-W	0.00 usft	Easting:	3,128,948.42 usft	Longitude:	-105.039865
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	5,319.10 usft

<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>
	IGRF2015	6/28/2019	8.10	66.42	51,868.58306785

<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) (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Direction (°)</b>	
	0.00	0.00	0.00	189.24	

<b>Survey Program</b>	<b>Date</b>	10/2/2019			
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
143.00	1,579.00	Surface Surveys (Wellbore #1)	MWD	MWD - Standard	
1,670.00	21,457.00	Atlas MWD Surveys (Wellbore #1)	MWD	MWD - Standard	

<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>	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
143.00	0.62	125.53	143.00	-0.45	0.63	0.34	0.43	0.43	0.00	
230.00	0.53	126.06	229.99	-0.96	1.34	0.73	0.10	-0.10	0.61	
317.00	0.66	120.70	316.99	-1.45	2.09	1.10	0.16	0.15	-6.16	
405.00	0.62	120.61	404.98	-1.95	2.94	1.46	0.05	-0.05	-0.10	
492.00	0.92	283.91	491.98	-2.03	2.67	1.57	1.75	0.34	187.70	
579.00	1.67	283.91	578.96	-1.55	0.76	1.41	0.86	0.86	0.00	
666.00	2.90	286.72	665.89	-0.62	-2.58	1.02	1.42	1.41	3.23	
754.00	4.44	296.39	753.70	1.54	-7.76	-0.27	1.88	1.75	10.99	
841.00	6.78	296.13	840.28	5.30	-15.39	-2.76	2.69	2.69	-0.30	

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<b>Site:</b>	Sec 07-T01S-R68W Livingston Pad	<b>MD Reference:</b>	KB @ 5348.10usft (Patterson 901)
<b>Well:</b>	Livingston S19-25-05C	<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 5000.15 Single User Db

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)
928.00	8.74	293.32	926.48	10.18	-26.07	-5.86	2.29	2.25	-3.23
1,016.00	10.42	293.58	1,013.25	16.01	-39.51	-9.46	1.91	1.91	0.30
1,103.00	11.16	293.58	1,098.71	22.52	-54.43	-13.49	0.85	0.85	0.00
1,190.00	13.05	289.54	1,183.77	29.18	-71.41	-17.33	2.38	2.17	-4.64
1,277.00	15.07	289.54	1,268.16	36.25	-91.33	-21.11	2.32	2.32	0.00
1,365.00	16.88	287.69	1,352.76	43.96	-114.28	-25.04	2.14	2.06	-2.10
1,452.00	17.71	286.28	1,435.83	51.50	-139.02	-28.51	1.07	0.95	-1.62
1,539.00	18.94	286.81	1,518.42	59.30	-165.24	-32.00	1.43	1.41	0.61
1,579.00	19.25	287.51	1,556.21	63.16	-177.74	-33.80	0.96	0.78	1.75
Tie into Surface Surveys									
1,670.00	19.40	288.54	1,642.09	72.48	-206.38	-38.40	0.41	0.16	1.13
First MWD Survey @ 1670' MD									
1,765.00	19.13	287.88	1,731.77	82.27	-236.15	-43.29	0.37	-0.28	-0.69
1,861.00	18.47	286.47	1,822.65	91.41	-265.70	-47.57	0.83	-0.69	-1.47
1,956.00	17.41	284.27	1,913.03	99.18	-293.91	-50.71	1.32	-1.12	-2.32
2,051.00	19.05	291.67	2,003.27	108.41	-322.10	-55.29	2.98	1.73	7.79
2,146.00	17.94	290.31	2,093.36	119.22	-350.23	-61.44	1.25	-1.17	-1.43
2,241.00	20.64	298.28	2,183.03	132.23	-378.70	-69.71	3.96	2.84	8.39
2,429.00	19.13	297.93	2,359.82	162.36	-435.10	-90.40	0.81	-0.80	-0.19
2,524.00	21.08	295.24	2,449.03	176.94	-464.31	-100.10	2.27	2.05	-2.83
2,619.00	22.93	290.53	2,537.11	190.72	-497.10	-108.43	2.69	1.95	-4.96
2,715.00	21.30	289.56	2,626.05	203.11	-531.05	-115.22	1.74	-1.70	-1.01
2,809.00	19.66	287.27	2,714.10	213.53	-562.24	-120.48	1.94	-1.74	-2.44
2,904.00	16.84	284.84	2,804.32	221.80	-590.81	-124.06	3.07	-2.97	-2.56
2,999.00	18.56	287.49	2,894.82	229.86	-618.53	-127.57	2.00	1.81	2.79
3,094.00	16.75	286.56	2,985.34	238.31	-646.07	-131.49	1.93	-1.91	-0.98
3,190.00	19.05	287.09	3,076.69	246.86	-674.31	-135.39	2.40	2.40	0.55
3,285.00	17.23	286.30	3,166.96	255.36	-702.64	-139.24	1.93	-1.92	-0.83
3,380.00	19.40	283.30	3,257.15	262.94	-731.50	-142.09	2.49	2.28	-3.16
3,475.00	17.19	282.33	3,347.34	269.57	-760.57	-143.96	2.35	-2.33	-1.02
3,570.00	17.50	286.47	3,438.02	276.62	-787.99	-146.51	1.34	0.33	4.36
3,666.00	15.95	288.51	3,529.96	284.90	-814.34	-150.46	1.73	-1.61	2.13
3,761.00	18.74	293.17	3,620.63	295.05	-840.75	-156.23	3.28	2.94	4.91
3,857.00	17.01	292.86	3,712.00	306.57	-867.87	-163.25	1.80	-1.80	-0.32
3,952.00	17.59	292.78	3,802.70	317.53	-893.91	-169.89	0.61	0.61	-0.08
4,047.00	19.09	292.64	3,892.87	329.07	-921.48	-176.85	1.58	1.58	-0.15
4,142.00	16.57	292.55	3,983.30	340.25	-948.34	-183.57	2.65	-2.65	-0.09
4,238.00	17.32	291.85	4,075.13	350.81	-974.24	-189.84	0.81	0.78	-0.73
4,333.00	18.96	287.09	4,165.41	360.61	-1,002.12	-195.04	2.33	1.73	-5.01
4,428.00	20.72	282.90	4,254.77	368.90	-1,033.26	-198.22	2.38	1.85	-4.41
4,523.00	17.72	281.93	4,344.47	375.64	-1,063.80	-199.97	3.18	-3.16	-1.02
4,619.00	18.07	287.44	4,435.83	383.13	-1,092.30	-202.78	1.80	0.36	5.74
4,714.00	18.43	289.07	4,526.05	392.45	-1,120.54	-207.45	0.66	0.38	1.72

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<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<b>Database:</b>	EDM 5000.15 Single User Db

Survey										
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4,809.00	20.06	289.56	4,615.74	402.81	-1,150.09	-212.93	1.72	1.72	0.52	
4,905.00	17.90	288.15	4,706.52	412.92	-1,179.63	-218.17	2.30	-2.25	-1.47	
5,000.00	19.66	288.50	4,796.46	422.54	-1,208.66	-223.00	1.86	1.85	0.37	
5,096.00	17.41	286.83	4,887.47	431.82	-1,237.72	-227.50	2.41	-2.34	-1.74	
5,192.00	18.25	283.96	4,978.86	439.61	-1,266.06	-230.63	1.27	0.88	-2.99	
5,286.00	19.35	286.47	5,067.85	447.57	-1,295.28	-233.80	1.45	1.17	2.67	
5,381.00	18.12	286.56	5,157.81	456.25	-1,324.53	-237.67	1.30	-1.29	0.09	
5,477.00	20.28	288.72	5,248.47	465.84	-1,354.60	-242.31	2.37	2.25	2.25	
5,572.00	17.94	285.37	5,338.23	475.01	-1,384.31	-246.58	2.72	-2.46	-3.53	
5,668.00	18.34	287.27	5,429.46	483.41	-1,412.99	-250.27	0.74	0.42	1.98	
5,764.00	19.97	291.19	5,520.14	493.82	-1,442.70	-255.78	2.16	1.70	4.08	
5,859.00	18.78	289.16	5,609.76	504.70	-1,472.27	-261.77	1.44	-1.25	-2.14	
5,954.00	20.59	292.11	5,699.21	516.01	-1,502.20	-268.13	2.17	1.91	3.11	
6,050.00	19.84	289.51	5,789.30	527.81	-1,533.19	-274.79	1.22	-0.78	-2.71	
6,145.00	17.63	283.87	5,879.26	536.64	-1,562.36	-278.83	3.01	-2.33	-5.94	
6,241.00	17.59	289.43	5,970.77	544.95	-1,590.16	-282.57	1.75	-0.04	5.79	
6,336.00	20.68	293.70	6,060.52	556.47	-1,619.06	-289.30	3.57	3.25	4.49	
6,431.00	19.18	291.67	6,149.83	568.98	-1,648.93	-296.85	1.74	-1.58	-2.14	
6,526.00	16.92	290.04	6,240.15	579.48	-1,676.42	-302.80	2.44	-2.38	-1.72	
6,621.00	17.28	290.97	6,330.95	589.27	-1,702.58	-308.26	0.48	0.38	0.98	
6,717.00	18.43	293.17	6,422.32	600.34	-1,729.85	-314.81	1.39	1.20	2.29	
6,812.00	17.10	296.61	6,512.79	612.51	-1,756.14	-322.60	1.78	-1.40	3.62	
6,930.00	17.50	292.33	6,625.46	627.02	-1,788.07	-331.80	1.13	0.34	-3.63	
7,026.00	19.09	293.35	6,716.60	638.72	-1,815.83	-338.89	1.69	1.66	1.06	
7,121.00	19.31	293.70	6,806.32	651.20	-1,844.48	-346.60	0.26	0.23	0.37	
7,216.00	20.11	289.56	6,895.76	662.98	-1,874.25	-353.45	1.69	0.84	-4.36	
7,311.00	17.28	287.84	6,985.74	672.77	-1,903.08	-358.49	3.03	-2.98	-1.81	
7,407.00	14.63	287.75	7,078.03	680.84	-1,928.20	-362.42	2.76	-2.76	-0.09	
7,502.00	11.62	286.34	7,170.54	687.19	-1,948.81	-365.38	3.19	-3.17	-1.48	
7,598.00	9.15	283.26	7,264.96	691.66	-1,965.52	-367.11	2.64	-2.57	-3.21	
7,693.00	7.20	282.60	7,358.99	694.69	-1,978.69	-367.98	2.05	-2.05	-0.69	
7,789.00	2.61	287.80	7,454.61	696.67	-1,986.64	-368.66	4.80	-4.78	5.42	
7,884.00	0.40	40.18	7,549.58	697.59	-1,988.49	-369.27	2.93	-2.33	118.29	
7,979.00	0.40	168.77	7,644.58	697.51	-1,988.21	-369.24	0.76	0.00	135.36	
8,075.00	5.04	174.85	7,740.44	692.98	-1,987.77	-364.84	4.84	4.83	6.33	
8,170.00	13.57	178.16	7,834.11	677.66	-1,987.03	-349.84	8.99	8.98	3.48	
8,266.00	23.69	175.73	7,924.96	647.09	-1,985.23	-319.95	10.57	10.54	-2.53	
8,348.80	30.00	175.73	7,998.80	609.82	-1,982.45	-283.61	7.62	7.62	0.00	
30° Inclination @ 8348.80' MD										
8,361.00	30.93	175.73	8,009.32	603.65	-1,981.99	-277.60	7.62	7.62	0.00	
8,456.00	39.42	178.73	8,086.90	549.05	-1,979.49	-224.10	9.12	8.94	3.16	
8,551.00	48.52	184.19	8,155.23	483.24	-1,981.43	-158.84	10.37	9.58	5.75	
8,647.00	58.42	183.40	8,212.30	406.36	-1,986.50	-82.14	10.33	10.31	-0.82	
8,743.00	65.97	180.01	8,257.06	321.56	-1,988.93	1.95	8.46	7.86	-3.53	

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8,777.09	70.00	179.51	8,269.84	289.96	-1,988.80	33.11	11.90	11.82	-1.46
70° Inclination @ 8777.09' MD									
8,838.00	77.20	178.68	8,287.02	231.58	-1,987.87	90.59	11.90	11.82	-1.37
8,934.00	89.40	178.42	8,298.20	136.44	-1,985.46	184.11	12.71	12.71	-0.27
9,028.00	90.41	177.05	8,298.36	42.52	-1,981.74	276.21	1.81	1.07	-1.46
9,124.00	89.88	178.24	8,298.12	-53.40	-1,977.80	370.25	1.36	-0.55	1.24
9,323.00	91.21	178.07	8,296.22	-252.28	-1,971.39	565.53	0.67	0.67	-0.09
9,418.00	90.41	179.30	8,294.88	-347.24	-1,969.21	658.91	1.54	-0.84	1.29
9,513.00	89.97	178.60	8,294.56	-442.22	-1,967.47	752.38	0.87	-0.46	-0.74
9,608.00	89.79	179.17	8,294.76	-537.21	-1,965.62	845.83	0.63	-0.19	0.60
9,703.00	90.85	179.39	8,294.23	-632.20	-1,964.43	939.40	1.14	1.12	0.23
9,797.00	91.07	178.91	8,292.66	-726.17	-1,963.04	1,031.93	0.56	0.23	-0.51
9,890.00	91.65	178.38	8,290.45	-819.12	-1,960.84	1,123.32	0.84	0.62	-0.57
9,986.00	86.57	181.20	8,291.94	-915.07	-1,960.48	1,217.96	6.05	-5.29	2.94
10,081.00	86.66	180.10	8,297.55	-1,009.89	-1,961.56	1,311.73	1.16	0.09	-1.16
10,176.00	86.26	179.39	8,303.42	-1,104.71	-1,961.14	1,405.25	0.86	-0.42	-0.75
10,271.00	89.79	179.43	8,306.69	-1,199.63	-1,960.16	1,498.79	3.72	3.72	0.04
10,367.00	89.62	179.30	8,307.18	-1,295.63	-1,959.10	1,593.36	0.22	-0.18	-0.14
10,461.00	89.79	177.45	8,307.67	-1,389.58	-1,956.43	1,685.67	1.98	0.18	-1.97
10,557.00	89.93	180.05	8,307.90	-1,485.55	-1,954.34	1,780.06	2.71	0.15	2.71
10,652.00	90.06	181.81	8,307.91	-1,580.53	-1,955.88	1,874.06	1.86	0.14	1.85
10,747.00	89.97	180.32	8,307.89	-1,675.52	-1,957.65	1,968.09	1.57	-0.09	-1.57
10,842.00	89.66	181.86	8,308.19	-1,770.49	-1,959.45	2,062.13	1.65	-0.33	1.62
10,937.00	87.41	181.24	8,310.62	-1,865.42	-1,962.02	2,156.24	2.46	-2.37	-0.65
11,033.00	87.32	179.83	8,315.04	-1,961.31	-1,962.92	2,251.03	1.47	-0.09	-1.47
11,128.00	89.35	181.86	8,317.80	-2,056.25	-1,964.32	2,344.96	3.02	2.14	2.14
11,223.00	90.46	181.86	8,317.95	-2,151.20	-1,967.40	2,439.17	1.17	1.17	0.00
11,318.00	90.77	180.93	8,316.93	-2,246.17	-1,969.71	2,533.28	1.03	0.33	-0.98
11,407.34	90.81	179.91	8,315.70	-2,335.50	-1,970.37	2,621.55	1.15	0.04	-1.15
Cross @ 11407.34' MD									
11,414.00	90.81	179.83	8,315.61	-2,342.15	-1,970.35	2,628.12	1.15	0.04	-1.15
11,509.00	91.03	178.91	8,314.09	-2,437.14	-1,969.31	2,721.70	1.00	0.23	-0.97
11,604.00	90.41	178.99	8,312.89	-2,532.11	-1,967.57	2,815.17	0.66	-0.65	0.08
11,699.00	88.64	182.25	8,313.68	-2,627.09	-1,968.59	2,909.08	3.90	-1.86	3.43
11,794.00	89.26	181.86	8,315.42	-2,722.01	-1,972.00	3,003.31	0.77	0.65	-0.41
11,890.00	89.79	180.98	8,316.22	-2,817.97	-1,974.38	3,098.42	1.07	0.55	-0.92
11,985.00	90.19	180.67	8,316.23	-2,912.96	-1,975.75	3,192.39	0.53	0.42	-0.33
12,081.00	90.32	180.36	8,315.81	-3,008.96	-1,976.61	3,287.28	0.35	0.14	-0.32
12,176.00	90.50	179.87	8,315.13	-3,103.96	-1,976.80	3,381.08	0.55	0.19	-0.52
12,272.00	90.68	179.04	8,314.14	-3,199.95	-1,975.89	3,475.67	0.88	0.19	-0.86
12,367.00	91.16	177.63	8,312.61	-3,294.89	-1,973.13	3,568.94	1.57	0.51	-1.48
12,463.00	90.54	181.37	8,311.19	-3,390.86	-1,972.29	3,663.53	3.95	-0.65	3.90
12,559.00	90.99	180.84	8,309.91	-3,486.83	-1,974.14	3,758.56	0.72	0.47	-0.55

## Survey Report

<b>Company:</b>	Extraction Oil & Gas	<b>Local Co-ordinate Reference:</b>	Well Livingston S19-25-05C
<b>Project:</b>	Weld County, CO (NAD83)	<b>TVD Reference:</b>	KB @ 5348.10usft (Patterson 901)
<b>Site:</b>	Sec 07-T01S-R68W Livingston Pad	<b>MD Reference:</b>	KB @ 5348.10usft (Patterson 901)
<b>Well:</b>	Livingston S19-25-05C	<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 5000.15 Single User Db

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)
12,654.00	88.51	181.11	8,310.32	-3,581.81	-1,975.76	3,852.56	2.63	-2.61	0.28
12,750.00	89.00	179.61	8,312.41	-3,677.78	-1,976.36	3,947.39	1.64	0.51	-1.56
12,845.00	89.35	178.95	8,313.77	-3,772.76	-1,975.17	4,040.95	0.79	0.37	-0.69
12,940.00	89.35	178.20	8,314.85	-3,867.73	-1,972.80	4,134.30	0.79	0.00	-0.79
13,035.00	89.31	180.18	8,315.96	-3,962.71	-1,971.46	4,227.83	2.08	-0.04	2.08
13,131.00	89.13	182.47	8,317.27	-4,058.67	-1,973.68	4,322.90	2.39	-0.19	2.39
13,227.00	89.44	181.59	8,318.47	-4,154.60	-1,977.08	4,418.13	0.97	0.32	-0.92
13,322.00	90.90	181.51	8,318.19	-4,249.56	-1,979.65	4,512.28	1.54	1.54	-0.08
13,418.00	91.43	181.02	8,316.23	-4,345.52	-1,981.77	4,607.33	0.75	0.55	-0.51
13,513.00	89.31	182.52	8,315.62	-4,440.46	-1,984.70	4,701.51	2.73	-2.23	1.58
13,609.00	89.75	182.47	8,316.41	-4,536.37	-1,988.88	4,796.84	0.46	0.46	-0.05
13,704.00	89.93	181.68	8,316.67	-4,631.30	-1,992.32	4,891.10	0.85	0.19	-0.83
13,799.00	89.09	180.10	8,317.49	-4,726.28	-1,993.80	4,985.09	1.88	-0.88	-1.66
13,895.00	89.26	179.52	8,318.87	-4,822.27	-1,993.48	5,079.78	0.63	0.18	-0.60
13,990.00	89.13	178.86	8,320.20	-4,917.25	-1,992.14	5,173.31	0.71	-0.14	-0.69
14,084.00	89.22	177.27	8,321.56	-5,011.19	-1,988.96	5,265.52	1.69	0.10	-1.69
14,179.00	89.62	177.85	8,322.52	-5,106.10	-1,984.92	5,358.54	0.74	0.42	0.61
14,275.00	89.22	178.95	8,323.49	-5,202.05	-1,982.24	5,452.83	1.22	-0.42	1.15
14,370.00	89.31	178.33	8,324.71	-5,297.02	-1,979.98	5,546.20	0.66	0.09	-0.65
14,465.00	89.88	177.50	8,325.38	-5,391.95	-1,976.53	5,639.34	1.06	0.60	-0.87
14,560.00	88.73	181.68	8,326.53	-5,486.92	-1,975.85	5,732.97	4.56	-1.21	4.40
14,655.00	88.73	181.55	8,328.64	-5,581.86	-1,978.52	5,827.11	0.14	0.00	-0.14
14,750.00	88.82	180.62	8,330.67	-5,676.82	-1,980.32	5,921.12	0.98	0.09	-0.98
14,845.00	89.22	179.48	8,332.29	-5,771.80	-1,980.41	6,014.89	1.27	0.42	-1.20
14,940.00	89.84	181.73	8,333.07	-5,866.79	-1,981.41	6,108.80	2.46	0.65	2.37
15,035.00	89.26	180.32	8,333.82	-5,961.77	-1,983.11	6,202.82	1.60	-0.61	-1.48
15,130.00	89.70	179.83	8,334.68	-6,056.76	-1,983.23	6,296.61	0.69	0.46	-0.52
15,225.00	90.77	184.06	8,334.29	-6,151.68	-1,986.46	6,390.81	4.59	1.13	4.45
15,320.00	91.52	183.71	8,332.39	-6,246.44	-1,992.89	6,485.38	0.87	0.79	-0.37
15,415.00	90.72	183.18	8,330.54	-6,341.25	-1,998.60	6,579.87	1.01	-0.84	-0.56
15,510.00	90.72	181.99	8,329.34	-6,436.15	-2,002.88	6,674.23	1.25	0.00	-1.25
15,606.00	89.57	180.58	8,329.10	-6,532.12	-2,005.03	6,769.30	1.90	-1.20	-1.47
15,701.00	88.91	180.62	8,330.36	-6,627.11	-2,006.03	6,863.21	0.70	-0.69	0.04
15,796.00	86.92	180.76	8,333.82	-6,722.03	-2,007.17	6,957.09	2.10	-2.09	0.15
15,891.00	87.89	180.05	8,338.12	-6,816.93	-2,007.84	7,050.86	1.26	1.02	-0.75
15,986.00	88.29	179.04	8,341.28	-6,911.87	-2,007.09	7,144.45	1.14	0.42	-1.06
16,081.00	88.69	178.38	8,343.79	-7,006.81	-2,004.95	7,237.82	0.81	0.42	-0.69
16,176.00	90.81	182.69	8,344.20	-7,101.78	-2,005.84	7,331.70	5.06	2.23	4.54
16,273.00	91.34	181.68	8,342.38	-7,198.69	-2,009.54	7,427.95	1.18	0.55	-1.04
16,368.00	90.68	178.68	8,340.71	-7,293.67	-2,009.83	7,521.73	3.23	-0.69	-3.16
16,464.00	89.84	179.83	8,340.27	-7,389.65	-2,008.59	7,616.28	1.48	-0.88	1.20
16,558.00	89.75	182.92	8,340.61	-7,483.61	-2,010.84	7,709.38	3.29	-0.10	3.29
16,654.00	89.70	186.40	8,341.07	-7,579.28	-2,018.64	7,805.06	3.63	-0.05	3.63
16,676.85	89.88	186.01	8,341.15	-7,602.00	-2,021.11	7,827.88	1.87	0.79	-1.70

# Survey Report

<b>Company:</b>	Extraction Oil & Gas	<b>Local Co-ordinate Reference:</b>	Well Livingston S19-25-05C
<b>Project:</b>	Weld County, CO (NAD83)	<b>TVD Reference:</b>	KB @ 5348.10usft (Patterson 901)
<b>Site:</b>	Sec 07-T01S-R68W Livingston Pad	<b>MD Reference:</b>	KB @ 5348.10usft (Patterson 901)
<b>Well:</b>	Livingston S19-25-05C	<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 5000.15 Single User Db

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)
<b>Cross @ 16676.85' MD</b>									
16,750.00	90.46	184.77	8,340.93	-7,674.82	-2,027.98	7,900.86	1.87	0.79	-1.70
16,845.00	89.26	182.30	8,341.17	-7,769.63	-2,033.84	7,995.38	2.89	-1.26	-2.60
16,940.00	88.95	181.73	8,342.65	-7,864.56	-2,037.18	8,089.61	0.68	-0.33	-0.60
17,036.00	87.54	181.06	8,345.59	-7,960.48	-2,039.51	8,184.67	1.63	-1.47	-0.70
17,131.00	88.38	180.01	8,348.97	-8,055.42	-2,040.40	8,278.51	1.41	0.88	-1.11
17,226.00	88.91	178.60	8,351.22	-8,150.38	-2,039.25	8,372.06	1.59	0.56	-1.48
17,320.00	89.40	178.02	8,352.60	-8,244.33	-2,036.48	8,464.34	0.81	0.52	-0.62
17,415.00	89.48	178.51	8,353.53	-8,339.28	-2,033.60	8,557.60	0.52	0.08	0.52
17,510.00	89.26	178.91	8,354.58	-8,434.25	-2,031.46	8,651.00	0.48	-0.23	0.42
17,605.00	89.22	178.73	8,355.84	-8,529.22	-2,029.51	8,744.42	0.19	-0.04	-0.19
17,701.00	89.35	178.64	8,357.04	-8,625.19	-2,027.30	8,838.79	0.16	0.14	-0.09
17,796.00	89.35	178.07	8,358.11	-8,720.14	-2,024.58	8,932.07	0.60	0.00	-0.60
17,892.00	89.44	177.94	8,359.13	-8,816.08	-2,021.23	9,026.23	0.16	0.09	-0.14
17,987.00	89.75	178.77	8,359.80	-8,911.04	-2,018.51	9,119.52	0.93	0.33	0.87
18,082.00	89.26	177.94	8,360.62	-9,005.99	-2,015.78	9,212.80	1.01	-0.52	-0.87
18,178.00	89.26	177.41	8,361.86	-9,101.91	-2,011.89	9,306.85	0.55	0.00	-0.55
18,273.00	89.44	177.50	8,362.94	-9,196.81	-2,007.67	9,399.84	0.21	0.19	0.09
18,369.00	89.48	177.45	8,363.84	-9,292.71	-2,003.44	9,493.82	0.07	0.04	-0.05
18,464.00	89.48	177.63	8,364.70	-9,387.62	-1,999.36	9,586.84	0.19	0.00	0.19
18,560.00	89.97	178.02	8,365.16	-9,483.55	-1,995.72	9,680.94	0.65	0.51	0.41
18,656.00	90.10	179.39	8,365.11	-9,579.52	-1,993.55	9,775.32	1.43	0.14	1.43
18,751.00	89.84	179.52	8,365.16	-9,674.52	-1,992.65	9,868.94	0.31	-0.27	0.14
18,847.00	89.97	179.48	8,365.32	-9,770.51	-1,991.81	9,963.55	0.14	0.14	-0.04
18,942.00	90.32	179.39	8,365.07	-9,865.51	-1,990.87	10,057.17	0.38	0.37	-0.09
19,037.00	89.75	178.60	8,365.02	-9,960.49	-1,989.20	10,150.65	1.03	-0.60	-0.83
19,133.00	89.35	179.43	8,365.77	-10,056.47	-1,987.55	10,245.12	0.96	-0.42	0.86
19,228.00	88.33	180.36	8,367.69	-10,151.45	-1,987.38	10,338.84	1.45	-1.07	0.98
19,324.00	88.56	181.33	8,370.30	-10,247.40	-1,988.80	10,433.78	1.04	0.24	1.01
19,420.00	91.30	182.78	8,370.42	-10,343.33	-1,992.24	10,529.01	3.23	2.85	1.51
19,515.00	89.93	181.68	8,369.40	-10,438.25	-1,995.93	10,623.29	1.85	-1.44	-1.16
19,609.00	91.34	179.08	8,368.35	-10,532.23	-1,996.56	10,716.15	3.15	1.50	-2.77
19,701.00	92.05	177.27	8,365.63	-10,624.14	-1,993.63	10,806.40	2.11	0.77	-1.97
19,794.00	89.00	178.11	8,364.78	-10,717.05	-1,989.88	10,897.50	3.40	-3.28	0.90
19,890.00	88.69	182.25	8,366.72	-10,813.01	-1,990.18	10,992.26	4.32	-0.32	4.31
19,984.00	88.56	182.34	8,368.97	-10,906.91	-1,993.95	11,085.55	0.17	-0.14	0.10
20,080.00	87.32	181.20	8,372.42	-11,002.79	-1,996.91	11,180.67	1.75	-1.29	-1.19
20,175.00	88.20	180.98	8,376.14	-11,097.70	-1,998.71	11,274.64	0.95	0.93	-0.23
20,269.00	88.91	180.62	8,378.51	-11,191.66	-2,000.03	11,367.59	0.85	0.76	-0.38
20,364.00	90.54	179.48	8,378.96	-11,286.66	-2,000.11	11,461.36	2.09	1.72	-1.20
20,458.00	92.14	177.94	8,376.76	-11,380.60	-1,997.99	11,553.75	2.36	1.70	-1.64
20,554.00	92.71	177.41	8,372.70	-11,476.44	-1,994.10	11,647.72	0.81	0.59	-0.55
20,648.00	91.03	181.06	8,369.63	-11,570.36	-1,992.85	11,740.22	4.27	-1.79	3.88

## Survey Report

<b>Company:</b>	Extraction Oil & Gas	<b>Local Co-ordinate Reference:</b>	Well Livingston S19-25-05C
<b>Project:</b>	Weld County, CO (NAD83)	<b>TVD Reference:</b>	KB @ 5348.10usft (Patterson 901)
<b>Site:</b>	Sec 07-T01S-R68W Livingston Pad	<b>MD Reference:</b>	KB @ 5348.10usft (Patterson 901)
<b>Well:</b>	Livingston S19-25-05C	<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 5000.15 Single User Db

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)	
20,742.00	91.43	180.62	8,367.62	-11,664.33	-1,994.23	11,833.19	0.63	0.43	-0.47	
20,836.00	89.40	181.68	8,366.94	-11,758.30	-1,996.12	11,926.24	2.44	-2.16	1.13	
20,931.00	90.01	180.32	8,367.43	-11,853.28	-1,997.77	12,020.26	1.57	0.64	-1.43	
21,026.00	90.28	178.73	8,367.18	-11,948.27	-1,996.99	12,113.89	1.70	0.28	-1.67	
21,121.00	89.57	183.00	8,367.31	-12,043.24	-1,998.42	12,207.86	4.56	-0.75	4.49	
21,215.00	90.41	183.58	8,367.33	-12,137.08	-2,003.81	12,301.35	1.09	0.89	0.62	
21,310.00	90.46	182.56	8,366.60	-12,231.94	-2,008.90	12,395.80	1.07	0.05	-1.07	
21,396.00	91.03	181.55	8,365.49	-12,317.88	-2,011.99	12,481.11	1.35	0.66	-1.17	
Last MWD Survey @ 21396' MD										
21,457.00	91.03	181.55	8,364.39	-12,378.85	-2,013.63	12,541.56	0.00	0.00	0.00	
Projection to TD @ 21457' MD 499' FSL/ 1640' FWL										

Design Targets									
Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
30° Inclination @ 8348.8' MD - actual wellpath hits target center - Point	0.00	0.00	7,998.80	609.82	-1,982.45	1,235,971.96	3,126,962.83	39.980237	-105.046939
70° Inclination @ 8777.09' MD - actual wellpath misses target center by 0.01usft at 8777.09usft MD (8269.84 TVD, 289.96 N, -1988.80 E) - Point	0.00	0.00	8,269.84	289.96	-1,988.81	1,235,652.07	3,126,958.13	39.979359	-105.046962
Cross @ 11407.34' MD - actual wellpath hits target center - Point	0.00	0.00	8,315.70	-2,335.50	-1,970.37	1,233,026.74	3,126,990.19	39.972151	-105.046896
Cross @ 16676.85' MD - actual wellpath hits target center - Point	0.00	0.00	8,341.15	-7,602.00	-2,021.11	1,227,760.05	3,126,966.78	39.957694	-105.047075

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
1,579.00	1,556.21	63.16	-177.74	Tie into Surface Surveys	
1,670.00	1,642.09	72.48	-206.38	First MWD Survey @ 1670' MD	
8,348.80	7,998.80	609.82	-1,982.45	30° Inclination @ 8348.80' MD	
8,777.09	8,269.84	289.96	-1,988.80	70° Inclination @ 8777.09' MD	
11,407.34	8,315.70	-2,335.50	-1,970.37	Cross @ 11407.34' MD	
16,676.85	8,341.15	-7,602.00	-2,021.11	Cross @ 16676.85' MD	
21,396.00	8,365.49	-12,317.88	-2,011.99	Last MWD Survey @ 21396' MD	
21,457.00	8,364.39	-12,378.85	-2,013.63	Projection to TD @ 21457' MD 499' FSL/ 1640' FWL	

Checked By: _____	Approved By: _____	Date: _____
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