

# **Extraction Oil & Gas**

**Weld County, CO (NAD83)**

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

**Livingston S20-25-3N**

**Wellbore #1**

**Design: Wellbore #1**

## **Standard Survey Report**

**12 November, 2019**

## Survey Report

<b>Company:</b>	Extraction Oil & Gas	<b>Local Co-ordinate Reference:</b>	Well Livingston S20-25-3N
<b>Project:</b>	Weld County, CO (NAD83)	<b>TVD Reference:</b>	KB @ 5358.20usft (Patterson 901)
<b>Site:</b>	Sec 07-T01S-R68W Livingston Pad	<b>MD Reference:</b>	KB @ 5358.20usft (Patterson 901)
<b>Well:</b>	Livingston S20-25-3N	<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 S20-25-3N				
Well Position	+N/-S	0.00 usft	Northing:	1,235,372.48 usft	Latitude:	39.978560
	+E/-W	0.00 usft	Easting:	3,129,164.48 usft	Longitude:	-105.039094
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	5,329.20 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	9/27/2019	8.07	66.42	51,840.33577184

<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	169.01	

<b>Survey Program</b>	<b>Date</b>	11/12/2019			
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
143.00	1,592.00	Surface Surveys (Wellbore #1)	MWD	MWD - Standard	
1,663.00	21,485.00	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	0.92	58.65	142.99	0.60	0.98	-0.40	0.64	0.64	0.00	
230.00	0.97	18.92	229.98	1.66	1.82	-1.28	0.74	0.06	-45.67	
318.00	1.45	8.02	317.96	3.46	2.21	-2.98	0.60	0.55	-12.39	
405.00	2.15	10.40	404.92	6.16	2.66	-5.54	0.81	0.80	2.74	
492.00	3.08	27.89	491.83	9.83	4.05	-8.88	1.40	1.07	20.10	
579.00	5.58	31.75	578.57	15.49	7.37	-13.80	2.89	2.87	4.44	
667.00	7.73	30.43	665.98	24.24	12.62	-21.39	2.45	2.44	-1.50	
754.00	9.01	32.90	752.05	35.00	19.28	-30.68	1.53	1.47	2.84	
841.00	10.94	32.63	837.73	47.68	27.43	-41.57	2.22	2.22	-0.31	

## Survey Report

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<b>Project:</b>	Weld County, CO (NAD83)	<b>TVD Reference:</b>	KB @ 5358.20usft (Patterson 901)
<b>Site:</b>	Sec 07-T01S-R68W Livingston Pad	<b>MD Reference:</b>	KB @ 5358.20usft (Patterson 901)
<b>Well:</b>	Livingston S20-25-3N	<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)
929.00	12.74	35.44	923.85	62.61	37.56	-54.30	2.15	2.05	3.19
1,016.00	14.59	36.50	1,008.39	79.24	49.65	-68.32	2.15	2.13	1.22
1,103.00	15.86	33.86	1,092.33	97.92	62.79	-84.15	1.66	1.46	-3.03
1,190.00	17.01	34.57	1,175.78	118.27	76.63	-101.49	1.34	1.32	0.82
1,278.00	19.03	31.40	1,259.46	141.12	91.41	-121.10	2.55	2.30	-3.60
1,365.00	20.04	30.96	1,341.45	166.01	106.47	-142.66	1.17	1.16	-0.51
1,452.00	21.97	32.10	1,422.67	192.58	122.79	-165.63	2.27	2.22	1.31
1,539.00	25.05	32.37	1,502.43	221.93	141.30	-190.92	3.54	3.54	0.31
1,592.00	25.93	32.28	1,550.27	241.20	153.50	-207.51	1.66	1.66	-0.17
Tie into Surface Surveys									
1,663.00	26.56	31.03	1,613.96	267.93	169.97	-230.61	1.18	0.89	-1.76
First MWD Survey @ 1663' MD									
1,758.00	29.56	30.15	1,697.78	306.40	192.70	-264.04	3.19	3.16	-0.93
1,853.00	32.30	27.24	1,779.27	349.24	216.09	-301.63	3.29	2.88	-3.06
1,949.00	34.16	26.40	1,859.57	396.19	239.81	-343.20	2.00	1.94	-0.88
2,061.00	35.79	28.47	1,951.34	453.15	269.41	-393.47	1.80	1.46	1.85
2,156.00	36.46	30.41	2,028.08	501.92	296.94	-436.09	1.40	0.71	2.04
2,251.00	35.00	27.33	2,105.20	550.47	323.74	-478.64	2.44	-1.54	-3.24
2,345.00	33.36	29.40	2,182.96	596.94	348.81	-519.48	2.14	-1.74	2.20
2,439.00	33.32	37.15	2,261.53	640.06	377.10	-556.41	4.53	-0.04	8.24
2,534.00	31.37	34.47	2,341.79	681.25	406.86	-591.17	2.55	-2.05	-2.82
2,629.00	31.29	37.51	2,422.94	721.20	435.88	-624.86	1.67	-0.08	3.20
2,725.00	33.10	35.04	2,504.18	762.45	466.11	-659.58	2.33	1.89	-2.57
2,819.00	34.38	35.35	2,582.35	805.11	496.20	-695.72	1.37	1.36	0.33
2,913.00	36.68	31.60	2,658.85	850.68	526.28	-734.72	3.37	2.45	-3.99
3,009.00	35.66	29.31	2,736.35	899.51	555.00	-777.18	1.76	-1.06	-2.39
3,104.00	33.23	27.33	2,814.69	946.79	580.51	-818.72	2.82	-2.56	-2.08
3,199.00	34.16	30.81	2,893.74	992.82	606.13	-859.03	2.26	0.98	3.66
3,294.00	32.57	30.90	2,973.08	1,037.67	632.92	-897.95	1.67	-1.67	0.09
3,390.00	33.94	29.75	3,053.35	1,083.12	659.49	-937.49	1.57	1.43	-1.20
3,485.00	36.81	27.28	3,130.81	1,131.45	685.70	-979.94	3.37	3.02	-2.60
3,580.00	35.31	26.18	3,207.61	1,181.39	710.86	-1,024.16	1.72	-1.58	-1.16
3,676.00	32.52	24.15	3,287.27	1,229.84	733.67	-1,067.38	3.14	-2.91	-2.11
3,771.00	33.01	28.52	3,367.17	1,275.89	756.47	-1,108.23	2.54	0.52	4.60
3,867.00	33.19	33.01	3,447.60	1,320.90	783.28	-1,147.31	2.56	0.19	4.68
3,962.00	33.32	34.77	3,527.04	1,364.14	812.32	-1,184.22	1.03	0.14	1.85
4,057.00	35.57	31.60	3,605.39	1,409.12	841.69	-1,222.77	3.03	2.37	-3.34
4,152.00	33.98	30.10	3,683.42	1,455.63	869.48	-1,263.13	1.90	-1.67	-1.58
4,247.00	34.42	30.76	3,761.99	1,501.67	896.53	-1,303.17	0.61	0.46	0.69
4,343.00	36.06	31.34	3,840.40	1,549.12	925.10	-1,344.30	1.74	1.71	0.60
4,438.00	33.27	29.40	3,918.53	1,595.71	952.44	-1,384.82	3.16	-2.94	-2.04
4,533.00	34.25	29.84	3,997.51	1,641.60	978.54	-1,424.90	1.06	1.03	0.46
4,629.00	36.54	32.04	4,075.76	1,689.27	1,007.14	-1,466.23	2.73	2.39	2.29

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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										
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)	
4,724.00	33.32	31.95	4,153.64	1,735.39	1,035.96	-1,506.02	3.39	-3.39	-0.09	
4,819.00	30.58	33.50	4,234.24	1,777.69	1,063.11	-1,542.36	3.01	-2.88	1.63	
4,915.00	31.11	33.23	4,316.66	1,818.80	1,090.18	-1,577.56	0.57	0.55	-0.28	
5,010.00	32.48	31.29	4,397.41	1,861.13	1,116.88	-1,614.02	1.80	1.44	-2.04	
5,106.00	33.01	25.74	4,478.17	1,906.72	1,141.63	-1,654.06	3.17	0.55	-5.78	
5,201.00	35.26	28.78	4,556.80	1,954.08	1,166.08	-1,695.88	2.97	2.37	3.20	
5,296.00	36.37	27.68	4,633.84	2,003.06	1,192.36	-1,738.95	1.35	1.17	-1.16	
5,391.00	38.40	28.16	4,709.32	2,054.02	1,219.38	-1,783.82	2.16	2.14	0.51	
5,487.00	35.79	28.12	4,785.89	2,105.07	1,246.68	-1,828.73	2.72	-2.72	-0.04	
5,582.00	35.53	29.35	4,863.08	2,153.63	1,273.31	-1,871.33	0.80	-0.27	1.29	
5,678.00	32.66	29.49	4,942.57	2,200.50	1,299.73	-1,912.30	2.99	-2.99	0.15	
5,773.00	32.92	29.40	5,022.43	2,245.31	1,325.03	-1,951.46	0.28	0.27	-0.09	
5,868.00	35.26	32.57	5,101.10	2,290.91	1,352.47	-1,991.00	3.09	2.46	3.34	
5,964.00	39.15	33.98	5,177.55	2,339.42	1,384.33	-2,032.53	4.15	4.05	1.47	
6,060.00	39.51	32.92	5,251.81	2,390.18	1,417.87	-2,075.97	0.79	0.38	-1.10	
6,155.00	37.91	30.32	5,325.94	2,440.75	1,449.03	-2,119.67	2.40	-1.68	-2.74	
6,251.00	37.12	30.24	5,402.09	2,491.23	1,478.51	-2,163.61	0.82	-0.82	-0.08	
6,346.00	36.50	28.39	5,478.15	2,540.86	1,506.38	-2,207.00	1.34	-0.65	-1.95	
6,441.00	34.87	27.06	5,555.31	2,589.90	1,532.17	-2,250.23	1.90	-1.72	-1.40	
6,536.00	34.29	29.49	5,633.53	2,637.38	1,557.70	-2,291.97	1.57	-0.61	2.56	
6,631.00	35.88	30.81	5,711.27	2,684.59	1,585.13	-2,333.08	1.85	1.67	1.39	
6,727.00	34.16	30.19	5,789.89	2,732.05	1,613.10	-2,374.34	1.83	-1.79	-0.65	
6,822.00	31.33	29.31	5,869.78	2,776.65	1,638.61	-2,413.26	3.02	-2.98	-0.93	
6,917.00	27.88	27.99	5,952.37	2,817.81	1,661.13	-2,449.37	3.70	-3.63	-1.39	
7,012.00	26.43	29.53	6,036.90	2,855.83	1,681.97	-2,482.71	1.70	-1.53	1.62	
7,107.00	25.23	28.43	6,122.40	2,892.03	1,702.04	-2,514.43	1.36	-1.26	-1.16	
7,203.00	22.36	26.97	6,210.23	2,926.30	1,720.06	-2,544.63	3.05	-2.99	-1.52	
7,298.00	22.01	32.17	6,298.21	2,957.48	1,737.74	-2,571.87	2.10	-0.37	5.47	
7,393.00	19.44	30.94	6,387.05	2,986.11	1,755.35	-2,596.62	2.74	-2.71	-1.29	
7,489.00	16.44	27.86	6,478.38	3,011.83	1,769.91	-2,619.09	3.28	-3.13	-3.21	
7,584.00	14.23	36.76	6,570.00	3,033.08	1,783.18	-2,637.41	3.39	-2.33	9.37	
7,680.00	10.56	36.18	6,663.75	3,049.63	1,795.44	-2,651.33	3.83	-3.82	-0.60	
7,775.00	8.84	35.13	6,757.39	3,062.63	1,804.78	-2,662.31	1.82	-1.81	-1.11	
7,871.00	6.36	22.04	6,852.54	3,073.60	1,811.02	-2,671.88	3.13	-2.58	-13.64	
7,966.00	3.31	26.36	6,947.20	3,080.93	1,814.22	-2,678.47	3.23	-3.21	4.55	
8,061.00	0.84	111.45	7,042.14	3,083.14	1,816.08	-2,680.28	3.52	-2.60	89.57	
8,157.00	0.53	154.42	7,138.13	3,082.48	1,816.93	-2,679.47	0.60	-0.32	44.76	
8,252.00	0.49	139.79	7,233.13	3,081.77	1,817.38	-2,678.69	0.14	-0.04	-15.40	
8,347.00	5.26	175.35	7,327.98	3,077.12	1,818.00	-2,674.01	5.13	5.02	37.43	
8,443.00	15.25	185.75	7,422.34	3,060.13	1,817.09	-2,657.50	10.54	10.41	10.83	
8,538.00	24.08	183.59	7,511.71	3,028.29	1,814.62	-2,626.72	9.32	9.29	-2.27	
8,634.00	28.94	180.81	7,597.59	2,985.49	1,813.06	-2,585.00	5.22	5.06	-2.90	
8,644.79	29.98	181.71	7,606.99	2,980.19	1,812.94	-2,579.82	10.49	9.65	8.36	
30° Inclination @ 8644.79' MD										

## Survey Report

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<b>Project:</b>	Weld County, CO (NAD83)	<b>TVD Reference:</b>	KB @ 5358.20usft (Patterson 901)
<b>Site:</b>	Sec 07-T01S-R68W Livingston Pad	<b>MD Reference:</b>	KB @ 5358.20usft (Patterson 901)
<b>Well:</b>	Livingston S20-25-3N	<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)
8,729.00	38.27	187.20	7,676.65	2,933.19	1,809.04	-2,534.43	10.49	9.84	6.52
8,825.00	44.68	182.58	7,748.56	2,869.90	1,803.79	-2,473.30	7.40	6.68	-4.81
8,920.00	50.77	179.62	7,812.44	2,799.66	1,802.53	-2,404.59	6.81	6.41	-3.12
9,015.00	65.49	178.57	7,862.47	2,719.22	1,803.86	-2,325.37	15.52	15.49	-1.11
9,073.77	70.00	178.85	7,884.72	2,664.85	1,805.08	-2,271.77	7.69	7.67	0.47
70° Inclination @ 9073.77' MD									
9,110.00	72.78	179.01	7,896.28	2,630.53	1,805.72	-2,237.95	7.69	7.67	0.45
9,206.00	73.13	178.70	7,924.42	2,538.76	1,807.56	-2,147.52	0.48	0.36	-0.32
9,301.00	78.61	178.08	7,947.60	2,446.71	1,810.15	-2,056.66	5.80	5.77	-0.65
9,396.00	87.05	177.33	7,959.45	2,352.61	1,813.93	-1,963.57	8.92	8.88	-0.79
9,491.00	88.38	177.02	7,963.24	2,257.81	1,818.60	-1,869.61	1.44	1.40	-0.33
9,586.00	89.04	176.54	7,965.37	2,162.98	1,823.94	-1,775.51	0.86	0.69	-0.51
9,681.00	90.37	178.39	7,965.86	2,068.08	1,828.14	-1,681.55	2.40	1.40	1.95
9,775.00	89.84	181.39	7,965.69	1,974.09	1,828.32	-1,589.25	3.24	-0.56	3.19
9,871.00	90.63	181.08	7,965.30	1,878.12	1,826.25	-1,495.43	0.88	0.82	-0.32
9,966.00	92.14	180.55	7,963.00	1,783.16	1,824.90	-1,402.47	1.68	1.59	-0.56
10,061.00	89.93	179.80	7,961.29	1,688.18	1,824.61	-1,309.29	2.46	-2.33	-0.79
10,156.00	90.85	179.89	7,960.64	1,593.18	1,824.87	-1,215.99	0.97	0.97	0.09
10,252.00	88.33	180.02	7,961.33	1,497.19	1,824.94	-1,121.75	2.63	-2.63	0.14
10,347.00	88.25	180.20	7,964.16	1,402.24	1,824.76	-1,028.57	0.21	-0.08	0.19
10,442.00	89.04	180.29	7,966.41	1,307.26	1,824.35	-935.41	0.84	0.83	0.09
10,537.00	89.84	179.84	7,967.34	1,212.27	1,824.25	-842.18	0.97	0.84	-0.47
10,632.00	90.81	178.88	7,966.80	1,117.28	1,825.31	-748.73	1.44	1.02	-1.01
10,728.00	91.83	177.77	7,964.59	1,021.35	1,828.11	-654.03	1.57	1.06	-1.16
10,822.00	92.14	180.11	7,961.33	927.43	1,829.85	-561.50	2.51	0.33	2.49
10,918.00	91.07	180.11	7,958.64	831.47	1,829.67	-467.33	1.11	-1.11	0.00
11,013.00	92.14	179.67	7,955.98	736.51	1,829.85	-374.08	1.22	1.13	-0.46
11,108.00	89.04	179.67	7,955.00	641.53	1,830.40	-280.74	3.26	-3.26	0.00
11,204.00	90.01	179.18	7,955.80	545.53	1,831.36	-186.32	1.13	1.01	-0.51
11,299.00	91.16	178.43	7,954.83	450.56	1,833.34	-92.72	1.45	1.21	-0.79
11,394.00	89.04	180.55	7,954.66	355.58	1,834.19	0.69	3.16	-2.23	2.23
11,489.00	89.48	180.46	7,955.89	260.59	1,833.35	93.77	0.47	0.46	-0.09
11,584.00	91.21	179.71	7,955.32	165.60	1,833.21	187.00	1.98	1.82	-0.79
11,680.00	89.26	181.25	7,954.92	69.61	1,832.40	281.07	2.59	-2.03	1.60
11,775.00	90.23	180.68	7,955.35	-25.38	1,830.80	374.01	1.18	1.02	-0.60
11,870.00	87.58	180.95	7,957.16	-120.34	1,829.45	466.97	2.80	-2.79	0.28
11,966.00	88.51	180.59	7,960.44	-216.28	1,828.16	560.90	1.04	0.97	-0.38
12,061.00	89.53	180.33	7,962.06	-311.26	1,827.40	653.99	1.11	1.07	-0.27
12,182.00	90.15	180.20	7,962.40	-432.26	1,826.84	772.66	0.52	0.51	-0.11
12,278.00	90.10	182.53	7,962.19	-528.22	1,824.55	866.43	2.43	-0.05	2.43
12,373.00	90.28	183.19	7,961.87	-623.10	1,819.81	958.67	0.72	0.19	0.69
12,469.00	90.46	182.75	7,961.25	-718.97	1,814.84	1,051.83	0.50	0.19	-0.46
12,554.00	88.47	181.74	7,962.05	-803.90	1,811.51	1,134.56	2.63	-2.34	-1.19

# Survey Report

<b>Company:</b>	Extraction Oil & Gas	<b>Local Co-ordinate Reference:</b>	Well Livingston S20-25-3N
<b>Project:</b>	Weld County, CO (NAD83)	<b>TVD Reference:</b>	KB @ 5358.20usft (Patterson 901)
<b>Site:</b>	Sec 07-T01S-R68W Livingston Pad	<b>MD Reference:</b>	KB @ 5358.20usft (Patterson 901)
<b>Well:</b>	Livingston S20-25-3N	<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)	
12,650.00	88.33	181.61	7,964.73	-899.82	1,808.71	1,228.19	0.20	-0.15	-0.14	
12,745.00	88.25	181.25	7,967.56	-994.75	1,806.34	1,320.92	0.39	-0.08	-0.38	
12,840.00	88.03	181.25	7,970.65	-1,089.67	1,804.27	1,413.71	0.23	-0.23	0.00	
12,935.00	88.82	179.84	7,973.26	-1,184.63	1,803.36	1,506.76	1.70	0.83	-1.48	
13,031.00	89.04	179.49	7,975.05	-1,280.61	1,803.92	1,601.08	0.43	0.23	-0.36	
13,127.00	89.44	179.14	7,976.32	-1,376.60	1,805.07	1,695.53	0.55	0.42	-0.36	
13,222.00	89.26	178.83	7,977.40	-1,471.57	1,806.75	1,789.08	0.38	-0.19	-0.33	
13,318.00	89.40	178.26	7,978.52	-1,567.54	1,809.19	1,883.75	0.61	0.15	-0.59	
13,413.00	90.94	178.96	7,978.24	-1,662.50	1,811.50	1,977.41	1.78	1.62	0.74	
13,508.00	89.57	179.54	7,977.82	-1,757.49	1,812.74	2,070.90	1.57	-1.44	0.61	
13,604.00	89.79	179.18	7,978.36	-1,853.49	1,813.81	2,165.33	0.44	0.23	-0.38	
13,699.00	90.77	178.79	7,977.89	-1,948.47	1,815.49	2,258.89	1.11	1.03	-0.41	
13,794.00	89.17	179.49	7,977.94	-2,043.45	1,816.92	2,352.41	1.84	-1.68	0.74	
13,889.00	88.86	179.36	7,979.57	-2,138.43	1,817.87	2,445.83	0.35	-0.33	-0.14	
13,984.00	90.54	180.33	7,980.07	-2,233.43	1,818.13	2,539.13	2.04	1.77	1.02	
14,076.58	90.33	180.42	7,979.37	-2,326.00	1,817.53	2,629.89	0.25	-0.23	0.09	
Cross @ 14076.58' MD										
14,079.00	90.32	180.42	7,979.36	-2,328.42	1,817.51	2,632.26	0.25	-0.23	0.09	
14,174.00	90.06	180.64	7,979.04	-2,423.42	1,816.63	2,725.35	0.36	-0.27	0.23	
14,269.00	90.32	180.37	7,978.73	-2,518.41	1,815.79	2,818.44	0.39	0.27	-0.28	
14,364.00	88.73	180.55	7,979.52	-2,613.40	1,815.03	2,911.54	1.68	-1.67	0.19	
14,460.00	88.78	181.25	7,981.60	-2,709.37	1,813.52	3,005.46	0.73	0.05	0.73	
14,555.00	88.86	181.65	7,983.56	-2,804.32	1,811.12	3,098.21	0.43	0.08	0.42	
14,650.00	89.62	179.58	7,984.82	-2,899.30	1,810.10	3,191.25	2.32	0.80	-2.18	
14,745.00	89.66	179.71	7,985.42	-2,994.30	1,810.69	3,284.62	0.14	0.04	0.14	
14,840.00	89.79	179.45	7,985.87	-3,089.29	1,811.38	3,378.00	0.31	0.14	-0.27	
14,935.00	90.94	179.01	7,985.27	-3,184.28	1,812.66	3,471.49	1.30	1.21	-0.46	
15,030.00	87.80	179.54	7,986.31	-3,279.25	1,813.86	3,564.95	3.35	-3.31	0.56	
15,125.00	87.19	178.83	7,990.46	-3,374.15	1,815.21	3,658.37	0.98	-0.64	-0.75	
15,219.00	86.48	178.65	7,995.65	-3,467.99	1,817.28	3,750.87	0.78	-0.76	-0.19	
15,315.00	87.98	176.67	8,000.29	-3,563.79	1,821.19	3,845.66	2.59	1.56	-2.06	
15,410.00	88.20	176.14	8,003.46	-3,658.55	1,827.15	3,939.82	0.60	0.23	-0.56	
15,505.00	88.38	177.95	8,006.29	-3,753.37	1,832.04	4,033.84	1.91	0.19	1.91	
15,601.00	88.91	177.33	8,008.56	-3,849.26	1,835.99	4,128.72	0.85	0.55	-0.65	
15,696.00	88.64	177.07	8,010.59	-3,944.13	1,840.63	4,222.73	0.39	-0.28	-0.27	
15,791.00	89.88	179.58	8,011.82	-4,039.07	1,843.41	4,316.46	2.95	1.31	2.64	
15,886.00	89.75	179.36	8,012.13	-4,134.07	1,844.29	4,409.88	0.27	-0.14	-0.23	
15,981.00	87.94	180.24	8,014.04	-4,229.04	1,844.62	4,503.18	2.12	-1.91	0.93	
16,075.00	87.85	180.29	8,017.50	-4,322.98	1,844.18	4,595.31	0.11	-0.10	0.05	
16,170.00	87.63	180.07	8,021.24	-4,417.90	1,843.89	4,688.44	0.33	-0.23	-0.23	
16,266.00	88.03	178.74	8,024.88	-4,513.83	1,844.88	4,782.79	1.45	0.42	-1.39	
16,361.00	87.98	178.21	8,028.18	-4,608.74	1,847.41	4,876.44	0.56	-0.05	-0.56	
16,456.00	89.13	180.15	8,030.58	-4,703.69	1,848.77	4,969.91	2.37	1.21	2.04	
16,552.00	89.48	179.71	8,031.74	-4,799.68	1,848.89	5,064.16	0.59	0.36	-0.46	

# Survey Report

<b>Company:</b>	Extraction Oil & Gas	<b>Local Co-ordinate Reference:</b>	Well Livingston S20-25-3N
<b>Project:</b>	Weld County, CO (NAD83)	<b>TVD Reference:</b>	KB @ 5358.20usft (Patterson 901)
<b>Site:</b>	Sec 07-T01S-R68W Livingston Pad	<b>MD Reference:</b>	KB @ 5358.20usft (Patterson 901)
<b>Well:</b>	Livingston S20-25-3N	<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)
16,647.00	89.09	179.05	8,032.93	-4,894.67	1,849.91	5,157.60	0.81	-0.41	-0.69
16,742.00	89.66	178.70	8,033.97	-4,989.64	1,851.78	5,251.19	0.70	0.60	-0.37
16,838.00	89.84	178.61	8,034.39	-5,085.62	1,854.03	5,345.83	0.21	0.19	-0.09
16,933.00	89.79	178.65	8,034.69	-5,180.59	1,856.30	5,439.49	0.07	-0.05	0.04
17,028.00	89.75	177.91	8,035.07	-5,275.54	1,859.15	5,533.25	0.78	-0.04	-0.78
17,122.00	89.70	176.80	8,035.52	-5,369.44	1,863.49	5,626.25	1.18	-0.05	-1.18
17,217.00	89.00	178.70	8,036.60	-5,464.36	1,867.22	5,720.14	2.13	-0.74	2.00
17,312.00	90.59	180.77	8,036.94	-5,559.35	1,867.66	5,813.47	2.75	1.67	2.18
17,408.00	89.44	180.15	8,036.92	-5,655.34	1,866.89	5,907.56	1.36	-1.20	-0.65
17,503.00	89.93	179.98	8,037.44	-5,750.34	1,866.78	6,000.79	0.55	0.52	-0.18
17,598.00	90.15	179.93	8,037.37	-5,845.34	1,866.86	6,094.06	0.24	0.23	-0.05
17,694.00	90.41	180.29	8,036.90	-5,941.34	1,866.67	6,188.26	0.46	0.27	0.38
17,789.00	90.94	180.07	8,035.79	-6,036.33	1,866.37	6,281.46	0.60	0.56	-0.23
17,885.00	88.91	180.86	8,035.91	-6,132.32	1,865.60	6,375.54	2.27	-2.11	0.82
17,980.00	89.09	180.81	8,037.57	-6,227.30	1,864.21	6,468.51	0.20	0.19	-0.05
18,075.00	89.40	180.73	8,038.82	-6,322.28	1,862.93	6,561.50	0.34	0.33	-0.08
18,171.00	89.44	180.51	8,039.79	-6,418.27	1,861.90	6,655.53	0.23	0.04	-0.23
18,267.00	89.35	180.24	8,040.81	-6,514.26	1,861.27	6,749.65	0.30	-0.09	-0.28
18,362.00	89.40	179.36	8,041.84	-6,609.26	1,861.60	6,842.96	0.93	0.05	-0.93
18,458.00	89.97	179.01	8,042.37	-6,705.24	1,862.96	6,937.45	0.70	0.59	-0.36
18,553.00	90.37	178.70	8,042.09	-6,800.22	1,864.86	7,031.05	0.53	0.42	-0.33
18,649.00	90.94	178.21	8,040.99	-6,896.18	1,867.45	7,125.74	0.78	0.59	-0.51
18,744.00	90.63	180.20	8,039.69	-6,991.16	1,868.77	7,219.22	2.12	-0.33	2.09
18,840.00	88.69	180.42	8,040.26	-7,087.15	1,868.25	7,313.35	2.03	-2.02	0.23
18,935.00	89.04	180.55	8,042.14	-7,182.13	1,867.45	7,406.44	0.39	0.37	0.14
19,031.00	89.62	180.46	8,043.26	-7,278.12	1,866.60	7,500.50	0.61	0.60	-0.09
19,126.00	90.50	180.46	8,043.16	-7,373.11	1,865.84	7,593.61	0.93	0.93	0.00
19,222.00	90.99	180.42	8,041.92	-7,469.10	1,865.10	7,687.70	0.51	0.51	-0.04
19,317.00	91.69	180.29	8,039.69	-7,564.07	1,864.51	7,780.82	0.75	0.74	-0.14
19,346.93	91.05	180.38	8,038.98	-7,594.00	1,864.33	7,810.15	2.16	-2.14	0.32
<b>Cross @ 19346.93' MD</b>									
19,412.00	89.66	180.59	8,038.57	-7,659.06	1,863.78	7,873.92	2.16	-2.14	0.32
19,506.00	88.64	180.11	8,039.97	-7,753.05	1,863.21	7,966.07	1.20	-1.09	-0.51
19,601.00	89.57	182.31	8,041.45	-7,848.01	1,861.20	8,058.91	2.51	0.98	2.32
19,696.00	90.81	182.31	8,041.14	-7,942.93	1,857.37	8,151.36	1.31	1.31	0.00
19,790.00	91.87	181.74	8,038.94	-8,036.84	1,854.05	8,242.91	1.28	1.13	-0.61
19,885.00	91.60	181.43	8,036.06	-8,131.76	1,851.43	8,335.59	0.43	-0.28	-0.33
19,979.00	91.69	181.34	8,033.37	-8,225.69	1,849.15	8,427.37	0.14	0.10	-0.10
20,075.00	92.53	181.78	8,029.83	-8,321.59	1,846.54	8,521.01	0.99	0.88	0.46
20,170.00	90.99	180.42	8,026.91	-8,416.53	1,844.72	8,613.85	2.16	-1.62	-1.43
20,264.00	88.33	178.88	8,027.47	-8,510.51	1,845.29	8,706.22	3.27	-2.83	-1.64
20,359.00	87.67	178.65	8,030.79	-8,605.43	1,847.34	8,799.79	0.74	-0.69	-0.24
20,453.00	87.23	178.79	8,034.97	-8,699.31	1,849.44	8,892.35	0.49	-0.47	0.15

## Survey Report

<b>Company:</b>	Extraction Oil & Gas	<b>Local Co-ordinate Reference:</b>	Well Livingston S20-25-3N
<b>Project:</b>	Weld County, CO (NAD83)	<b>TVD Reference:</b>	KB @ 5358.20usft (Patterson 901)
<b>Site:</b>	Sec 07-T01S-R68W Livingston Pad	<b>MD Reference:</b>	KB @ 5358.20usft (Patterson 901)
<b>Well:</b>	Livingston S20-25-3N	<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)	
20,549.00	86.48	177.77	8,040.24	-8,795.12	1,852.31	8,986.95	1.32	-0.78	-1.06	
20,643.00	87.27	176.54	8,045.36	-8,888.87	1,856.97	9,079.86	1.55	0.84	-1.31	
20,737.00	87.80	178.39	8,049.40	-8,982.68	1,861.13	9,172.75	2.05	0.56	1.97	
20,831.00	88.20	178.26	8,052.68	-9,076.59	1,863.87	9,265.45	0.45	0.43	-0.14	
20,926.00	89.17	178.83	8,054.86	-9,171.53	1,866.28	9,359.11	1.18	1.02	0.60	
21,021.00	89.31	177.91	8,056.12	-9,266.48	1,868.99	9,452.84	0.98	0.15	-0.97	
21,116.00	89.62	177.51	8,057.01	-9,361.40	1,872.78	9,546.74	0.53	0.33	-0.42	
21,210.00	90.32	177.51	8,057.06	-9,455.31	1,876.87	9,639.71	0.74	0.74	0.00	
21,305.00	91.07	177.07	8,055.91	-9,550.20	1,881.36	9,733.71	0.92	0.79	-0.46	
21,400.00	92.40	177.33	8,053.03	-9,645.04	1,886.00	9,827.69	1.43	1.40	0.27	
Last MWD Survey @ 21400' MD										
21,485.00	92.40	177.33	8,049.47	-9,729.87	1,889.95	9,911.73	0.00	0.00	0.00	
Projection to TD @ 21485' MD 2136' FNL/ 579.5' FWL										

Design Targets										
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude	
30° Inclination @ 8644.7	0.00	0.00	7,606.99	2,980.18	1,812.95	1,238,362.04	3,130,961.92	39.986741	-105.032624	
- actual wellpath misses target center by 0.01usft at 8644.80usft MD (7606.99 TVD, 2980.18 N, 1812.94 E)										
- Point										
70° Inclination @ 9073.7	0.00	0.00	7,884.72	2,664.85	1,805.08	1,238,046.67	3,130,955.69	39.985875	-105.032652	
- actual wellpath hits target center										
- Point										
Cross @ 14076.58' MD	0.00	0.00	7,979.37	-2,326.00	1,817.53	1,233,055.95	3,130,994.08	39.972175	-105.032609	
- actual wellpath hits target center										
- Point										
Cross @ 19346.93' MD	0.00	0.00	8,038.98	-7,594.00	1,864.33	1,227,788.27	3,131,068.26	39.957713	-105.032444	
- actual wellpath hits target center										
- Point										

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
1,592.00	1,550.27	241.20	153.50	Tie into Surface Surveys	
1,663.00	1,613.96	267.93	169.97	First MWD Survey @ 1663' MD	
8,644.79	7,606.99	2,980.19	1,812.94	30° Inclination @ 8644.79' MD	
9,073.77	7,884.72	2,664.85	1,805.08	70° Inclination @ 9073.77' MD	
14,076.58	7,979.37	-2,326.00	1,817.53	Cross @ 14076.58' MD	
19,346.93	8,038.98	-7,594.00	1,864.33	Cross @ 19346.93' MD	
21,400.00	8,053.03	-9,645.04	1,886.00	Last MWD Survey @ 21400' MD	
21,485.00	8,049.47	-9,729.87	1,889.95	Projection to TD @ 21485' MD 2136' FNL/ 579.5' FWL	



## Survey Report

<b>Company:</b>	Extraction Oil & Gas	<b>Local Co-ordinate Reference:</b>	Well Livingston S20-25-3N
<b>Project:</b>	Weld County, CO (NAD83)	<b>TVD Reference:</b>	KB @ 5358.20usft (Patterson 901)
<b>Site:</b>	Sec 07-T01S-R68W Livingston Pad	<b>MD Reference:</b>	KB @ 5358.20usft (Patterson 901)
<b>Well:</b>	Livingston S20-25-3N	<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

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