

Extraction Oil & Gas

Weld County, CO (NAD83)

Sec 07-T01S-R68W Livingston Pad

Livingston S20-25-2C

Wellbore #1

Design: Wellbore #1

Standard Survey Report

20 November, 2019

Survey Report

Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Livingston S20-25-2C
Project:	Weld County, CO (NAD83)	TVD Reference:	KB @ 5357.30usft (Patterson 901)
Site:	Sec 07-T01S-R68W Livingston Pad	MD Reference:	KB @ 5357.30usft (Patterson 901)
Well:	Livingston S20-25-2C	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.15 Single User Db

Project	Weld County, CO (NAD83),		
Map System:	US State Plane 1983	System Datum:	Ground Level
Geo Datum:	North American Datum 1983		
Map Zone:	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 S20-25-2C				
Well Position	+N/-S	0.00 usft	Northing:	1,235,372.38 usft	Latitude:	39.978560
	+E/-W	0.00 usft	Easting:	3,129,146.27 usft	Longitude:	-105.039159
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	5,328.30 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	10/23/2019	8.07	66.42	51,832.26515389

Design	Wellbore #1				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.00	0.00	0.00	170.90	

Survey Program	Date	11/20/2019			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
130.00	21,685.00	Atlas MWD Surveys (Wellbore #1)	MWD	MWD - Standard	

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)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
130.00	0.31	102.77	130.00	-0.08	0.34	0.13	0.24	0.24	0.00
First MWD Survey @ 130.00' MD									
220.00	0.49	130.58	220.00	-0.38	0.87	0.52	0.29	0.20	30.90
312.00	0.49	141.29	311.99	-0.94	1.42	1.16	0.10	0.00	11.64
406.00	2.34	45.35	405.97	0.09	3.03	0.39	2.60	1.97	-102.06
502.00	5.39	33.28	501.74	5.24	6.90	-4.08	3.27	3.18	-12.57
597.00	5.79	29.75	596.29	13.13	11.73	-11.11	0.56	0.42	-3.72
693.00	7.16	29.00	691.67	22.57	17.03	-19.59	1.43	1.43	-0.78
789.00	9.01	24.02	786.72	34.67	22.99	-30.59	2.06	1.93	-5.19
884.00	10.47	21.11	880.34	49.51	29.13	-44.28	1.62	1.54	-3.06

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Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	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	12.68	19.48	974.39	67.59	35.79	-61.08	2.33	2.30	-1.70
1,075.00	15.07	22.52	1,066.61	88.83	44.00	-80.75	2.63	2.52	3.20
1,170.00	16.79	23.98	1,157.96	112.77	54.30	-102.77	1.86	1.81	1.54
1,266.00	19.05	24.77	1,249.29	139.67	66.50	-127.40	2.37	2.35	0.82
1,360.00	21.39	27.42	1,337.50	168.82	80.83	-153.91	2.67	2.49	2.82
1,455.00	21.21	26.58	1,426.01	199.57	96.50	-181.79	0.37	-0.19	-0.88
1,550.00	22.76	26.53	1,514.10	231.38	112.39	-210.69	1.63	1.63	-0.05
1,608.00	23.50	25.75	1,567.43	251.83	122.43	-229.30	1.38	1.28	-1.34
1,757.00	21.74	25.61	1,704.97	303.48	147.26	-276.37	1.18	-1.18	-0.09
1,853.00	24.08	29.13	1,793.39	336.62	164.49	-306.37	2.82	2.44	3.67
1,948.00	25.98	29.22	1,879.47	371.72	184.08	-337.92	2.00	2.00	0.09
2,044.00	28.37	26.31	1,964.87	410.52	204.46	-373.02	2.85	2.49	-3.03
2,138.00	31.42	25.12	2,046.35	452.73	224.76	-411.49	3.31	3.24	-1.27
2,233.00	28.99	23.80	2,128.45	496.23	244.57	-451.30	2.65	-2.56	-1.39
2,327.00	30.49	23.45	2,210.06	538.95	263.25	-490.53	1.61	1.60	-0.37
2,421.00	32.74	26.58	2,290.11	583.57	284.12	-531.28	2.96	2.39	3.33
2,516.00	33.54	28.03	2,369.66	629.71	307.95	-573.08	1.19	0.84	1.53
2,612.00	34.16	27.24	2,449.39	677.08	332.75	-615.93	0.79	0.65	-0.82
2,707.00	30.89	25.30	2,529.48	722.86	355.38	-657.55	3.61	-3.44	-2.04
2,801.00	32.35	27.11	2,609.53	767.06	377.16	-697.75	1.85	1.55	1.93
2,896.00	35.00	30.02	2,688.58	813.29	402.38	-739.41	3.27	2.79	3.06
2,991.00	32.39	28.21	2,767.62	859.31	428.04	-780.79	2.94	-2.75	-1.91
3,086.00	31.73	27.77	2,848.13	903.83	451.71	-821.01	0.74	-0.69	-0.46
3,182.00	31.99	26.93	2,929.67	948.84	474.99	-861.77	0.54	0.27	-0.88
3,277.00	33.14	26.40	3,009.73	994.54	497.93	-903.27	1.25	1.21	-0.56
3,372.00	33.50	27.77	3,089.11	1,041.00	521.69	-945.38	0.88	0.38	1.44
3,468.00	33.50	30.59	3,169.17	1,087.25	547.52	-986.97	1.62	0.00	2.94
3,563.00	31.86	28.39	3,249.13	1,131.88	572.78	-1,027.04	2.13	-1.73	-2.32
3,658.00	29.78	25.48	3,330.72	1,175.24	594.86	-1,066.36	2.69	-2.19	-3.06
3,754.00	29.30	29.22	3,414.25	1,217.27	616.58	-1,104.42	1.98	-0.50	3.90
3,849.00	30.71	32.97	3,496.52	1,257.91	641.14	-1,140.67	2.47	1.48	3.95
3,944.00	29.25	31.07	3,578.81	1,298.14	666.32	-1,176.42	1.83	-1.54	-2.00
4,039.00	30.05	29.05	3,661.37	1,338.82	689.85	-1,212.86	1.35	0.84	-2.13
4,134.00	30.53	27.11	3,743.40	1,381.09	712.39	-1,251.04	1.15	0.51	-2.04
4,230.00	27.80	24.37	3,827.23	1,423.20	732.75	-1,289.39	3.17	-2.84	-2.85
4,325.00	28.94	25.70	3,910.82	1,464.09	751.86	-1,326.75	1.37	1.20	1.40
4,420.00	28.94	28.16	3,993.96	1,505.07	772.67	-1,363.92	1.25	0.00	2.59
4,516.00	30.00	26.09	4,077.54	1,547.10	794.19	-1,402.02	1.53	1.10	-2.16
4,611.00	28.86	30.28	4,160.29	1,588.24	816.20	-1,439.15	2.48	-1.20	4.41
4,706.00	30.80	30.90	4,242.70	1,628.91	840.25	-1,475.51	2.07	2.04	0.65
4,802.00	30.89	25.56	4,325.13	1,672.24	863.51	-1,514.62	2.85	0.09	-5.56
4,897.00	33.14	25.34	4,405.68	1,717.71	885.15	-1,556.10	2.37	2.37	-0.23
4,993.00	35.57	24.11	4,484.93	1,766.92	907.79	-1,601.11	2.63	2.53	-1.28

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Survey										
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5,088.00	36.19	22.52	4,561.90	1,818.05	929.82	-1,648.11	1.18	0.65	-1.67	
5,184.00	34.78	25.12	4,640.07	1,869.03	952.30	-1,694.89	2.15	-1.47	2.71	
5,278.00	32.35	23.67	4,718.40	1,916.35	973.78	-1,738.21	2.72	-2.59	-1.54	
5,374.00	33.89	23.89	4,798.80	1,964.35	994.93	-1,782.26	1.61	1.60	0.23	
5,491.00	30.31	20.85	4,897.90	2,021.78	1,018.66	-1,835.22	3.36	-3.06	-2.60	
5,587.00	31.02	22.26	4,980.48	2,067.32	1,036.65	-1,877.33	1.05	0.74	1.47	
5,682.00	32.26	25.61	5,061.36	2,112.84	1,056.89	-1,919.08	2.26	1.31	3.53	
5,778.00	32.61	23.76	5,142.39	2,159.62	1,078.38	-1,961.87	1.10	0.36	-1.93	
5,873.00	34.38	24.77	5,221.61	2,207.41	1,099.94	-2,005.65	1.95	1.86	1.06	
5,969.00	32.88	24.20	5,301.54	2,255.79	1,121.98	-2,049.94	1.60	-1.56	-0.59	
6,065.00	32.04	27.94	5,382.55	2,302.06	1,144.59	-2,092.05	2.27	-0.88	3.90	
6,160.00	31.24	28.65	5,463.43	2,345.94	1,168.21	-2,131.64	0.93	-0.84	0.75	
6,255.00	31.60	29.75	5,544.50	2,389.17	1,192.37	-2,170.51	0.71	0.38	1.16	
6,351.00	31.15	30.85	5,626.46	2,432.32	1,217.59	-2,209.13	0.76	-0.47	1.15	
6,445.00	32.79	29.57	5,706.20	2,475.34	1,242.62	-2,247.64	1.89	1.74	-1.36	
6,540.00	30.71	28.52	5,786.98	2,519.03	1,266.90	-2,286.94	2.27	-2.19	-1.11	
6,636.00	30.18	28.69	5,869.74	2,561.73	1,290.18	-2,325.43	0.56	-0.55	0.18	
6,731.00	30.00	30.99	5,951.94	2,603.04	1,313.88	-2,362.47	1.23	-0.19	2.42	
6,826.00	29.08	27.86	6,034.60	2,643.82	1,336.90	-2,399.09	1.89	-0.97	-3.29	
6,921.00	31.15	28.34	6,116.77	2,685.86	1,359.35	-2,437.05	2.19	2.18	0.51	
7,017.00	30.84	27.68	6,199.06	2,729.50	1,382.57	-2,476.48	0.48	-0.32	-0.69	
7,112.00	28.15	25.83	6,281.75	2,771.25	1,403.65	-2,514.36	2.99	-2.83	-1.95	
7,207.00	25.41	25.83	6,366.55	2,809.77	1,422.30	-2,549.45	2.88	-2.88	0.00	
7,302.00	23.38	27.11	6,453.06	2,844.90	1,439.77	-2,581.37	2.21	-2.14	1.35	
7,398.00	20.55	23.93	6,542.09	2,877.26	1,455.29	-2,610.87	3.20	-2.95	-3.31	
7,493.00	19.09	30.46	6,631.47	2,905.90	1,469.93	-2,636.83	2.79	-1.54	6.87	
7,589.00	15.64	28.12	6,723.08	2,930.85	1,483.99	-2,659.25	3.67	-3.59	-2.44	
7,684.00	15.73	35.04	6,814.55	2,952.69	1,497.42	-2,678.69	1.97	0.09	7.28	
7,780.00	13.48	30.63	6,907.45	2,972.98	1,510.59	-2,696.63	2.61	-2.34	-4.59	
7,875.00	11.45	28.65	7,000.20	2,990.78	1,520.76	-2,712.61	2.18	-2.14	-2.08	
7,970.00	9.01	23.23	7,093.69	3,005.89	1,528.21	-2,726.35	2.76	-2.57	-5.71	
8,066.00	7.11	20.45	7,188.74	3,018.37	1,533.26	-2,737.87	2.02	-1.98	-2.90	
8,161.00	4.51	17.06	7,283.24	3,027.45	1,536.41	-2,746.34	2.76	-2.74	-3.57	
8,257.00	3.54	14.94	7,379.00	3,033.92	1,538.28	-2,752.43	1.02	-1.01	-2.21	
8,352.00	2.56	9.17	7,473.87	3,038.85	1,539.37	-2,757.13	1.08	-1.03	-6.07	
8,447.00	1.19	324.39	7,568.82	3,041.75	1,539.14	-2,760.03	2.01	-1.44	-47.14	
8,543.00	3.71	198.53	7,664.76	3,039.61	1,537.57	-2,758.17	4.70	2.63	-131.10	
8,638.00	11.27	179.67	7,758.89	3,027.40	1,536.64	-2,746.25	8.26	7.96	-19.85	
8,734.00	16.35	178.96	7,852.08	3,004.49	1,536.94	-2,723.58	5.29	5.29	-0.74	
8,829.00	24.08	180.20	7,941.16	2,971.69	1,537.12	-2,691.17	8.15	8.14	1.31	
8,922.78	30.00	180.33	8,024.66	2,929.08	1,536.92	-2,649.12	6.31	6.31	0.14	
30° Inclination @ 8922.78' MD										
8,925.00	30.14	180.33	8,026.58	2,927.96	1,536.91	-2,648.03	6.31	6.31	0.11	

Survey Report

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Site:	Sec 07-T01S-R68W Livingston Pad	MD Reference:	KB @ 5357.30usft (Patterson 901)
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9,020.00	35.44	179.84	8,106.41	2,876.53	1,536.85	-2,597.25	5.59	5.58	-0.52	
9,115.00	44.94	176.14	8,178.91	2,815.37	1,539.19	-2,536.49	10.31	10.00	-3.89	
9,211.00	62.66	176.72	8,235.38	2,738.35	1,543.95	-2,459.69	18.46	18.46	0.60	
9,249.96	70.00	178.02	8,251.02	2,702.73	1,545.57	-2,424.26	19.07	18.83	3.35	
70° Inclination @ 9249.96' MD										
9,306.00	80.56	179.71	8,265.24	2,648.62	1,546.62	-2,370.67	19.07	18.85	3.01	
9,401.00	89.22	180.20	8,273.69	2,554.09	1,546.70	-2,277.31	9.13	9.12	0.52	
9,496.00	89.93	179.62	8,274.40	2,459.10	1,546.84	-2,183.49	0.97	0.75	-0.61	
9,591.00	88.69	179.49	8,275.54	2,364.11	1,547.58	-2,089.58	1.31	-1.31	-0.14	
9,686.00	89.17	179.27	8,277.31	2,269.13	1,548.61	-1,995.63	0.56	0.51	-0.23	
9,780.00	89.40	178.92	8,278.49	2,175.15	1,550.10	-1,902.60	0.45	0.24	-0.37	
9,876.00	90.37	178.30	8,278.68	2,079.18	1,552.42	-1,807.47	1.20	1.01	-0.65	
9,971.00	89.48	179.89	8,278.80	1,984.19	1,553.92	-1,713.45	1.92	-0.94	1.67	
10,067.00	89.40	179.18	8,279.74	1,888.20	1,554.70	-1,618.54	0.74	-0.08	-0.74	
10,162.00	89.04	178.30	8,281.04	1,793.24	1,556.79	-1,524.44	1.00	-0.38	-0.93	
10,257.00	89.09	178.21	8,282.59	1,698.29	1,559.68	-1,430.23	0.11	0.05	-0.09	
10,352.00	89.13	176.89	8,284.06	1,603.39	1,563.74	-1,335.88	1.39	0.04	-1.39	
10,447.00	89.13	180.81	8,285.51	1,508.44	1,565.65	-1,241.83	4.13	0.00	4.13	
10,542.00	89.26	180.55	8,286.84	1,413.46	1,564.52	-1,148.22	0.31	0.14	-0.27	
10,638.00	89.48	178.92	8,287.90	1,317.47	1,564.97	-1,053.36	1.71	0.23	-1.70	
10,733.00	89.48	178.13	8,288.76	1,222.50	1,567.41	-959.21	0.83	0.00	-0.83	
10,827.00	89.09	180.02	8,289.93	1,128.53	1,568.93	-866.18	2.05	-0.41	2.01	
10,923.00	88.73	177.38	8,291.76	1,032.58	1,571.11	-771.09	2.77	-0.38	-2.75	
11,018.00	90.28	181.34	8,292.58	937.61	1,572.17	-677.15	4.48	1.63	4.17	
11,114.00	91.21	181.56	8,291.33	841.65	1,569.74	-582.78	1.00	0.97	0.23	
11,209.00	88.29	181.74	8,291.74	746.70	1,567.00	-489.46	3.08	-3.07	0.19	
11,304.00	88.38	181.34	8,294.50	651.78	1,564.45	-396.13	0.43	0.09	-0.42	
11,399.00	89.31	180.73	8,296.42	556.81	1,562.74	-302.64	1.17	0.98	-0.64	
11,494.00	89.88	180.20	8,297.09	461.82	1,561.97	-208.96	0.82	0.60	-0.56	
11,590.00	90.63	179.36	8,296.66	365.82	1,562.33	-114.11	1.17	0.78	-0.88	
11,685.00	89.22	179.49	8,296.79	270.83	1,563.29	-20.16	1.49	-1.48	0.14	
11,780.00	89.79	179.40	8,297.61	175.84	1,564.21	73.78	0.61	0.60	-0.09	
11,875.00	90.50	179.32	8,297.37	80.84	1,565.27	167.74	0.75	0.75	-0.08	
11,971.00	88.95	179.89	8,297.83	-15.15	1,565.93	262.63	1.72	-1.61	0.59	
12,066.00	89.70	179.18	8,298.95	-110.14	1,566.70	356.55	1.09	0.79	-0.75	
12,162.00	89.62	178.48	8,299.52	-206.12	1,568.66	451.63	0.73	-0.08	-0.73	
12,257.00	90.19	177.77	8,299.68	-301.06	1,571.77	545.87	0.96	0.60	-0.75	
12,353.00	88.91	179.54	8,300.43	-397.03	1,574.02	640.98	2.28	-1.33	1.84	
12,448.00	90.06	179.93	8,301.28	-492.02	1,574.46	734.85	1.28	1.21	0.41	
12,544.00	90.59	179.71	8,300.74	-588.02	1,574.76	829.69	0.60	0.55	-0.23	
12,640.00	89.35	181.17	8,300.79	-684.01	1,574.03	924.36	2.00	-1.29	1.52	
12,735.00	90.06	180.73	8,301.28	-779.00	1,572.45	1,017.90	0.88	0.75	-0.46	
12,831.00	90.32	180.24	8,300.96	-874.99	1,571.64	1,112.56	0.58	0.27	-0.51	
12,926.00	88.64	180.24	8,301.82	-969.99	1,571.24	1,206.29	1.77	-1.77	0.00	

Survey Report

Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Livingston S20-25-2C
Project:	Weld County, CO (NAD83)	TVD Reference:	KB @ 5357.30usft (Patterson 901)
Site:	Sec 07-T01S-R68W Livingston Pad	MD Reference:	KB @ 5357.30usft (Patterson 901)
Well:	Livingston S20-25-2C	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	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)
13,021.00	89.04	179.89	8,303.75	-1,064.97	1,571.13	1,300.06	0.56	0.42	-0.37
13,117.00	89.40	178.83	8,305.05	-1,160.95	1,572.21	1,395.00	1.17	0.38	-1.10
13,212.00	89.31	178.04	8,306.12	-1,255.91	1,574.80	1,489.17	0.84	-0.09	-0.83
13,308.00	89.84	177.11	8,306.83	-1,351.82	1,578.86	1,584.52	1.11	0.55	-0.97
13,403.00	87.76	178.96	8,308.82	-1,446.73	1,582.12	1,678.75	2.93	-2.19	1.95
13,499.00	88.42	178.48	8,312.02	-1,542.65	1,584.26	1,773.81	0.85	0.69	-0.50
13,594.00	89.22	180.68	8,313.98	-1,637.62	1,584.96	1,867.69	2.46	0.84	2.32
13,690.00	89.93	180.55	8,314.69	-1,733.61	1,583.93	1,962.31	0.75	0.74	-0.14
13,785.00	89.93	179.05	8,314.81	-1,828.61	1,584.26	2,056.17	1.58	0.00	-1.58
13,880.00	90.59	178.61	8,314.38	-1,923.59	1,586.20	2,150.26	0.83	0.69	-0.46
13,975.00	89.66	181.83	8,314.17	-2,018.58	1,585.83	2,243.99	3.53	-0.98	3.39
14,070.00	90.50	181.56	8,314.04	-2,113.53	1,583.02	2,337.31	0.93	0.88	-0.28
14,165.00	89.13	181.61	8,314.34	-2,208.49	1,580.40	2,430.66	1.44	-1.44	0.05
14,260.00	89.57	180.77	8,315.42	-2,303.47	1,578.42	2,524.12	1.00	0.46	-0.88
14,282.54	89.24	180.58	8,315.65	-2,326.00	1,578.16	2,546.33	1.66	-1.44	-0.83
Cross @ 14282.54' MD									
14,355.00	88.20	179.98	8,317.27	-2,398.44	1,577.80	2,617.80	1.66	-1.44	-0.83
14,450.00	89.26	179.80	8,319.38	-2,493.42	1,577.98	2,711.61	1.13	1.12	-0.19
14,545.00	89.88	178.21	8,320.09	-2,588.40	1,579.63	2,805.66	1.80	0.65	-1.67
14,641.00	90.06	178.04	8,320.14	-2,684.35	1,582.78	2,900.89	0.26	0.19	-0.18
14,736.00	88.95	177.86	8,320.96	-2,779.28	1,586.17	2,995.17	1.18	-1.17	-0.19
14,831.00	90.41	180.33	8,321.49	-2,874.26	1,587.67	3,089.19	3.02	1.54	2.60
14,926.00	90.54	181.39	8,320.70	-2,969.24	1,586.25	3,182.75	1.12	0.14	1.12
15,021.00	89.35	180.95	8,320.79	-3,064.22	1,584.31	3,276.23	1.34	-1.25	-0.46
15,116.00	89.40	180.59	8,321.83	-3,159.21	1,583.03	3,369.82	0.38	0.05	-0.38
15,211.00	89.97	179.80	8,322.35	-3,254.20	1,582.71	3,463.57	1.03	0.60	-0.83
15,306.00	90.94	180.68	8,321.60	-3,349.20	1,582.31	3,557.30	1.38	1.02	0.93
15,400.00	89.26	182.80	8,321.43	-3,443.14	1,579.46	3,649.62	2.88	-1.79	2.26
15,496.00	87.72	182.93	8,323.96	-3,538.99	1,574.66	3,743.50	1.61	-1.60	0.14
15,591.00	88.73	181.96	8,326.91	-3,633.85	1,570.61	3,836.53	1.47	1.06	-1.02
15,687.00	89.35	181.43	8,328.51	-3,729.80	1,567.77	3,930.81	0.85	0.65	-0.55
15,782.00	90.06	180.86	8,329.00	-3,824.78	1,565.87	4,024.30	0.96	0.75	-0.60
15,877.00	88.91	181.39	8,329.86	-3,919.75	1,564.01	4,117.78	1.33	-1.21	0.56
15,972.00	89.44	180.90	8,331.23	-4,014.72	1,562.11	4,211.26	0.76	0.56	-0.52
16,067.00	90.06	180.24	8,331.64	-4,109.72	1,561.16	4,304.91	0.95	0.65	-0.69
16,162.00	90.90	179.49	8,330.84	-4,204.71	1,561.39	4,398.74	1.19	0.88	-0.79
16,256.00	89.79	180.20	8,330.28	-4,298.71	1,561.64	4,491.59	1.40	-1.18	0.76
16,352.00	90.50	179.40	8,330.04	-4,394.70	1,561.98	4,586.44	1.11	0.74	-0.83
16,447.00	90.15	179.89	8,329.50	-4,489.70	1,562.57	4,680.33	0.63	-0.37	0.52
16,542.00	89.66	181.08	8,329.65	-4,584.70	1,561.76	4,774.00	1.35	-0.52	1.25
16,637.00	90.15	180.51	8,329.81	-4,679.69	1,560.44	4,867.59	0.79	0.52	-0.60
16,733.00	89.35	181.21	8,330.23	-4,775.67	1,559.00	4,962.14	1.11	-0.83	0.73
16,828.00	89.40	181.43	8,331.27	-4,870.64	1,556.81	5,055.57	0.24	0.05	0.23

Survey Report

Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Livingston S20-25-2C
Project:	Weld County, CO (NAD83)	TVD Reference:	KB @ 5357.30usft (Patterson 901)
Site:	Sec 07-T01S-R68W Livingston Pad	MD Reference:	KB @ 5357.30usft (Patterson 901)
Well:	Livingston S20-25-2C	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	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)
16,924.00	89.31	180.81	8,332.35	-4,966.62	1,554.94	5,150.04	0.65	-0.09	-0.65
17,019.00	87.98	180.24	8,334.59	-5,061.58	1,554.07	5,243.67	1.52	-1.40	-0.60
17,114.00	89.04	179.62	8,337.06	-5,156.55	1,554.18	5,337.46	1.29	1.12	-0.65
17,209.00	90.15	179.14	8,337.74	-5,251.54	1,555.21	5,431.42	1.27	1.17	-0.51
17,304.00	87.94	179.40	8,339.32	-5,346.51	1,556.42	5,525.38	2.34	-2.33	0.27
17,398.00	88.38	178.83	8,342.34	-5,440.45	1,557.87	5,618.37	0.77	0.47	-0.61
17,494.00	89.09	177.73	8,344.46	-5,536.38	1,560.75	5,713.55	1.36	0.74	-1.15
17,589.00	89.75	176.98	8,345.42	-5,631.28	1,565.14	5,807.94	1.05	0.69	-0.79
17,684.00	90.28	176.32	8,345.39	-5,726.11	1,570.69	5,902.46	0.89	0.56	-0.69
17,779.00	89.48	176.94	8,345.59	-5,820.95	1,576.27	5,996.99	1.07	-0.84	0.65
17,875.00	89.57	177.38	8,346.39	-5,916.83	1,581.03	6,092.41	0.47	0.09	0.46
17,970.00	88.69	179.62	8,347.83	-6,011.78	1,583.52	6,186.56	2.53	-0.93	2.36
18,066.00	89.53	179.01	8,349.32	-6,107.76	1,584.66	6,281.51	1.08	0.88	-0.64
18,161.00	89.53	179.14	8,350.10	-6,202.74	1,586.20	6,375.54	0.14	0.00	0.14
18,257.00	89.70	180.73	8,350.75	-6,298.73	1,586.31	6,470.35	1.67	0.18	1.66
18,353.00	88.95	180.90	8,351.88	-6,394.72	1,584.94	6,564.91	0.80	-0.78	0.18
18,448.00	89.09	181.12	8,353.50	-6,489.69	1,583.27	6,658.42	0.27	0.15	0.23
18,544.00	90.28	181.30	8,354.03	-6,585.66	1,581.24	6,752.86	1.25	1.24	0.19
18,640.00	88.47	181.43	8,355.08	-6,681.63	1,578.95	6,847.26	1.89	-1.89	0.14
18,735.00	87.72	181.08	8,358.23	-6,776.55	1,576.87	6,940.66	0.87	-0.79	-0.37
18,830.00	88.47	180.81	8,361.39	-6,871.49	1,575.31	7,034.15	0.84	0.79	-0.28
18,926.00	89.57	181.21	8,363.03	-6,967.45	1,573.62	7,128.64	1.22	1.15	0.42
19,021.00	90.63	181.21	8,362.87	-7,062.43	1,571.61	7,222.11	1.12	1.12	0.00
19,117.00	89.40	180.81	8,362.84	-7,158.41	1,569.92	7,316.61	1.35	-1.28	-0.42
19,212.00	88.20	181.08	8,364.83	-7,253.38	1,568.35	7,410.14	1.29	-1.26	0.28
19,308.00	89.00	180.90	8,367.18	-7,349.34	1,566.69	7,504.62	0.85	0.83	-0.19
19,404.00	89.70	180.90	8,368.27	-7,445.32	1,565.18	7,599.16	0.73	0.73	0.00
19,498.00	89.79	180.24	8,368.69	-7,539.31	1,564.25	7,691.82	0.71	0.10	-0.70
19,552.69	90.22	180.14	8,368.68	-7,594.00	1,564.07	7,745.79	0.81	0.79	-0.18
Cross @ 19552.69' MD									
19,593.00	90.54	180.07	8,368.41	-7,634.31	1,563.99	7,785.58	0.81	0.79	-0.18
19,688.00	88.25	180.68	8,369.42	-7,729.30	1,563.37	7,879.27	2.49	-2.41	0.64
19,782.00	88.60	180.33	8,372.00	-7,823.26	1,562.54	7,971.92	0.53	0.37	-0.37
19,877.00	89.13	179.89	8,373.88	-7,918.24	1,562.36	8,065.68	0.73	0.56	-0.46
19,971.00	90.77	180.33	8,373.96	-8,012.23	1,562.18	8,158.46	1.81	1.74	0.47
20,066.00	89.62	180.77	8,373.64	-8,107.23	1,561.27	8,252.12	1.30	-1.21	0.46
20,161.00	89.17	181.34	8,374.64	-8,202.20	1,559.52	8,345.62	0.76	-0.47	0.60
20,256.00	89.88	181.39	8,375.43	-8,297.17	1,557.26	8,439.04	0.75	0.75	0.05
20,351.00	89.13	180.64	8,376.25	-8,392.15	1,555.57	8,532.56	1.12	-0.79	-0.79
20,445.00	90.41	180.46	8,376.63	-8,486.15	1,554.67	8,625.22	1.38	1.36	-0.19
20,540.00	89.35	179.18	8,376.83	-8,581.14	1,554.97	8,719.07	1.75	-1.12	-1.35
20,635.00	89.84	179.05	8,377.50	-8,676.13	1,556.44	8,813.09	0.53	0.52	-0.14
20,730.00	91.03	179.14	8,376.78	-8,771.11	1,557.94	8,907.12	1.26	1.25	0.09
20,824.00	89.09	179.58	8,376.68	-8,865.10	1,558.99	9,000.09	2.12	-2.06	0.47

Survey Report

Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Livingston S20-25-2C
Project:	Weld County, CO (NAD83)	TVD Reference:	KB @ 5357.30usft (Patterson 901)
Site:	Sec 07-T01S-R68W Livingston Pad	MD Reference:	KB @ 5357.30usft (Patterson 901)
Well:	Livingston S20-25-2C	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	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)	
20,918.00	89.22	179.23	8,378.07	-8,959.09	1,559.96	9,093.05	0.40	0.14	-0.37	
21,012.00	90.37	179.10	8,378.40	-9,053.07	1,561.33	9,186.07	1.23	1.22	-0.14	
21,107.00	89.70	179.49	8,378.34	-9,148.07	1,562.50	9,280.05	0.82	-0.71	0.41	
21,202.00	88.07	179.93	8,380.19	-9,243.04	1,562.98	9,373.91	1.78	-1.72	0.46	
21,297.00	88.82	180.42	8,382.77	-9,338.01	1,562.69	9,467.63	0.94	0.79	0.52	
21,391.00	89.40	180.95	8,384.23	-9,431.99	1,561.57	9,560.25	0.84	0.62	0.56	
21,487.00	88.91	180.29	8,385.65	-9,527.97	1,560.53	9,654.86	0.86	-0.51	-0.69	
21,581.00	90.01	180.81	8,386.53	-9,621.96	1,559.63	9,747.52	1.29	1.17	0.55	
21,622.00	90.59	180.99	8,386.32	-9,662.95	1,558.98	9,787.90	1.48	1.41	0.44	
Last MWD Survey @ 21622' MD										
21,685.00	90.59	180.99	8,385.67	-9,725.94	1,557.90	9,849.92	0.00	0.00	0.00	
Projection to TD @ 21685' MD 2131' FNL/ 229' 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 @ 8922.7	0.00	0.00	8,024.66	2,929.07	1,536.92	1,238,309.40	3,130,667.94	39.986601	-105.033674	
- hit/miss target										
- Shape										
- Point										
70° Inclination @ 9249.9	0.00	0.00	8,251.01	2,702.74	1,545.60	1,238,083.12	3,130,677.80	39.985979	-105.033643	
- actual wellpath misses target center by 0.03usft at 9249.96usft MD (8251.01 TVD, 2702.74 N, 1545.57 E)										
- Point										
Cross @ 14282.54' MD	0.00	0.00	8,315.65	-2,326.00	1,578.16	1,233,054.61	3,130,736.49	39.972175	-105.033528	
- actual wellpath hits target center										
- Point										
Cross @ 19552.69' MD	0.00	0.00	8,368.68	-7,594.00	1,564.07	1,227,786.61	3,130,749.78	39.957713	-105.033580	
- actual wellpath hits target center										
- Point										

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
130.00	130.00	-0.08	0.34	First MWD Survey @ 130.00' MD	
8,922.78	8,024.66	2,929.08	1,536.92	30° Inclination @ 8922.78' MD	
9,249.96	8,251.02	2,702.73	1,545.57	70° Inclination @ 9249.96' MD	
14,282.54	8,315.65	-2,326.00	1,578.16	Cross @ 14282.54' MD	
19,552.69	8,368.68	-7,594.00	1,564.07	Cross @ 19552.69' MD	
21,622.00	8,386.32	-9,662.95	1,558.98	Last MWD Survey @ 21622' MD	
21,685.00	8,385.67	-9,725.94	1,557.90	Projection to TD @ 21685' MD 2131' FNL/ 229' FWL	

Checked By: _____ Approved By: _____ Date: _____