

Extraction Oil & Gas

Weld County, CO (NAD83)

Sec 07-T01S-R68W Livingston Pad

Livingston S19-25-02C

Wellbore #1

Design: Wellbore #1

Standard Survey Report

07 August, 2019

Survey Report

Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Livingston S19-25-02C
Project:	Weld County, CO (NAD83)	TVD Reference:	KB @ 5345.60usft (Patterson 901)
Site:	Sec 07-T01S-R68W Livingston Pad	MD Reference:	KB @ 5345.60usft (Patterson 901)
Well:	Livingston S19-25-02C	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 S19-25-02C					
Well Position	+N/-S	0.00 usft	Northing:	1,235,372.53 usft	Latitude:	39.978564
	+E/-W	0.00 usft	Easting:	3,128,894.33 usft	Longitude:	-105.040058
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	5,316.60 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	6/28/2019	8.10	66.42	51,868.58293189

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	193.56	

Survey Program	Date	8/7/2019			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
143.00	1,586.00	Surface Surveys (Wellbore #1)	MWD	MWD - Standard	
1,705.00	21,773.00	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	
143.00	0.83	95.04	143.00	-0.09	1.03	-0.15	0.58	0.58	0.00	
230.00	0.57	310.28	229.99	0.13	1.33	-0.44	1.54	-0.30	-166.39	
317.00	2.59	289.10	316.96	1.06	-0.86	-0.83	2.38	2.32	-24.34	
405.00	4.00	287.69	404.81	2.64	-5.66	-1.24	1.60	1.60	-1.60	
492.00	5.58	288.31	491.50	4.89	-12.57	-1.81	1.82	1.82	0.71	
579.00	7.73	286.02	577.91	7.83	-22.21	-2.41	2.49	2.47	-2.63	
666.00	8.66	283.03	664.02	10.93	-34.21	-2.60	1.18	1.07	-3.44	
754.00	10.63	281.80	750.77	14.08	-48.62	-2.29	2.25	2.24	-1.40	
841.00	12.48	282.51	836.01	17.76	-65.65	-1.87	2.13	2.13	0.82	

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Well:	Livingston S19-25-02C	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)
928.00	14.37	280.84	920.62	21.82	-85.43	-1.18	2.22	2.17	-1.92
1,016.00	16.17	281.19	1,005.51	26.26	-108.18	-0.16	2.05	2.05	0.40
1,103.00	17.93	281.27	1,088.69	31.22	-133.20	0.88	2.02	2.02	0.09
1,190.00	20.00	282.94	1,170.96	37.17	-160.83	1.58	2.46	2.38	1.92
1,277.00	21.97	284.88	1,252.19	44.69	-191.07	1.36	2.40	2.26	2.23
1,365.00	22.54	286.55	1,333.63	53.72	-223.14	0.11	0.97	0.65	1.90
1,452.00	22.19	285.67	1,414.09	62.91	-254.95	-1.37	0.56	-0.40	-1.01
1,539.00	24.39	283.21	1,494.00	71.45	-288.26	-1.86	2.76	2.53	-2.83
1,586.00	25.93	282.86	1,536.54	75.95	-307.72	-1.68	3.29	3.28	-0.74
Tie into Surface Surveys									
1,705.00	25.36	283.30	1,643.81	87.61	-357.89	-1.24	0.51	-0.48	0.37
First MWD Survey @ 1705' MD									
1,800.00	24.57	280.13	1,729.94	95.76	-397.13	0.03	1.64	-0.83	-3.34
1,896.00	25.67	279.16	1,816.86	102.58	-437.31	2.82	1.22	1.15	-1.01
1,991.00	26.34	279.29	1,902.24	109.26	-478.43	5.97	0.71	0.71	0.14
2,086.00	26.20	281.41	1,987.43	116.81	-519.78	8.33	1.00	-0.15	2.23
2,181.00	25.59	285.33	2,072.90	126.39	-560.13	8.49	1.91	-0.64	4.13
2,276.00	25.36	287.40	2,158.66	137.89	-599.33	6.49	0.97	-0.24	2.18
2,370.00	27.97	286.96	2,242.66	150.35	-639.63	3.84	2.78	2.78	-0.47
2,464.00	25.45	284.98	2,326.62	162.00	-680.23	2.03	2.84	-2.68	-2.11
2,559.00	27.49	283.83	2,411.66	172.52	-721.25	1.42	2.21	2.15	-1.21
2,654.00	24.92	281.67	2,496.89	181.81	-762.15	1.98	2.89	-2.71	-2.27
2,750.00	26.38	284.14	2,583.43	191.11	-802.64	2.43	1.88	1.52	2.57
2,844.00	28.19	286.78	2,666.97	202.62	-844.15	0.97	2.32	1.93	2.81
2,938.00	25.67	283.74	2,750.78	213.87	-885.19	-0.34	3.05	-2.68	-3.23
3,034.00	27.09	285.33	2,836.78	224.59	-926.47	-1.08	1.65	1.48	1.66
3,129.00	23.33	284.58	2,922.72	235.05	-965.56	-2.08	3.97	-3.96	-0.79
3,225.00	25.14	285.28	3,010.25	245.21	-1,003.63	-3.03	1.91	1.89	0.73
3,320.00	25.50	283.17	3,096.13	255.18	-1,043.00	-3.49	1.02	0.38	-2.22
3,415.00	25.76	284.80	3,181.78	265.12	-1,082.88	-3.80	0.79	0.27	1.72
3,510.00	26.38	283.79	3,267.11	275.42	-1,123.33	-4.33	0.80	0.65	-1.06
3,605.00	27.22	283.12	3,351.91	285.38	-1,164.99	-4.24	0.94	0.88	-0.71
3,701.00	22.32	282.11	3,439.05	294.20	-1,204.22	-3.61	5.12	-5.10	-1.05
3,796.00	23.86	287.27	3,526.45	303.69	-1,240.21	-4.40	2.68	1.62	5.43
3,892.00	26.69	288.19	3,613.25	316.19	-1,279.24	-7.40	2.98	2.95	0.96
3,987.00	26.73	286.56	3,698.11	328.93	-1,319.99	-10.23	0.77	0.04	-1.72
4,082.00	27.80	283.43	3,782.56	340.17	-1,362.02	-11.30	1.88	1.13	-3.29
4,177.00	26.43	282.68	3,867.12	349.96	-1,404.20	-10.92	1.49	-1.44	-0.79
4,273.00	23.91	285.37	3,954.00	359.81	-1,443.81	-11.21	2.88	-2.63	2.80
4,368.00	24.30	286.08	4,040.71	370.32	-1,481.15	-12.68	0.51	0.41	0.75
4,463.00	25.81	279.91	4,126.79	379.30	-1,520.32	-12.22	3.17	1.59	-6.49
4,558.00	26.16	283.30	4,212.19	387.67	-1,561.07	-10.80	1.61	0.37	3.57
4,654.00	29.39	282.86	4,297.12	397.79	-1,604.64	-10.42	3.37	3.36	-0.46

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Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
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Survey										
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4,749.00	25.28	282.68	4,381.49	407.43	-1,647.18	-9.82	4.33	-4.33	-0.19	
4,844.00	26.73	282.02	4,466.87	416.34	-1,687.87	-8.93	1.56	1.53	-0.69	
4,940.00	27.71	279.51	4,552.24	424.52	-1,731.00	-6.78	1.57	1.02	-2.61	
5,035.00	29.08	282.02	4,635.81	432.98	-1,775.37	-4.59	1.91	1.44	2.64	
5,131.00	24.75	281.54	4,721.39	441.86	-1,817.89	-3.26	4.52	-4.51	-0.50	
5,227.00	23.64	285.50	4,808.96	451.03	-1,856.13	-3.20	2.05	-1.16	4.13	
5,321.00	29.17	284.18	4,893.13	461.68	-1,896.54	-4.08	5.92	5.88	-1.40	
5,416.00	27.84	280.88	4,976.61	471.54	-1,940.77	-3.30	2.17	-1.40	-3.47	
5,535.00	32.13	285.02	5,079.67	485.00	-1,998.66	-2.80	4.00	3.61	3.48	
5,631.00	28.99	283.52	5,162.33	497.05	-2,045.94	-3.43	3.37	-3.27	-1.56	
5,726.00	25.45	282.86	5,246.80	506.98	-2,088.24	-3.17	3.74	-3.73	-0.69	
5,822.00	24.88	285.46	5,333.69	516.96	-2,127.81	-3.58	1.30	-0.59	2.71	
5,917.00	25.32	285.90	5,419.71	527.85	-2,166.61	-5.07	0.50	0.46	0.46	
6,013.00	27.00	284.62	5,505.88	538.97	-2,207.45	-6.31	1.85	1.75	-1.33	
6,109.00	27.62	283.83	5,591.18	549.79	-2,250.14	-6.82	0.75	0.65	-0.82	
6,204.00	23.95	280.26	5,676.71	558.50	-2,290.51	-5.81	4.19	-3.86	-3.76	
6,299.00	25.36	282.95	5,763.05	566.49	-2,329.32	-4.48	1.90	1.48	2.83	
6,395.00	28.19	282.51	5,848.75	576.01	-2,371.50	-3.85	2.96	2.95	-0.46	
6,489.00	24.79	284.98	5,932.87	585.92	-2,412.22	-3.93	3.80	-3.62	2.63	
6,584.00	27.13	289.38	6,018.29	598.26	-2,451.91	-6.62	3.19	2.46	4.63	
6,680.00	30.36	288.19	6,102.45	613.10	-2,495.61	-10.80	3.42	3.36	-1.24	
6,775.00	25.54	287.27	6,186.34	626.68	-2,538.00	-14.06	5.09	-5.07	-0.97	
6,870.00	24.70	290.22	6,272.36	639.62	-2,576.19	-17.69	1.59	-0.88	3.11	
6,965.00	24.97	288.63	6,358.57	652.89	-2,613.81	-21.76	0.76	0.28	-1.67	
7,061.00	20.81	287.58	6,446.99	664.51	-2,649.29	-24.75	4.35	-4.33	-1.09	
7,156.00	16.79	288.54	6,536.91	673.98	-2,678.40	-27.12	4.24	-4.23	1.01	
7,251.00	13.52	289.16	6,628.59	681.99	-2,701.90	-29.39	3.45	-3.44	0.65	
7,346.00	10.83	287.31	6,721.45	688.29	-2,720.91	-31.06	2.86	-2.83	-1.95	
7,442.00	13.21	277.26	6,815.35	692.36	-2,740.41	-30.45	3.29	2.48	-10.47	
7,537.00	14.58	269.95	6,907.57	693.72	-2,763.14	-26.44	2.34	1.44	-7.69	
7,633.00	11.53	272.20	7,001.08	694.08	-2,784.81	-21.71	3.22	-3.18	2.34	
7,728.00	15.33	272.20	7,093.46	694.93	-2,806.86	-17.36	4.00	4.00	0.00	
7,824.00	12.46	273.74	7,186.65	696.09	-2,829.88	-13.09	3.01	-2.99	1.60	
7,919.00	8.97	273.96	7,279.97	697.27	-2,847.50	-10.11	3.67	-3.67	0.23	
8,014.00	6.58	273.21	7,374.09	698.09	-2,860.32	-7.89	2.52	-2.52	-0.79	
8,110.00	4.91	273.12	7,469.61	698.62	-2,869.92	-6.16	1.74	-1.74	-0.09	
8,205.00	2.39	288.72	7,564.41	699.47	-2,875.86	-5.60	2.83	-2.65	16.42	
8,301.00	1.68	281.05	7,660.35	700.39	-2,879.13	-5.72	0.79	-0.74	-7.99	
8,396.00	5.35	226.28	7,755.17	697.59	-2,883.70	-1.93	4.83	3.86	-57.65	
8,491.00	12.42	220.06	7,848.98	686.70	-2,893.49	10.95	7.50	7.44	-6.55	
8,586.00	23.29	203.94	7,939.32	661.62	-2,907.74	38.67	12.47	11.44	-16.97	
8,648.60	29.74	190.65	7,995.35	635.00	-2,915.64	66.40	13.95	10.31	-21.24	
30° Inclination @ 8648.60' MD										
8,682.00	33.58	185.60	8,023.78	617.65	-2,918.08	83.84	13.95	11.49	-15.11	

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8,778.00	41.85	180.98	8,099.67	559.10	-2,921.22	141.50	9.10	8.61	-4.81	
8,873.00	49.23	177.63	8,166.17	491.37	-2,920.27	207.12	8.16	7.77	-3.53	
8,969.00	60.63	178.20	8,221.24	412.98	-2,917.45	282.66	11.88	11.88	0.59	
9,059.62	70.00	178.89	8,259.04	330.76	-2,915.37	362.10	10.36	10.34	0.76	
70° Inclination @ 9059.62' MD										
9,063.00	70.35	178.91	8,260.19	327.58	-2,915.31	365.18	10.36	10.34	0.70	
9,159.00	78.79	179.04	8,285.71	235.14	-2,913.66	454.66	8.79	8.79	0.14	
9,254.00	88.07	180.36	8,296.57	140.87	-2,913.18	546.18	9.87	9.77	1.39	
9,349.00	91.21	180.23	8,297.16	45.88	-2,913.67	638.63	3.31	3.31	-0.14	
9,444.00	92.80	179.96	8,293.84	-49.06	-2,913.82	730.96	1.70	1.67	-0.28	
9,539.00	89.09	178.95	8,292.27	-144.02	-2,912.92	823.07	4.05	-3.91	-1.06	
9,603.00	89.09	178.29	8,293.29	-208.00	-2,911.38	884.90	1.03	0.00	-1.03	
9,698.00	89.04	180.49	8,294.84	-302.97	-2,910.37	976.99	2.32	-0.05	2.32	
9,792.00	89.26	180.40	8,296.24	-396.96	-2,911.10	1,068.52	0.25	0.23	-0.10	
9,887.00	89.35	181.20	8,297.39	-491.94	-2,912.43	1,161.17	0.85	0.09	0.84	
9,983.00	89.57	176.97	8,298.29	-587.90	-2,910.89	1,254.10	4.41	0.23	-4.41	
10,078.00	90.32	178.82	8,298.38	-682.83	-2,907.40	1,345.56	2.10	0.79	1.95	
10,173.00	90.28	174.67	8,297.89	-777.66	-2,902.01	1,436.48	4.37	-0.04	-4.37	
10,268.00	89.00	175.86	8,298.48	-872.33	-2,894.17	1,526.67	1.84	-1.35	1.25	
10,364.00	88.33	179.21	8,300.72	-968.20	-2,890.04	1,618.90	3.56	-0.70	3.49	
10,458.00	88.82	181.46	8,303.06	-1,062.16	-2,890.59	1,710.37	2.45	0.52	2.39	
10,554.00	89.22	185.47	8,304.70	-1,157.95	-2,896.39	1,804.85	4.20	0.42	4.18	
10,649.00	90.06	186.18	8,305.30	-1,252.46	-2,906.03	1,898.98	1.16	0.88	0.75	
10,744.00	90.19	185.74	8,305.09	-1,346.95	-2,915.90	1,993.15	0.48	0.14	-0.46	
10,839.00	89.97	182.03	8,304.96	-1,441.71	-2,922.33	2,086.78	3.91	-0.23	-3.91	
10,934.00	90.15	180.01	8,304.86	-1,536.69	-2,924.02	2,179.51	2.13	0.19	-2.13	
11,030.00	90.28	178.42	8,304.50	-1,632.68	-2,922.71	2,272.51	1.66	0.14	-1.66	
11,125.00	90.06	175.56	8,304.22	-1,727.54	-2,917.72	2,363.56	3.02	-0.23	-3.01	
11,220.00	89.79	177.94	8,304.34	-1,822.38	-2,912.33	2,454.49	2.52	-0.28	2.51	
11,315.00	90.06	176.79	8,304.47	-1,917.27	-2,907.97	2,545.72	1.24	0.28	-1.21	
11,411.00	90.23	177.36	8,304.22	-2,013.15	-2,903.07	2,637.77	0.62	0.18	0.59	
11,506.00	91.87	174.63	8,302.48	-2,107.89	-2,896.44	2,728.31	3.35	1.73	-2.87	
11,601.00	90.15	172.65	8,300.81	-2,202.28	-2,885.91	2,817.60	2.76	-1.81	-2.08	
11,696.00	88.82	175.95	8,301.66	-2,296.79	-2,876.48	2,907.27	3.74	-1.40	3.47	
11,737.30	89.13	176.68	8,302.40	-2,338.00	-2,873.83	2,946.71	1.92	0.75	1.77	
Cross @ 11737.30' MD										
11,791.00	89.53	177.63	8,303.03	-2,391.63	-2,871.16	2,998.21	1.92	0.75	1.77	
11,887.00	90.37	178.02	8,303.11	-2,487.56	-2,867.52	3,090.62	0.96	0.88	0.41	
11,982.00	89.97	179.39	8,302.83	-2,582.53	-2,865.37	3,182.44	1.50	-0.42	1.44	
12,078.00	90.10	184.11	8,302.77	-2,678.46	-2,868.30	3,276.38	4.92	0.14	4.92	
12,173.00	90.99	187.10	8,301.87	-2,772.99	-2,877.58	3,370.45	3.28	0.94	3.15	
12,269.00	90.37	184.72	8,300.73	-2,868.47	-2,887.46	3,465.58	2.56	-0.65	-2.48	
12,365.00	90.10	182.74	8,300.34	-2,964.26	-2,893.71	3,560.16	2.08	-0.28	-2.06	

Survey Report

Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Livingston S19-25-02C
Project:	Weld County, CO (NAD83)	TVD Reference:	KB @ 5345.60usft (Patterson 901)
Site:	Sec 07-T01S-R68W Livingston Pad	MD Reference:	KB @ 5345.60usft (Patterson 901)
Well:	Livingston S19-25-02C	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)
12,460.00	90.19	181.33	8,300.09	-3,059.19	-2,897.08	3,653.24	1.49	0.09	-1.48
12,556.00	90.77	180.98	8,299.29	-3,155.17	-2,899.02	3,747.00	0.71	0.60	-0.36
12,651.00	90.46	179.61	8,298.27	-3,250.16	-2,899.50	3,839.45	1.48	-0.33	-1.44
12,747.00	90.54	179.04	8,297.43	-3,346.15	-2,898.37	3,932.50	0.60	0.08	-0.59
12,843.00	90.15	178.86	8,296.85	-3,442.13	-2,896.61	4,025.40	0.45	-0.41	-0.19
12,938.00	90.50	179.13	8,296.32	-3,537.12	-2,894.95	4,117.34	0.47	0.37	0.28
13,033.00	90.63	179.43	8,295.38	-3,632.10	-2,893.75	4,209.40	0.34	0.14	0.32
13,128.00	89.70	178.82	8,295.11	-3,727.09	-2,892.30	4,301.40	1.17	-0.98	-0.64
13,224.00	89.40	180.05	8,295.86	-3,823.08	-2,891.36	4,394.49	1.32	-0.31	1.28
13,320.00	89.48	179.92	8,296.80	-3,919.08	-2,891.33	4,487.80	0.16	0.08	-0.14
13,415.00	89.44	179.13	8,297.69	-4,014.07	-2,890.54	4,579.96	0.83	-0.04	-0.83
13,511.00	89.79	178.73	8,298.34	-4,110.05	-2,888.75	4,672.85	0.55	0.36	-0.42
13,606.00	89.70	178.60	8,298.76	-4,205.02	-2,886.54	4,764.65	0.17	-0.09	-0.14
13,701.00	89.31	180.45	8,299.58	-4,300.01	-2,885.75	4,856.81	1.99	-0.41	1.95
13,797.00	89.48	179.65	8,300.60	-4,396.01	-2,885.84	4,950.14	0.85	0.18	-0.83
13,892.00	89.84	178.77	8,301.16	-4,490.99	-2,884.53	5,042.18	1.00	0.38	-0.93
13,987.00	89.84	177.98	8,301.42	-4,585.95	-2,881.83	5,133.86	0.83	0.00	-0.83
14,082.00	89.44	178.07	8,302.02	-4,680.90	-2,878.56	5,225.38	0.43	-0.42	0.09
14,177.00	90.23	178.73	8,302.30	-4,775.86	-2,875.90	5,317.08	1.08	0.83	0.69
14,272.00	90.32	177.67	8,301.84	-4,870.81	-2,872.92	5,408.68	1.12	0.09	-1.12
14,367.00	90.10	177.67	8,301.49	-4,965.73	-2,869.06	5,500.05	0.23	-0.23	0.00
14,462.00	90.19	178.02	8,301.25	-5,060.66	-2,865.49	5,591.50	0.38	0.09	0.37
14,557.00	88.38	178.68	8,302.44	-5,155.61	-2,862.75	5,683.16	2.03	-1.91	0.69
14,652.00	89.70	181.77	8,304.03	-5,250.58	-2,863.12	5,775.57	3.54	1.39	3.25
14,747.00	89.17	181.51	8,304.96	-5,345.54	-2,865.84	5,868.51	0.62	-0.56	-0.27
14,842.00	89.62	180.84	8,305.97	-5,440.51	-2,867.79	5,961.30	0.85	0.47	-0.71
14,937.00	89.66	179.70	8,306.56	-5,535.51	-2,868.24	6,053.75	1.20	0.04	-1.20
15,032.00	89.88	179.57	8,306.95	-5,630.50	-2,867.63	6,145.95	0.27	0.23	-0.14
15,128.00	88.91	180.40	8,307.96	-5,726.50	-2,867.61	6,239.27	1.33	-1.01	0.86
15,222.00	89.13	180.80	8,309.57	-5,820.48	-2,868.59	6,330.86	0.49	0.23	0.43
15,317.00	89.79	180.71	8,310.46	-5,915.47	-2,869.84	6,423.49	0.70	0.69	-0.09
15,412.00	89.48	181.02	8,311.07	-6,010.45	-2,871.28	6,516.16	0.46	-0.33	0.33
15,508.00	90.19	181.86	8,311.34	-6,106.42	-2,873.69	6,610.02	1.15	0.74	0.88
15,603.00	89.93	179.83	8,311.25	-6,201.40	-2,875.09	6,702.69	2.15	-0.27	-2.14
15,698.00	90.63	180.32	8,310.78	-6,296.40	-2,875.22	6,795.06	0.90	0.74	0.52
15,793.00	90.01	180.36	8,310.25	-6,391.40	-2,875.78	6,887.54	0.65	-0.65	0.04
15,889.00	90.63	182.47	8,309.71	-6,487.36	-2,878.15	6,981.39	2.29	0.65	2.20
15,983.00	90.01	180.93	8,309.19	-6,581.32	-2,880.94	7,073.38	1.77	-0.66	-1.64
16,078.00	89.93	180.45	8,309.24	-6,676.31	-2,882.08	7,165.99	0.51	-0.08	-0.51
16,173.00	90.10	181.37	8,309.21	-6,771.30	-2,883.59	7,258.68	0.98	0.18	0.97
16,267.00	90.32	181.59	8,308.87	-6,865.26	-2,886.02	7,350.60	0.33	0.23	0.23
16,363.00	89.97	180.98	8,308.63	-6,961.24	-2,888.17	7,444.40	0.73	-0.36	-0.64
16,459.00	90.15	181.15	8,308.53	-7,057.22	-2,889.96	7,538.13	0.26	0.19	0.18
16,553.00	89.88	182.69	8,308.50	-7,151.17	-2,893.11	7,630.19	1.66	-0.29	1.64

Survey Report

Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Livingston S19-25-02C
Project:	Weld County, CO (NAD83)	TVD Reference:	KB @ 5345.60usft (Patterson 901)
Site:	Sec 07-T01S-R68W Livingston Pad	MD Reference:	KB @ 5345.60usft (Patterson 901)
Well:	Livingston S19-25-02C	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)
16,649.00	89.70	180.18	8,308.85	-7,247.13	-2,895.51	7,724.04	2.62	-0.19	-2.61
16,744.00	89.48	182.52	8,309.53	-7,342.09	-2,897.75	7,816.88	2.47	-0.23	2.46
16,840.00	89.04	182.17	8,310.77	-7,438.00	-2,901.68	7,911.04	0.59	-0.46	-0.36
16,935.00	89.75	182.17	8,311.78	-7,532.93	-2,905.27	8,004.16	0.75	0.75	0.00
17,005.11	89.75	181.71	8,312.08	-7,603.00	-2,907.65	8,072.83	0.65	0.00	-0.65
Cross @ 17005.11' MD									
17,030.00	89.75	181.55	8,312.19	-7,627.88	-2,908.36	8,097.19	0.65	0.00	-0.65
17,126.00	89.13	181.33	8,313.13	-7,723.84	-2,910.77	8,191.04	0.69	-0.65	-0.23
17,221.00	89.17	181.33	8,314.54	-7,818.81	-2,912.97	8,283.87	0.04	0.04	0.00
17,315.00	89.09	180.27	8,315.97	-7,912.79	-2,914.29	8,375.54	1.13	-0.09	-1.13
17,409.00	88.51	181.24	8,317.93	-8,006.76	-2,915.52	8,467.18	1.20	-0.62	1.03
17,505.00	89.22	182.69	8,319.84	-8,102.68	-2,918.81	8,561.20	1.68	0.74	1.51
17,600.00	89.09	181.59	8,321.24	-8,197.60	-2,922.36	8,654.31	1.17	-0.14	-1.16
17,695.00	89.40	179.52	8,322.49	-8,292.58	-2,923.28	8,746.86	2.20	0.33	-2.18
17,791.00	89.13	181.11	8,323.72	-8,388.57	-2,923.81	8,840.29	1.68	-0.28	1.66
17,886.00	89.35	180.36	8,324.98	-8,483.55	-2,925.03	8,932.91	0.82	0.23	-0.79
17,982.00	90.94	180.93	8,324.74	-8,579.54	-2,926.11	9,026.48	1.76	1.66	0.59
18,077.00	92.00	181.24	8,322.30	-8,674.49	-2,927.91	9,119.20	1.16	1.12	0.33
18,173.00	90.59	180.23	8,320.13	-8,770.46	-2,929.14	9,212.78	1.81	-1.47	-1.05
18,268.00	88.07	178.02	8,321.24	-8,865.42	-2,927.69	9,304.76	3.53	-2.65	-2.33
18,363.00	89.09	179.39	8,323.60	-8,960.37	-2,925.54	9,396.55	1.80	1.07	1.44
18,459.00	90.01	181.55	8,324.35	-9,056.35	-2,926.33	9,490.05	2.45	0.96	2.25
18,555.00	91.30	181.90	8,323.25	-9,152.30	-2,929.22	9,584.00	1.39	1.34	0.36
18,650.00	90.32	181.15	8,321.91	-9,247.26	-2,931.75	9,676.90	1.30	-1.03	-0.79
18,746.00	89.97	179.74	8,321.67	-9,343.25	-2,932.49	9,770.39	1.51	-0.36	-1.47
18,841.00	87.94	178.60	8,323.40	-9,438.22	-2,931.12	9,862.39	2.45	-2.14	-1.20
18,936.00	86.13	177.89	8,328.31	-9,533.04	-2,928.21	9,953.89	2.05	-1.91	-0.75
19,032.00	86.26	177.05	8,334.68	-9,628.74	-2,923.98	10,045.92	0.88	0.14	-0.88
19,128.00	88.38	177.94	8,339.17	-9,724.53	-2,919.79	10,138.06	2.39	2.21	0.93
19,223.00	89.44	176.31	8,340.98	-9,819.39	-2,915.03	10,229.16	2.05	1.12	-1.72
19,319.00	88.60	178.51	8,342.62	-9,915.27	-2,910.69	10,321.35	2.45	-0.88	2.29
19,414.00	88.33	181.06	8,345.17	-10,010.23	-2,910.34	10,413.58	2.70	-0.28	2.68
19,509.00	89.53	181.99	8,346.94	-10,105.18	-2,912.86	10,506.47	1.60	1.26	0.98
19,604.00	90.06	180.18	8,347.28	-10,200.16	-2,914.66	10,599.22	1.99	0.56	-1.91
19,698.00	90.90	177.98	8,346.49	-10,294.13	-2,913.15	10,690.23	2.51	0.89	-2.34
19,888.00	90.01	176.53	8,344.98	-10,483.90	-2,904.05	10,872.57	0.90	-0.47	-0.76
19,982.00	89.57	178.07	8,345.33	-10,577.80	-2,899.63	10,962.81	1.70	-0.47	1.64
20,077.00	89.26	180.80	8,346.30	-10,672.78	-2,898.69	11,054.92	2.89	-0.33	2.87
20,171.00	89.57	181.99	8,347.26	-10,766.74	-2,900.98	11,146.80	1.31	0.33	1.27
20,267.00	90.37	183.05	8,347.31	-10,862.65	-2,905.20	11,241.02	1.38	0.83	1.10
20,362.00	89.93	182.47	8,347.06	-10,957.54	-2,909.77	11,334.34	0.77	-0.46	-0.61
20,466.00	89.97	182.08	8,347.15	-11,061.45	-2,913.90	11,436.33	0.38	0.04	-0.38
20,551.00	90.19	181.99	8,347.03	-11,146.40	-2,916.92	11,519.61	0.28	0.26	-0.11

Survey Report

Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Livingston S19-25-02C
Project:	Weld County, CO (NAD83)	TVD Reference:	KB @ 5345.60usft (Patterson 901)
Site:	Sec 07-T01S-R68W Livingston Pad	MD Reference:	KB @ 5345.60usft (Patterson 901)
Well:	Livingston S19-25-02C	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)	
20,645.00	89.35	180.45	8,347.41	-11,240.37	-2,918.92	11,611.44	1.87	-0.89	-1.64	
20,835.00	90.77	184.50	8,347.21	-11,430.15	-2,927.12	11,797.85	2.26	0.75	2.13	
20,929.00	90.23	185.69	8,346.39	-11,523.78	-2,935.47	11,890.82	1.39	-0.57	1.27	
21,023.00	89.62	184.33	8,346.51	-11,617.41	-2,943.68	11,983.77	1.59	-0.65	-1.45	
21,118.00	88.16	182.96	8,348.35	-11,712.20	-2,949.72	12,077.33	2.11	-1.54	-1.44	
21,213.00	88.29	182.21	8,351.30	-11,807.06	-2,954.00	12,170.54	0.80	0.14	-0.79	
21,308.00	88.86	182.39	8,353.66	-11,901.95	-2,957.81	12,263.68	0.63	0.60	0.19	
21,402.00	89.40	182.78	8,355.09	-11,995.84	-2,962.05	12,355.95	0.71	0.57	0.41	
21,497.00	89.70	182.52	8,355.83	-12,090.74	-2,966.44	12,449.23	0.42	0.32	-0.27	
21,592.00	90.63	183.84	8,355.56	-12,185.59	-2,971.71	12,542.67	1.70	0.98	1.39	
21,685.00	90.90	183.62	8,354.32	-12,278.38	-2,977.76	12,634.30	0.37	0.29	-0.24	
21,746.00	91.47	183.27	8,353.06	-12,339.26	-2,981.43	12,694.34	1.10	0.93	-0.57	
Last MWD Survey @ 21746' MD										
21,773.00	91.47	183.27	8,352.36	-12,366.21	-2,982.97	12,720.89	0.00	0.00	0.00	
Projection to TD @ 21773' MD 516' FSL/ 618' 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 @ 8648.6	0.00	0.00	7,995.28	634.95	-2,916.02	1,235,992.34	3,125,975.05	39.980307	-105.050464	
- hit/miss target										
- Shape										
- actual wellpath misses target center by 0.39usft at 8648.60usft MD (7995.35 TVD, 635.00 N, -2915.64 E)										
- Point										
70° Inclination @ 9059.6	0.00	0.00	8,259.04	330.76	-2,915.37	1,235,688.16	3,125,977.28	39.979472	-105.050461	
- actual wellpath hits target center										
- Point										
Cross @ 11737.30' MD	0.00	0.00	8,302.40	-2,338.00	-2,873.83	1,233,019.65	3,126,032.67	39.972145	-105.050312	
- actual wellpath hits target center										
- Point										
Cross @ 17005.11' MD	0.00	0.00	8,312.08	-7,603.00	-2,907.65	1,227,754.55	3,126,026.15	39.957692	-105.050431	
- actual wellpath hits target center										
- Point										

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
1,586.00	1,536.54	75.95	-307.72	Tie into Surface Surveys	
1,705.00	1,643.81	87.61	-357.89	First MWD Survey @ 1705' MD	
8,648.60	7,995.35	635.00	-2,915.64	30° Inclination @ 8648.60' MD	
9,059.62	8,259.04	330.76	-2,915.37	70° Inclination @ 9059.62' MD	
11,737.30	8,302.40	-2,338.00	-2,873.83	Cross @ 11737.30' MD	
17,005.11	8,312.08	-7,603.00	-2,907.65	Cross @ 17005.11' MD	
21,746.00	8,353.06	-12,339.26	-2,981.43	Last MWD Survey @ 21746' MD	
21,773.00	8,352.36	-12,366.21	-2,982.97	Projection to TD @ 21773' MD 516' FSL/ 618' FWL	

Survey Report

Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Livingston S19-25-02C
Project:	Weld County, CO (NAD83)	TVD Reference:	KB @ 5345.60usft (Patterson 901)
Site:	Sec 07-T01S-R68W Livingston Pad	MD Reference:	KB @ 5345.60usft (Patterson 901)
Well:	Livingston S19-25-02C	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.15 Single User Db

Checked By: _____ Approved By: _____ Date: _____