

# **Extraction Oil & Gas**

**Weld County, CO (NAD83)**

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

**Livingston S19-25-15N**

**Wellbore #1**

**Design: Wellbore #1**

## **Standard Survey Report**

**20 November, 2019**

## Survey Report

<b>Company:</b>	Extraction Oil & Gas	<b>Local Co-ordinate Reference:</b>	Well Livingston S19-25-15N
<b>Project:</b>	Weld County, CO (NAD83)	<b>TVD Reference:</b>	KB @ 5356.30usft (Patterson 901)
<b>Site:</b>	Sec 07-T01S-R68W Livingston Pad	<b>MD Reference:</b>	KB @ 5356.30usft (Patterson 901)
<b>Well:</b>	Livingston S19-25-15N	<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 S19-25-15N				
Well Position	+N/-S	0.00 usft	Northing:	1,235,372.29 usft	Latitude:	39.978560
	+E/-W	0.00 usft	Easting:	3,129,128.33 usft	Longitude:	-105.039223
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	5,327.30 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	10/23/2019	8.07	66.42	51,832.26629854

<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	174.81	

<b>Survey Program</b>	<b>Date</b>	11/20/2019			
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
130.00	20,962.00	Atlas MWD EOW (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
130.00	0.40	359.67	130.00	0.45	0.00	-0.45	0.31	0.31	0.00
<b>First MWD Survey @ 130' MD</b>									
220.00	0.57	352.49	220.00	1.21	-0.06	-1.21	0.20	0.19	-7.98
312.00	0.80	0.07	311.99	2.31	-0.12	-2.31	0.27	0.25	8.24
406.00	0.71	353.85	405.98	3.54	-0.18	-3.55	0.13	-0.10	-6.62
502.00	0.88	340.46	501.97	4.83	-0.49	-4.85	0.26	0.18	-13.95
597.00	0.84	332.35	596.96	6.13	-1.06	-6.20	0.13	-0.04	-8.54
693.00	0.84	300.09	692.95	7.11	-2.00	-7.26	0.49	0.00	-33.60
789.00	1.46	210.06	788.94	6.40	-3.22	-6.67	1.75	0.65	-93.78
884.00	2.08	208.83	883.89	3.85	-4.66	-4.25	0.65	0.65	-1.29

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<b>Site:</b>	Sec 07-T01S-R68W Livingston Pad	<b>MD Reference:</b>	KB @ 5356.30usft (Patterson 901)
<b>Well:</b>	Livingston S19-25-15N	<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)
980.00	2.70	214.64	979.81	0.46	-6.78	-1.07	0.69	0.65	6.05
1,075.00	2.83	175.56	1,074.71	-3.72	-7.87	2.99	1.95	0.14	-41.14
1,170.00	3.18	174.90	1,169.57	-8.68	-7.46	7.97	0.37	0.37	-0.69
1,266.00	2.56	136.38	1,265.46	-12.89	-5.74	12.32	2.06	-0.65	-40.13
1,360.00	2.21	131.75	1,359.38	-15.61	-2.94	15.28	0.42	-0.37	-4.93
1,455.00	2.52	76.54	1,454.31	-16.35	0.46	16.32	2.32	0.33	-58.12
1,550.00	3.62	60.32	1,549.18	-14.38	5.10	14.78	1.46	1.16	-17.07
1,588.00	3.54	53.58	1,587.10	-13.09	7.08	13.67	1.13	-0.21	-17.74
1,663.00	4.82	55.22	1,661.90	-9.91	11.53	10.92	1.71	1.71	2.19
1,758.00	8.09	53.99	1,756.29	-3.71	20.22	5.52	3.44	3.44	-1.29
1,853.00	9.85	52.80	1,850.12	5.14	32.10	-2.22	1.86	1.85	-1.25
1,949.00	12.59	53.02	1,944.28	16.40	47.00	-12.08	2.85	2.85	0.23
2,044.00	15.86	54.25	2,036.35	30.21	65.81	-24.14	3.46	3.44	1.29
2,139.00	15.16	52.05	2,127.89	45.44	86.15	-37.46	0.96	-0.74	-2.32
2,234.00	16.08	58.84	2,219.39	59.89	107.20	-49.95	2.15	0.97	7.15
2,328.00	15.47	57.16	2,309.85	73.42	128.87	-61.47	0.81	-0.65	-1.79
2,422.00	14.85	56.06	2,400.58	86.95	149.40	-73.08	0.73	-0.66	-1.17
2,517.00	14.05	54.43	2,492.57	100.45	168.88	-84.77	0.94	-0.84	-1.72
2,612.00	15.78	59.81	2,584.37	113.66	189.43	-96.06	2.33	1.82	5.66
2,708.00	15.16	59.19	2,676.89	126.65	211.49	-107.01	0.67	-0.65	-0.65
2,802.00	14.23	58.26	2,767.82	139.02	231.88	-117.49	1.02	-0.99	-0.99
2,896.00	16.44	60.11	2,858.47	151.73	253.24	-128.22	2.41	2.35	1.97
2,992.00	16.04	60.38	2,950.64	165.06	276.54	-139.38	0.42	-0.42	0.28
3,087.00	13.96	59.01	3,042.39	177.44	297.78	-149.80	2.22	-2.19	-1.44
3,183.00	16.88	58.79	3,134.93	190.63	319.63	-160.95	3.04	3.04	-0.23
3,278.00	16.00	58.09	3,226.04	204.70	342.54	-172.89	0.95	-0.93	-0.74
3,373.00	14.10	57.34	3,317.78	217.87	363.40	-184.12	2.01	-2.00	-0.79
3,468.00	12.64	54.52	3,410.21	230.14	381.61	-194.70	1.68	-1.54	-2.97
3,563.00	16.53	55.27	3,502.13	243.88	401.19	-206.61	4.10	4.09	0.79
3,659.00	15.29	53.94	3,594.45	259.11	422.64	-219.84	1.35	-1.29	-1.39
3,754.00	13.30	51.34	3,686.50	273.32	441.30	-232.30	2.20	-2.09	-2.74
3,850.00	15.02	55.84	3,779.58	287.20	460.22	-244.42	2.13	1.79	4.69
3,945.00	13.61	57.91	3,871.63	300.05	479.88	-255.44	1.58	-1.48	2.18
4,040.00	16.35	61.39	3,963.40	312.39	501.09	-265.81	3.03	2.88	3.66
4,135.00	15.07	62.89	4,054.85	324.43	523.82	-275.74	1.41	-1.35	1.58
4,231.00	16.35	60.20	4,147.26	336.83	546.66	-286.03	1.53	1.33	-2.80
4,326.00	14.10	60.91	4,238.92	349.10	568.38	-296.29	2.38	-2.37	0.75
4,421.00	15.64	52.40	4,330.75	362.54	588.64	-307.84	2.81	1.62	-8.96
4,516.00	15.64	55.79	4,422.23	377.56	609.38	-320.92	0.96	0.00	3.57
4,612.00	17.15	56.46	4,514.33	392.65	631.88	-333.92	1.59	1.57	0.70
4,707.00	17.54	59.32	4,605.01	407.70	655.86	-346.73	0.99	0.41	3.01
4,802.00	15.42	59.94	4,696.10	421.33	679.11	-358.21	2.24	-2.23	0.65
4,898.00	17.50	52.01	4,788.17	436.61	701.54	-371.40	3.18	2.17	-8.26

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<b>Design:</b>	Wellbore #1	<b>Database:</b>	EDM 5000.15 Single User Db

Survey										
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4,993.00	17.37	51.30	4,878.81	454.27	723.86	-386.97	0.26	-0.14	-0.75	
5,089.00	15.25	51.78	4,970.94	471.04	744.96	-401.76	2.21	-2.21	0.50	
5,184.00	13.43	51.34	5,062.98	485.66	763.40	-414.66	1.92	-1.92	-0.46	
5,279.00	16.13	50.02	5,154.82	501.04	782.13	-428.28	2.86	2.84	-1.39	
5,374.00	17.50	53.33	5,245.76	518.05	803.70	-443.27	1.76	1.44	3.48	
5,470.00	14.94	53.55	5,337.93	534.02	825.23	-457.23	2.67	-2.67	0.23	
5,565.00	14.63	56.15	5,429.79	547.98	845.05	-469.34	0.77	-0.33	2.74	
5,661.00	16.22	55.49	5,522.33	562.33	866.16	-481.72	1.67	1.66	-0.69	
5,757.00	13.92	54.83	5,615.02	576.58	886.65	-494.06	2.40	-2.40	-0.69	
5,851.00	15.25	62.36	5,706.00	588.83	906.85	-504.43	2.46	1.41	8.01	
5,947.00	16.53	61.66	5,798.33	601.17	930.06	-514.62	1.35	1.33	-0.73	
6,043.00	14.58	58.88	5,890.81	613.90	952.42	-525.28	2.17	-2.03	-2.90	
6,138.00	16.97	53.24	5,982.23	628.38	973.77	-537.77	2.99	2.52	-5.94	
6,234.00	17.72	51.74	6,073.86	645.81	996.47	-553.08	0.91	0.78	-1.56	
6,329.00	16.35	51.30	6,164.69	663.12	1,018.26	-568.35	1.45	-1.44	-0.46	
6,424.00	16.57	58.44	6,255.81	678.58	1,040.24	-581.75	2.14	0.23	7.52	
6,519.00	15.07	58.31	6,347.21	692.15	1,062.29	-593.28	1.58	-1.58	-0.14	
6,614.00	13.08	56.19	6,439.35	704.63	1,081.73	-603.94	2.16	-2.09	-2.23	
6,710.00	11.49	67.78	6,533.16	714.29	1,099.61	-611.95	3.05	-1.66	12.07	
6,805.00	9.90	67.74	6,626.51	720.96	1,115.93	-617.12	1.67	-1.67	-0.04	
6,900.00	8.57	64.65	6,720.28	727.08	1,129.89	-621.96	1.49	-1.40	-3.25	
7,018.00	6.85	60.33	6,837.21	734.33	1,143.95	-627.90	1.54	-1.46	-3.66	
7,113.00	2.08	48.52	6,931.89	738.28	1,150.17	-631.28	5.09	-5.02	-12.43	
7,209.00	0.84	55.71	7,027.86	739.83	1,152.05	-632.65	1.30	-1.29	7.49	
7,304.00	0.84	30.63	7,122.85	740.82	1,152.98	-633.55	0.38	0.00	-26.40	
7,399.00	0.97	35.30	7,217.84	742.08	1,153.80	-634.73	0.16	0.14	4.92	
7,495.00	0.66	29.75	7,313.83	743.22	1,154.55	-635.80	0.33	-0.32	-5.78	
7,590.00	8.04	171.91	7,408.54	737.11	1,155.75	-629.60	9.02	7.77	149.64	
7,686.00	21.70	164.86	7,501.11	713.21	1,161.36	-605.30	14.33	14.23	-7.34	
7,751.38	29.99	168.11	7,559.90	685.51	1,167.90	-577.12	12.86	12.68	4.97	
30° Inclination @ 7751.38' MD										
7,781.00	33.76	169.09	7,585.05	670.18	1,170.98	-561.57	12.86	12.74	3.31	
7,876.00	38.75	176.14	7,661.67	614.54	1,177.99	-505.52	6.84	5.25	7.42	
7,972.00	45.91	177.73	7,732.59	550.03	1,181.38	-440.97	7.54	7.46	1.66	
8,067.00	49.36	177.82	7,796.60	479.90	1,184.10	-370.88	3.63	3.63	0.09	
8,162.00	57.36	180.20	7,853.25	403.75	1,185.34	-294.93	8.66	8.42	2.51	
8,258.00	65.84	177.99	7,898.88	319.40	1,186.73	-210.80	9.06	8.83	-2.30	
8,343.91	70.00	178.95	7,931.16	239.84	1,188.85	-131.37	4.95	4.84	1.12	
70° Inclination @ 8343.91' MD										
8,353.00	70.44	179.05	7,934.24	231.28	1,189.00	-122.84	4.95	4.85	1.08	
8,449.00	80.87	180.90	7,957.99	138.41	1,189.00	-30.35	11.02	10.86	1.93	
8,544.00	88.82	182.00	7,966.52	43.90	1,186.60	63.55	8.45	8.37	1.16	
8,640.00	89.00	181.96	7,968.35	-52.02	1,183.29	158.79	0.19	0.19	-0.04	
8,735.00	88.69	181.48	7,970.26	-146.96	1,180.44	253.08	0.60	-0.33	-0.51	

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8,831.00	88.47	180.86	7,972.64	-242.91	1,178.48	348.46	0.69	-0.23	-0.65
8,926.00	88.56	180.55	7,975.11	-337.87	1,177.31	442.92	0.34	0.09	-0.33
9,021.00	89.44	180.24	7,976.76	-432.85	1,176.65	537.46	0.98	0.93	-0.33
9,116.00	89.79	180.59	7,977.40	-527.85	1,175.97	632.00	0.52	0.37	0.37
9,212.00	89.66	183.24	7,977.86	-623.79	1,172.76	727.26	2.76	-0.14	2.76
9,307.00	89.66	183.24	7,978.43	-718.63	1,167.39	821.23	0.00	0.00	0.00
9,402.00	89.62	182.97	7,979.02	-813.49	1,162.24	915.23	0.29	-0.04	-0.28
9,497.00	89.84	183.06	7,979.47	-908.36	1,157.25	1,009.26	0.25	0.23	0.09
9,592.00	89.66	182.93	7,979.89	-1,003.23	1,152.28	1,103.29	0.23	-0.19	-0.14
9,687.00	89.48	182.80	7,980.60	-1,098.11	1,147.54	1,197.35	0.23	-0.19	-0.14
9,781.00	89.57	182.89	7,981.38	-1,191.99	1,142.87	1,290.43	0.14	0.10	0.10
9,877.00	89.84	183.02	7,981.87	-1,287.86	1,137.92	1,385.46	0.31	0.28	0.14
9,972.00	90.19	182.58	7,981.85	-1,382.74	1,133.28	1,479.54	0.59	0.37	-0.46
10,067.00	90.90	181.92	7,980.94	-1,477.66	1,129.55	1,573.73	1.02	0.75	-0.69
10,162.00	91.38	181.12	7,979.05	-1,572.61	1,127.03	1,668.06	0.98	0.51	-0.84
10,258.00	88.03	181.61	7,979.55	-1,668.57	1,124.74	1,763.42	3.53	-3.49	0.51
10,353.00	87.32	181.70	7,983.40	-1,763.45	1,122.00	1,857.67	0.75	-0.75	0.09
10,448.00	89.97	180.02	7,985.65	-1,858.40	1,120.58	1,952.10	3.30	2.79	-1.77
10,543.00	90.28	179.27	7,985.44	-1,953.40	1,121.17	2,046.76	0.85	0.33	-0.79
10,638.00	90.41	178.48	7,984.87	-2,048.38	1,123.03	2,141.52	0.84	0.14	-0.83
10,734.00	90.23	177.82	7,984.33	-2,144.33	1,126.13	2,237.35	0.71	-0.19	-0.69
10,828.00	90.68	176.54	7,983.59	-2,238.21	1,130.76	2,331.27	1.44	0.48	-1.36
10,916.98	90.68	176.22	7,982.53	-2,327.00	1,136.38	2,420.21	0.36	0.00	-0.36
Cross @ 10916.98' MD									
10,924.00	90.68	176.19	7,982.45	-2,334.01	1,136.84	2,427.23	0.36	0.00	-0.36
11,019.00	89.88	178.70	7,981.98	-2,428.90	1,141.08	2,522.12	2.77	-0.84	2.64
11,114.00	90.37	177.99	7,981.77	-2,523.86	1,143.82	2,616.94	0.91	0.52	-0.75
11,210.00	88.86	180.86	7,982.42	-2,619.84	1,144.78	2,712.61	3.38	-1.57	2.99
11,305.00	89.31	180.42	7,983.94	-2,714.82	1,143.72	2,807.11	0.66	0.47	-0.46
11,400.00	90.06	179.80	7,984.46	-2,809.82	1,143.54	2,901.70	1.02	0.79	-0.65
11,495.00	90.77	179.32	7,983.77	-2,904.81	1,144.27	2,996.37	0.90	0.75	-0.51
11,590.00	89.44	181.21	7,983.60	-2,999.81	1,143.83	3,090.93	2.43	-1.40	1.99
11,686.00	89.62	181.17	7,984.38	-3,095.78	1,141.84	3,186.34	0.19	0.19	-0.04
11,781.00	89.88	180.51	7,984.80	-3,190.77	1,140.44	3,280.81	0.75	0.27	-0.69
11,876.00	90.15	180.15	7,984.77	-3,285.77	1,139.90	3,375.37	0.47	0.28	-0.38
11,972.00	88.11	181.92	7,986.23	-3,381.73	1,138.16	3,470.78	2.81	-2.13	1.84
12,067.00	87.94	181.39	7,989.51	-3,476.64	1,135.42	3,565.05	0.59	-0.18	-0.56
12,163.00	88.33	181.03	7,992.63	-3,572.56	1,133.40	3,660.40	0.55	0.41	-0.38
12,258.00	88.91	180.86	7,994.92	-3,667.52	1,131.83	3,754.83	0.64	0.61	-0.18
12,354.00	89.48	180.29	7,996.27	-3,763.51	1,130.87	3,850.34	0.84	0.59	-0.59
12,449.00	90.19	179.71	7,996.54	-3,858.51	1,130.87	3,944.94	0.97	0.75	-0.61
12,545.00	89.44	180.81	7,996.85	-3,954.50	1,130.43	4,040.51	1.39	-0.78	1.15
12,640.00	89.75	180.42	7,997.52	-4,049.50	1,129.41	4,135.02	0.52	0.33	-0.41

## Survey Report

<b>Company:</b>	Extraction Oil & Gas	<b>Local Co-ordinate Reference:</b>	Well Livingston S19-25-15N
<b>Project:</b>	Weld County, CO (NAD83)	<b>TVD Reference:</b>	KB @ 5356.30usft (Patterson 901)
<b>Site:</b>	Sec 07-T01S-R68W Livingston Pad	<b>MD Reference:</b>	KB @ 5356.30usft (Patterson 901)
<b>Well:</b>	Livingston S19-25-15N	<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)
12,736.00	90.10	179.98	7,997.65	-4,145.49	1,129.08	4,230.59	0.59	0.36	-0.46
12,831.00	87.45	180.37	7,999.68	-4,240.46	1,128.79	4,325.15	2.82	-2.79	0.41
12,927.00	87.45	179.98	8,003.95	-4,336.37	1,128.49	4,420.63	0.41	0.00	-0.41
13,022.00	87.85	179.40	8,007.84	-4,431.29	1,129.01	4,515.21	0.74	0.42	-0.61
13,117.00	88.51	178.57	8,010.86	-4,526.22	1,130.69	4,609.91	1.12	0.69	-0.87
13,213.00	88.91	177.95	8,013.02	-4,622.15	1,133.60	4,705.71	0.77	0.42	-0.65
13,309.00	89.40	177.47	8,014.44	-4,718.07	1,137.44	4,801.58	0.71	0.51	-0.50
13,404.00	89.53	180.73	8,015.33	-4,813.04	1,138.93	4,896.29	3.43	0.14	3.43
13,500.00	90.54	180.64	8,015.27	-4,909.03	1,137.78	4,991.79	1.06	1.05	-0.09
13,595.00	89.93	181.65	8,014.88	-5,004.01	1,135.88	5,086.21	1.24	-0.64	1.06
13,690.00	87.89	182.93	8,016.69	-5,098.91	1,132.09	5,180.38	2.53	-2.15	1.35
13,786.00	88.33	182.89	8,019.85	-5,194.73	1,127.22	5,275.37	0.46	0.46	-0.04
13,881.00	88.82	182.71	8,022.21	-5,289.59	1,122.58	5,369.42	0.55	0.52	-0.19
13,976.00	89.31	182.97	8,023.76	-5,384.46	1,117.87	5,463.47	0.58	0.52	0.27
14,071.00	90.46	182.31	8,023.95	-5,479.35	1,113.50	5,557.58	1.40	1.21	-0.69
14,166.00	87.94	182.53	8,025.28	-5,574.25	1,109.49	5,651.73	2.66	-2.65	0.23
14,261.00	88.03	182.53	8,028.62	-5,669.10	1,105.30	5,745.81	0.09	0.09	0.00
14,356.00	88.64	182.49	8,031.38	-5,763.97	1,101.14	5,839.92	0.64	0.64	-0.04
14,451.00	88.95	182.31	8,033.38	-5,858.87	1,097.16	5,934.06	0.38	0.33	-0.19
14,546.00	88.64	181.74	8,035.38	-5,953.78	1,093.80	6,028.29	0.68	-0.33	-0.60
14,642.00	89.40	180.11	8,037.02	-6,049.75	1,092.25	6,123.73	1.87	0.79	-1.70
14,737.00	89.31	180.15	8,038.09	-6,144.75	1,092.04	6,218.31	0.10	-0.09	0.04
14,832.00	90.32	179.89	8,038.40	-6,239.75	1,092.01	6,312.92	1.10	1.06	-0.27
14,927.00	90.46	179.49	8,037.75	-6,334.74	1,092.52	6,407.57	0.45	0.15	-0.42
15,022.00	90.85	179.62	8,036.66	-6,429.73	1,093.26	6,502.24	0.43	0.41	0.14
15,117.00	90.37	179.05	8,035.65	-6,524.72	1,094.36	6,596.94	0.78	-0.51	-0.60
15,212.00	90.68	178.57	8,034.78	-6,619.70	1,096.33	6,691.70	0.60	0.33	-0.51
15,306.00	90.90	178.35	8,033.49	-6,713.65	1,098.86	6,785.50	0.33	0.23	-0.23
15,401.00	91.25	176.85	8,031.70	-6,808.55	1,102.84	6,880.37	1.62	0.37	-1.58
15,497.00	91.60	176.01	8,029.32	-6,904.33	1,108.81	6,976.30	0.95	0.36	-0.88
15,592.00	89.88	178.52	8,028.09	-6,999.21	1,113.34	7,071.20	3.20	-1.81	2.64
15,687.00	90.01	178.57	8,028.18	-7,094.18	1,115.76	7,166.00	0.15	0.14	0.05
15,782.00	90.99	177.86	8,027.35	-7,189.12	1,118.71	7,260.82	1.27	1.03	-0.75
15,878.00	89.66	179.45	8,026.81	-7,285.09	1,120.97	7,356.60	2.16	-1.39	1.66
15,973.00	90.10	178.70	8,027.00	-7,380.08	1,122.50	7,451.34	0.92	0.46	-0.79
16,068.00	88.82	180.68	8,027.90	-7,475.06	1,123.02	7,545.98	2.48	-1.35	2.08
16,163.00	89.62	179.62	8,029.19	-7,570.05	1,122.77	7,640.56	1.40	0.84	-1.12
16,187.95	89.76	179.54	8,029.33	-7,595.00	1,122.95	7,665.42	0.65	0.56	-0.32
Cross @ 16187.95' MD									
16,257.00	90.15	179.32	8,029.38	-7,664.05	1,123.64	7,734.25	0.65	0.56	-0.32
16,352.00	89.84	181.39	8,029.39	-7,759.04	1,123.05	7,828.80	2.20	-0.33	2.18
16,448.00	90.68	180.86	8,028.95	-7,855.02	1,121.16	7,924.21	1.03	0.88	-0.55
16,542.00	88.56	181.70	8,029.58	-7,948.99	1,119.06	8,017.61	2.43	-2.26	0.89
16,638.00	88.69	181.87	8,031.88	-8,044.91	1,116.07	8,112.87	0.22	0.14	0.18

## Survey Report

<b>Company:</b>	Extraction Oil & Gas	<b>Local Co-ordinate Reference:</b>	Well Livingston S19-25-15N
<b>Project:</b>	Weld County, CO (NAD83)	<b>TVD Reference:</b>	KB @ 5356.30usft (Patterson 901)
<b>Site:</b>	Sec 07-T01S-R68W Livingston Pad	<b>MD Reference:</b>	KB @ 5356.30usft (Patterson 901)
<b>Well:</b>	Livingston S19-25-15N	<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)
16,734.00	89.40	181.74	8,033.48	-8,140.85	1,113.05	8,208.14	0.75	0.74	-0.14
16,829.00	91.16	181.30	8,033.02	-8,235.81	1,110.53	8,302.49	1.91	1.85	-0.46
16,924.00	92.75	181.12	8,029.78	-8,330.74	1,108.53	8,396.84	1.68	1.67	-0.19
17,020.00	89.22	180.59	8,028.13	-8,426.69	1,107.09	8,492.28	3.72	-3.68	-0.55
17,115.00	87.36	180.64	8,030.96	-8,521.64	1,106.07	8,586.74	1.96	-1.96	0.05
17,210.00	88.47	180.15	8,034.42	-8,616.58	1,105.42	8,681.23	1.28	1.17	-0.52
17,304.00	88.95	180.24	8,036.53	-8,710.55	1,105.10	8,774.79	0.52	0.51	0.10
17,399.00	89.53	179.40	8,037.79	-8,805.54	1,105.40	8,869.42	1.07	0.61	-0.88
17,494.00	90.15	178.61	8,038.06	-8,900.53	1,107.05	8,964.16	1.06	0.65	-0.83
17,590.00	88.64	179.93	8,039.07	-8,996.51	1,108.27	9,059.86	2.09	-1.57	1.38
17,685.00	89.09	179.36	8,040.95	-9,091.49	1,108.86	9,154.50	0.76	0.47	-0.60
17,780.00	90.28	179.23	8,041.48	-9,186.48	1,110.03	9,249.21	1.26	1.25	-0.14
17,876.00	88.78	179.40	8,042.26	-9,282.46	1,111.18	9,344.91	1.57	-1.56	0.18
17,971.00	89.75	179.14	8,043.48	-9,377.45	1,112.39	9,439.61	1.06	1.02	-0.27
18,067.00	88.69	182.00	8,044.79	-9,473.42	1,111.43	9,535.11	3.18	-1.10	2.98
18,162.00	89.00	181.61	8,046.71	-9,568.35	1,108.44	9,629.38	0.52	0.33	-0.41
18,257.00	89.09	181.12	8,048.29	-9,663.31	1,106.18	9,723.75	0.52	0.09	-0.52
18,353.00	89.62	179.89	8,049.37	-9,759.30	1,105.33	9,819.27	1.40	0.55	-1.28
18,448.00	90.23	179.14	8,049.49	-9,854.30	1,106.14	9,913.95	1.02	0.64	-0.79
18,544.00	88.38	181.03	8,050.66	-9,950.28	1,105.99	10,009.52	2.75	-1.93	1.97
18,640.00	88.91	181.03	8,052.93	-10,046.24	1,104.27	10,104.93	0.55	0.55	0.00
18,735.00	89.48	180.59	8,054.26	-10,141.22	1,102.93	10,199.40	0.76	0.60	-0.46
18,831.00	90.37	180.11	8,054.39	-10,237.22	1,102.34	10,294.95	1.05	0.93	-0.50
18,926.00	89.22	180.11	8,054.73	-10,332.21	1,102.16	10,389.55	1.21	-1.21	0.00
19,022.00	88.11	180.33	8,056.97	-10,428.19	1,101.79	10,485.09	1.18	-1.16	0.23
19,117.00	88.25	180.29	8,059.98	-10,523.14	1,101.28	10,579.61	0.15	0.15	-0.04
19,213.00	88.60	180.24	8,062.62	-10,619.10	1,100.83	10,675.14	0.37	0.36	-0.05
19,308.00	89.26	180.37	8,064.39	-10,714.08	1,100.33	10,769.68	0.71	0.69	0.14
19,404.00	89.93	179.40	8,065.07	-10,810.08	1,100.52	10,865.30	1.23	0.70	-1.01
19,499.00	87.54	180.68	8,067.17	-10,905.04	1,100.45	10,959.88	2.85	-2.52	1.35
19,594.00	87.63	180.68	8,071.17	-10,999.95	1,099.33	11,054.29	0.09	0.09	0.00
19,688.00	88.16	180.64	8,074.63	-11,093.88	1,098.24	11,147.74	0.57	0.56	-0.04
19,782.00	88.95	180.59	8,077.00	-11,187.85	1,097.24	11,241.23	0.84	0.84	-0.05
19,877.00	89.93	179.80	8,077.93	-11,282.84	1,096.91	11,335.80	1.32	1.03	-0.83
19,971.00	90.15	179.45	8,077.86	-11,376.84	1,097.53	11,429.47	0.44	0.23	-0.37
20,066.00	90.06	179.71	8,077.69	-11,471.84	1,098.22	11,524.14	0.29	-0.09	0.27
20,161.00	90.94	179.01	8,076.86	-11,566.82	1,099.28	11,618.84	1.18	0.93	-0.74
20,256.00	91.30	178.04	8,075.00	-11,661.77	1,101.73	11,713.62	1.09	0.38	-1.02
20,351.00	91.16	178.83	8,072.96	-11,756.72	1,104.32	11,808.41	0.84	-0.15	0.83
20,446.00	90.90	179.80	8,071.25	-11,851.69	1,105.46	11,903.10	1.06	-0.27	1.02
20,540.00	89.04	179.23	8,071.30	-11,945.68	1,106.25	11,996.78	2.07	-1.98	-0.61
20,635.00	89.40	178.65	8,072.60	-12,040.66	1,108.01	12,091.52	0.72	0.38	-0.61
20,730.00	89.62	177.73	8,073.41	-12,135.61	1,111.01	12,186.35	1.00	0.23	-0.97

## Survey Report

<b>Company:</b>	Extraction Oil & Gas	<b>Local Co-ordinate Reference:</b>	Well Livingston S19-25-15N
<b>Project:</b>	Weld County, CO (NAD83)	<b>TVD Reference:</b>	KB @ 5356.30usft (Patterson 901)
<b>Site:</b>	Sec 07-T01S-R68W Livingston Pad	<b>MD Reference:</b>	KB @ 5356.30usft (Patterson 901)
<b>Well:</b>	Livingston S19-25-15N	<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)
20,824.00	89.84	177.47	8,073.85	-12,229.52	1,114.95	12,280.24	0.36	0.23	-0.28
20,897.00	90.06	176.54	8,073.91	-12,302.42	1,118.76	12,353.19	1.31	0.30	-1.27
Last MWD Survey @ 20897' MD									
20,962.00	90.06	176.54	8,073.85	-12,367.30	1,122.69	12,418.16	0.00	0.00	0.00
Projection to TD @ 20962' MD 511' FSL/ 90' FEL									

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 @ 7751.3 - actual wellpath misses target center by 0.10usft at 7751.38usft MD (7559.90 TVD, 685.51 N, 1167.90 E) - Point	0.00	0.00	7,559.90	685.52	1,167.99	1,236,063.87	3,130,292.75	39.980442	-105.035055
70° Inclination @ 8343.9 - actual wellpath hits target center - Point	0.00	0.00	7,931.16	239.83	1,188.85	1,235,618.30	3,130,315.92	39.979218	-105.034981
Cross @ 10916.98' MD - actual wellpath hits target center - Point	0.00	0.00	7,982.53	-2,327.00	1,136.38	1,233,051.23	3,130,276.79	39.972172	-105.035169
Cross @ 16187.95' MD - actual wellpath hits target center - Point	0.00	0.00	8,029.33	-7,595.00	1,122.95	1,227,783.23	3,130,290.73	39.957710	-105.035217

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
130.00	130.00	0.45	0.00	First MWD Survey @ 130' MD
7,751.38	7,559.90	685.51	1,167.90	30° Inclination @ 7751.38' MD
8,343.91	7,931.16	239.84	1,188.85	70° Inclination @ 8343.91' MD
10,916.98	7,982.53	-2,327.00	1,136.38	Cross @ 10916.98' MD
16,187.95	8,029.33	-7,595.00	1,122.95	Cross @ 16187.95' MD
20,897.00	8,073.91	-12,302.42	1,118.76	Last MWD Survey @ 20897' MD
20,962.00	8,073.85	-12,367.30	1,122.69	Projection to TD @ 20962' MD 511' FSL/ 90' FEL

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