

Extraction Oil & Gas

Weld County, CO (NAD83)

Sec 07-T01S-R68W Livingston Pad

Livingston S20-25-4N

Wellbore #1

Design: Wellbore #1

Standard Survey Report

12 November, 2019

Survey Report

Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Livingston S20-25-4N
Project:	Weld County, CO (NAD83)	TVD Reference:	KB @ 5359.30usft (Patterson 901)
Site:	Sec 07-T01S-R68W Livingston Pad	MD Reference:	KB @ 5359.30usft (Patterson 901)
Well:	Livingston S20-25-4N	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 S20-25-4N				
Well Position	+N/-S	0.00 usft	Northing:	1,235,372.56 usft	Latitude:	39.978560
	+E/-W	0.00 usft	Easting:	3,129,182.42 usft	Longitude:	-105.039030
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	5,330.30 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	9/27/2019	8.07	66.42	51,840.33381860

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	167.58	

Survey Program	Date	11/12/2019			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
143.00	1,615.00	Surface Surveys (Wellbore #1)	MWD	MWD - Standard	
1,758.00	21,585.00	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	0.88	88.53	142.99	0.03	1.10	0.21	0.62	0.62	0.00	
230.00	0.48	34.92	229.99	0.34	1.97	0.09	0.82	-0.46	-61.62	
318.00	1.89	31.49	317.97	1.88	2.94	-1.21	1.60	1.60	-3.90	
405.00	3.12	39.22	404.88	4.94	5.19	-3.71	1.46	1.41	8.89	
492.00	5.67	37.99	491.62	10.16	9.33	-7.92	2.93	2.93	-1.41	
579.00	6.90	35.71	578.10	17.79	15.03	-14.15	1.44	1.41	-2.62	
667.00	9.54	34.48	665.18	28.10	22.24	-22.66	3.01	3.00	-1.40	
754.00	11.47	34.04	750.72	41.21	31.17	-33.54	2.22	2.22	-0.51	
841.00	13.14	34.74	835.72	56.51	41.65	-46.23	1.93	1.92	0.80	

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Well:	Livingston S20-25-4N	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)
929.00	14.59	32.46	921.15	74.08	53.30	-60.88	1.76	1.65	-2.59
1,016.00	16.66	34.04	1,004.94	93.66	66.16	-77.24	2.43	2.38	1.82
1,103.00	18.41	35.71	1,087.89	115.15	81.16	-95.00	2.09	2.01	1.92
1,190.00	19.73	37.55	1,170.11	137.95	98.13	-113.62	1.67	1.52	2.11
1,278.00	20.17	36.85	1,252.83	161.87	116.28	-133.07	0.57	0.50	-0.80
1,365.00	21.58	36.76	1,334.12	186.69	134.85	-153.32	1.62	1.62	-0.10
1,452.00	25.09	35.71	1,413.99	214.49	155.20	-176.09	4.06	4.03	-1.21
1,539.00	26.28	37.47	1,492.40	244.76	177.68	-200.81	1.62	1.37	2.02
1,615.00	28.26	36.85	1,559.95	272.51	198.71	-223.40	2.63	2.61	-0.82
Tie into Surface Surveys									
1,758.00	31.24	37.33	1,684.08	329.10	241.51	-269.46	2.09	2.08	0.34
First MWD Survey @ 1758' MD									
1,853.00	35.53	36.05	1,763.39	371.03	272.71	-303.69	4.58	4.52	-1.35
1,949.00	38.44	34.47	1,840.07	418.19	306.02	-342.59	3.19	3.03	-1.65
2,044.00	38.36	32.31	1,914.52	467.46	338.49	-383.71	1.41	-0.08	-2.27
2,138.00	38.05	30.37	1,988.39	517.10	368.73	-425.69	1.32	-0.33	-2.06
2,233.00	37.52	28.25	2,063.47	567.85	397.23	-469.12	1.48	-0.56	-2.23
2,327.00	35.84	28.78	2,138.86	617.19	424.03	-511.54	1.82	-1.79	0.56
2,422.00	34.16	32.17	2,216.68	664.15	451.62	-551.47	2.70	-1.77	3.57
2,516.00	35.09	34.86	2,294.04	708.66	481.12	-588.60	1.90	0.99	2.86
2,635.00	33.67	33.54	2,392.25	764.23	518.90	-634.74	1.35	-1.19	-1.11
2,731.00	34.34	33.50	2,471.83	808.99	548.55	-672.07	0.70	0.70	-0.04
2,825.00	34.56	37.11	2,549.35	852.36	579.27	-707.82	2.18	0.23	3.84
2,920.00	32.39	36.41	2,628.59	894.33	610.63	-742.07	2.32	-2.28	-0.74
3,015.00	34.38	36.80	2,707.91	936.29	641.81	-776.34	2.11	2.09	0.41
3,110.00	35.04	35.57	2,786.01	979.95	673.74	-812.11	1.01	0.69	-1.29
3,206.00	32.57	34.20	2,865.77	1,023.75	704.30	-848.31	2.69	-2.57	-1.43
3,301.00	32.88	35.79	2,945.69	1,065.82	733.75	-883.06	0.96	0.33	1.67
3,396.00	33.45	37.77	3,025.22	1,107.43	764.87	-917.01	1.29	0.60	2.08
3,492.00	34.25	36.80	3,104.95	1,149.98	797.26	-951.59	1.01	0.83	-1.01
3,586.00	34.87	35.13	3,182.36	1,193.14	828.57	-987.01	1.20	0.66	-1.78
3,682.00	35.62	32.88	3,260.77	1,239.06	859.54	-1,025.19	1.56	0.78	-2.34
3,778.00	32.74	30.85	3,340.18	1,284.84	888.03	-1,063.77	3.23	-3.00	-2.11
3,873.00	33.19	33.76	3,419.89	1,328.51	915.66	-1,100.48	1.73	0.47	3.06
3,968.00	34.47	35.04	3,498.80	1,372.14	945.55	-1,136.66	1.54	1.35	1.35
4,063.00	34.78	34.95	3,576.98	1,416.36	976.50	-1,173.19	0.33	0.33	-0.09
4,158.00	36.41	32.35	3,654.23	1,462.40	1,007.11	-1,211.56	2.34	1.72	-2.74
4,254.00	34.20	30.90	3,732.57	1,509.62	1,036.22	-1,251.42	2.46	-2.30	-1.51
4,349.00	33.19	31.21	3,811.61	1,554.77	1,063.40	-1,289.67	1.08	-1.06	0.33
4,444.00	32.39	33.50	3,891.48	1,598.23	1,090.92	-1,326.19	1.55	-0.84	2.41
4,539.00	31.77	33.63	3,971.97	1,640.27	1,118.82	-1,361.25	0.66	-0.65	0.14
4,635.00	31.02	38.92	4,053.93	1,680.57	1,148.36	-1,394.25	2.97	-0.78	5.51
4,730.00	31.95	40.59	4,134.94	1,718.70	1,180.10	-1,424.66	1.34	0.98	1.76

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Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
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Survey										
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4,826.00	32.83	38.61	4,216.01	1,758.33	1,212.86	-1,456.32	1.44	0.92	-2.06	
4,921.00	33.14	35.26	4,295.70	1,799.66	1,243.93	-1,490.00	1.95	0.33	-3.53	
5,017.00	34.07	34.86	4,375.66	1,843.15	1,274.45	-1,525.91	1.00	0.97	-0.42	
5,112.00	34.60	33.72	4,454.11	1,887.42	1,304.63	-1,562.65	0.88	0.56	-1.20	
5,208.00	37.47	33.14	4,531.73	1,934.55	1,335.73	-1,601.99	3.01	2.99	-0.60	
5,302.00	39.64	34.16	4,605.23	1,983.31	1,368.20	-1,642.62	2.41	2.31	1.09	
5,397.00	36.72	32.26	4,679.91	2,032.42	1,400.38	-1,683.66	3.31	-3.07	-2.00	
5,493.00	33.63	29.57	4,758.37	2,079.82	1,428.83	-1,723.83	3.60	-3.22	-2.80	
5,588.00	36.24	29.22	4,836.25	2,127.22	1,455.52	-1,764.38	2.76	2.75	-0.37	
5,684.00	37.96	33.28	4,912.82	2,176.68	1,485.58	-1,806.21	3.12	1.79	4.23	
5,780.00	35.57	31.60	4,989.72	2,225.15	1,516.42	-1,846.92	2.70	-2.49	-1.75	
5,875.00	33.36	28.78	5,068.05	2,271.59	1,543.48	-1,886.45	2.87	-2.33	-2.97	
5,970.00	34.11	33.06	5,147.06	2,316.81	1,570.59	-1,924.79	2.62	0.79	4.51	
6,066.00	38.93	35.48	5,224.20	2,363.96	1,602.80	-1,963.91	5.24	5.02	2.52	
6,161.00	38.67	35.30	5,298.23	2,412.49	1,637.28	-2,003.88	0.30	-0.27	-0.19	
6,257.00	35.97	34.29	5,374.57	2,460.27	1,670.50	-2,043.40	2.88	-2.81	-1.05	
6,353.00	32.88	33.67	5,453.75	2,505.26	1,700.84	-2,080.81	3.24	-3.22	-0.65	
6,447.00	34.51	33.76	5,531.95	2,548.64	1,729.78	-2,116.95	1.73	1.73	0.10	
6,542.00	34.42	37.73	5,610.29	2,592.25	1,761.17	-2,152.79	2.37	-0.09	4.18	
6,637.00	33.45	38.21	5,689.11	2,634.06	1,793.80	-2,186.60	1.06	-1.02	0.51	
6,733.00	34.11	36.93	5,768.90	2,676.37	1,826.34	-2,220.92	1.01	0.69	-1.33	
6,828.00	31.33	35.88	5,848.82	2,717.68	1,856.82	-2,254.71	2.99	-2.93	-1.11	
6,923.00	30.93	36.18	5,930.14	2,757.40	1,885.71	-2,287.29	0.45	-0.42	0.32	
7,018.00	27.80	35.57	6,012.92	2,795.14	1,913.02	-2,318.27	3.31	-3.29	-0.64	
7,114.00	24.92	34.51	6,098.93	2,830.02	1,937.50	-2,347.07	3.04	-3.00	-1.10	
7,209.00	25.41	34.20	6,184.92	2,863.37	1,960.30	-2,374.73	0.53	0.52	-0.33	
7,304.00	23.99	33.14	6,271.22	2,896.40	1,982.31	-2,402.26	1.57	-1.49	-1.12	
7,399.00	20.46	32.09	6,359.15	2,926.65	2,001.70	-2,427.63	3.74	-3.72	-1.11	
7,495.00	18.34	33.36	6,449.70	2,953.48	2,018.92	-2,450.13	2.25	-2.21	1.32	
7,590.00	15.02	31.43	6,540.69	2,976.47	2,033.56	-2,469.43	3.54	-3.49	-2.03	
7,686.00	12.11	29.97	6,634.00	2,995.82	2,045.08	-2,485.85	3.05	-3.03	-1.52	
7,781.00	9.54	26.27	6,727.30	3,011.51	2,053.55	-2,499.35	2.80	-2.71	-3.89	
7,877.00	7.03	21.69	6,822.29	3,024.11	2,059.24	-2,510.43	2.70	-2.61	-4.77	
7,972.00	5.48	18.29	6,916.72	3,033.82	2,062.81	-2,519.14	1.68	-1.63	-3.58	
8,067.00	3.84	6.16	7,011.41	3,041.29	2,064.58	-2,526.06	2.00	-1.73	-12.77	
8,163.00	2.96	354.97	7,107.24	3,046.95	2,064.70	-2,531.56	1.14	-0.92	-11.66	
8,258.00	2.12	338.05	7,202.15	3,051.02	2,063.83	-2,535.73	1.18	-0.88	-17.81	
8,354.00	1.90	310.37	7,298.09	3,053.70	2,061.96	-2,538.75	1.03	-0.23	-28.83	
8,449.00	2.08	275.60	7,393.04	3,054.89	2,059.04	-2,540.53	1.26	0.19	-36.60	
8,544.00	10.16	183.02	7,487.52	3,046.67	2,056.88	-2,532.97	11.01	8.51	-97.45	
8,640.00	17.63	176.10	7,580.65	3,023.68	2,057.42	-2,510.40	7.96	7.78	-7.21	
8,735.00	27.49	169.84	7,668.29	2,987.65	2,062.28	-2,474.17	10.67	10.38	-6.59	
8,757.46	30.00	169.24	7,687.98	2,977.03	2,064.24	-2,463.37	11.24	11.16	-2.68	
30° Inclination @ 8757.46' MD										

Survey Report

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8,831.00	38.22	167.77	7,748.82	2,936.66	2,072.51	-2,422.18	11.24	11.18	-2.00	
8,926.00	46.22	173.98	7,819.15	2,873.71	2,082.35	-2,358.58	9.49	8.42	6.54	
9,021.00	57.93	171.82	7,877.44	2,799.50	2,091.71	-2,284.09	12.45	12.33	-2.27	
9,116.00	66.77	171.69	7,921.48	2,716.30	2,103.77	-2,200.25	9.31	9.31	-0.14	
9,177.52	69.98	174.98	7,944.15	2,659.51	2,110.39	-2,143.36	7.21	5.22	5.34	
70° Inclination @ 9177.52' MD										
9,212.00	71.81	176.76	7,955.44	2,627.02	2,112.73	-2,111.13	7.21	5.30	5.17	
9,307.00	77.46	178.26	7,980.60	2,535.54	2,116.69	-2,020.94	6.14	5.95	1.58	
9,402.00	82.32	178.21	7,997.27	2,442.08	2,119.57	-1,929.05	5.12	5.12	-0.05	
9,497.00	85.99	177.91	8,006.95	2,347.65	2,122.77	-1,836.14	3.88	3.86	-0.32	
9,592.00	90.10	179.36	8,010.19	2,252.75	2,125.03	-1,742.98	4.59	4.33	1.53	
9,699.00	89.93	180.42	8,010.16	2,145.76	2,125.24	-1,638.44	1.00	-0.16	0.99	
9,793.00	89.57	182.14	8,010.57	2,051.78	2,123.14	-1,547.12	1.87	-0.38	1.83	
9,888.00	89.62	182.22	8,011.24	1,956.85	2,119.52	-1,455.19	0.10	0.05	0.08	
9,984.00	91.38	181.70	8,010.40	1,860.92	2,116.24	-1,362.20	1.91	1.83	-0.54	
10,079.00	90.90	181.34	8,008.51	1,765.97	2,113.72	-1,270.02	0.63	-0.51	-0.38	
10,174.00	88.38	182.93	8,009.11	1,671.05	2,110.18	-1,178.08	3.14	-2.65	1.67	
10,269.00	89.31	182.93	8,011.02	1,576.19	2,105.33	-1,086.49	0.98	0.98	0.00	
10,365.00	87.98	182.27	8,013.29	1,480.32	2,100.97	-993.80	1.55	-1.39	-0.69	
10,459.00	87.72	181.39	8,016.82	1,386.44	2,097.97	-902.76	0.98	-0.28	-0.94	
10,555.00	88.25	180.99	8,020.20	1,290.52	2,095.98	-809.51	0.69	0.55	-0.42	
10,650.00	89.44	180.46	8,022.11	1,195.55	2,094.78	-717.02	1.37	1.25	-0.56	
10,745.00	88.29	180.29	8,023.99	1,100.57	2,094.16	-624.40	1.22	-1.21	-0.18	
10,840.00	89.00	179.76	8,026.24	1,005.60	2,094.12	-531.66	0.93	0.75	-0.56	
10,935.00	90.37	179.36	8,026.76	910.60	2,094.85	-438.73	1.50	1.44	-0.42	
11,030.00	88.82	180.15	8,027.43	815.61	2,095.25	-345.87	1.83	-1.63	0.83	
11,126.00	89.09	180.11	8,029.18	719.63	2,095.04	-252.18	0.28	0.28	-0.04	
11,221.00	88.03	180.33	8,031.57	624.66	2,094.67	-159.52	1.14	-1.12	0.23	
11,316.00	88.73	179.98	8,034.26	529.70	2,094.41	-66.83	0.82	0.74	-0.37	
11,412.00	88.47	182.14	8,036.60	433.75	2,092.64	26.49	2.27	-0.27	2.25	
11,523.00	90.01	182.00	8,038.07	322.83	2,088.63	133.95	1.39	1.39	-0.13	
11,603.00	87.58	181.21	8,039.76	242.89	2,086.39	211.54	3.19	-3.04	-0.99	
11,698.00	87.19	181.52	8,044.09	148.02	2,084.13	303.70	0.52	-0.41	0.33	
11,794.00	86.79	181.21	8,049.13	52.18	2,081.85	396.81	0.53	-0.42	-0.32	
11,889.00	89.00	179.62	8,052.62	-42.75	2,081.16	489.36	2.87	2.33	-1.67	
11,985.00	89.53	179.27	8,053.85	-138.74	2,082.09	583.31	0.66	0.55	-0.36	
12,080.00	89.79	178.74	8,054.42	-233.72	2,083.74	676.42	0.62	0.27	-0.56	
12,176.00	88.51	178.74	8,055.84	-329.68	2,085.85	770.59	1.33	-1.33	0.00	
12,271.00	88.38	178.88	8,058.42	-424.63	2,087.82	863.74	0.20	-0.14	0.15	
12,367.00	88.29	178.70	8,061.21	-520.57	2,089.85	957.87	0.21	-0.09	-0.19	
12,463.00	88.38	178.04	8,064.00	-616.49	2,092.58	1,052.13	0.69	0.09	-0.69	
12,558.00	88.33	177.42	8,066.73	-711.37	2,096.34	1,145.60	0.65	-0.05	-0.65	
12,654.00	87.85	176.72	8,069.92	-807.19	2,101.24	1,240.24	0.88	-0.50	-0.73	

Survey Report

Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Livingston S20-25-4N
Project:	Weld County, CO (NAD83)	TVD Reference:	KB @ 5359.30usft (Patterson 901)
Site:	Sec 07-T01S-R68W Livingston Pad	MD Reference:	KB @ 5359.30usft (Patterson 901)
Well:	Livingston S20-25-4N	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)
12,749.00	88.07	177.38	8,073.31	-902.01	2,106.13	1,333.88	0.73	0.23	0.69
12,844.00	89.84	178.13	8,075.04	-996.91	2,109.85	1,427.37	2.02	1.86	0.79
12,940.00	89.57	176.94	8,075.53	-1,092.82	2,113.98	1,521.92	1.27	-0.28	-1.24
13,035.00	89.26	176.32	8,076.50	-1,187.65	2,119.56	1,615.73	0.73	-0.33	-0.65
13,131.00	91.03	179.40	8,076.26	-1,283.57	2,123.15	1,710.18	3.70	1.84	3.21
13,226.00	90.63	177.51	8,074.88	-1,378.52	2,125.71	1,803.46	2.03	-0.42	-1.99
13,322.00	90.41	178.35	8,074.01	-1,474.45	2,129.17	1,897.89	0.90	-0.23	0.88
13,417.00	89.93	180.15	8,073.73	-1,569.44	2,130.42	1,990.92	1.96	-0.51	1.89
13,513.00	89.53	180.55	8,074.18	-1,665.44	2,129.83	2,084.54	0.59	-0.42	0.42
13,608.00	88.91	180.20	8,075.48	-1,760.42	2,129.21	2,177.18	0.75	-0.65	-0.37
13,703.00	89.53	181.21	8,076.77	-1,855.41	2,128.04	2,269.68	1.25	0.65	1.06
13,798.00	89.04	180.73	8,077.96	-1,950.38	2,126.43	2,362.09	0.72	-0.52	-0.51
13,893.00	92.05	181.12	8,077.05	-2,045.36	2,124.90	2,454.51	3.19	3.17	0.41
13,988.00	91.65	180.68	8,073.98	-2,140.30	2,123.41	2,546.91	0.63	-0.42	-0.46
14,083.00	90.81	179.80	8,071.95	-2,235.27	2,123.01	2,639.58	1.28	-0.88	-0.93
14,172.73	89.85	179.89	8,071.43	-2,325.00	2,123.26	2,727.26	1.08	-1.07	0.09
Cross @ 14172.73' MD									
14,178.00	89.79	179.89	8,071.45	-2,330.27	2,123.27	2,732.40	1.08	-1.07	0.09
14,273.00	90.32	178.74	8,071.36	-2,425.26	2,124.40	2,825.42	1.33	0.56	-1.21
14,368.00	89.09	180.29	8,071.85	-2,520.25	2,125.21	2,918.36	2.08	-1.29	1.63
14,464.00	88.11	180.20	8,074.19	-2,616.22	2,124.80	3,011.99	1.03	-1.02	-0.09
14,559.00	87.76	180.02	8,077.61	-2,711.16	2,124.61	3,104.67	0.41	-0.37	-0.19
14,654.00	87.41	180.37	8,081.62	-2,806.07	2,124.29	3,197.29	0.52	-0.37	0.37
14,749.00	88.82	178.79	8,084.74	-2,901.01	2,124.99	3,290.16	2.23	1.48	-1.66
14,844.00	88.64	178.21	8,086.85	-2,995.96	2,127.47	3,383.42	0.64	-0.19	-0.61
14,939.00	88.60	178.08	8,089.14	-3,090.88	2,130.55	3,476.78	0.14	-0.04	-0.14
15,034.00	88.25	178.48	8,091.75	-3,185.80	2,133.40	3,570.09	0.56	-0.37	0.42
15,129.00	89.31	177.69	8,093.77	-3,280.72	2,136.57	3,663.48	1.39	1.12	-0.83
15,223.00	88.95	177.29	8,095.20	-3,374.62	2,140.69	3,756.06	0.57	-0.38	-0.43
15,319.00	91.12	178.13	8,095.14	-3,470.54	2,144.52	3,850.56	2.42	2.26	0.88
15,414.00	91.12	180.37	8,093.28	-3,565.51	2,145.77	3,943.57	2.36	0.00	2.36
15,510.00	90.72	180.24	8,091.74	-3,661.49	2,145.26	4,037.20	0.44	-0.42	-0.14
15,605.00	90.54	180.11	8,090.70	-3,756.49	2,144.97	4,129.91	0.23	-0.19	-0.14
15,700.00	90.50	179.71	8,089.83	-3,851.48	2,145.12	4,222.72	0.42	-0.04	-0.42
15,795.00	90.32	182.40	8,089.15	-3,946.45	2,143.37	4,315.09	2.84	-0.19	2.83
15,890.00	89.70	182.62	8,089.14	-4,041.36	2,139.21	4,406.88	0.69	-0.65	0.23
15,985.00	89.17	182.18	8,090.07	-4,136.27	2,135.23	4,498.72	0.73	-0.56	-0.46
16,079.00	88.91	181.87	8,091.65	-4,230.20	2,131.91	4,589.73	0.43	-0.28	-0.33
16,175.00	88.95	181.30	8,093.44	-4,326.15	2,129.25	4,682.86	0.60	0.04	-0.59
16,270.00	88.78	180.99	8,095.32	-4,421.11	2,127.35	4,775.19	0.37	-0.18	-0.33
16,365.00	88.60	180.24	8,097.50	-4,516.08	2,126.34	4,867.72	0.81	-0.19	-0.79
16,460.00	88.51	179.76	8,099.89	-4,611.05	2,126.34	4,960.47	0.51	-0.09	-0.51
16,556.00	88.51	179.54	8,102.39	-4,707.01	2,126.92	5,054.31	0.23	0.00	-0.23
16,651.00	90.06	179.71	8,103.57	-4,802.00	2,127.54	5,147.21	1.64	1.63	0.18

Survey Report

Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Livingston S20-25-4N
Project:	Weld County, CO (NAD83)	TVD Reference:	KB @ 5359.30usft (Patterson 901)
Site:	Sec 07-T01S-R68W Livingston Pad	MD Reference:	KB @ 5359.30usft (Patterson 901)
Well:	Livingston S20-25-4N	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)
16,747.00	90.01	179.36	8,103.51	-4,898.00	2,128.32	5,241.13	0.37	-0.05	-0.36
16,842.00	89.93	179.10	8,103.56	-4,992.99	2,129.60	5,334.17	0.29	-0.08	-0.27
16,937.00	90.06	178.79	8,103.57	-5,087.97	2,131.35	5,427.31	0.35	0.14	-0.33
17,032.00	90.41	180.59	8,103.18	-5,182.97	2,131.86	5,520.19	1.93	0.37	1.89
17,127.00	90.68	180.55	8,102.28	-5,277.96	2,130.92	5,612.75	0.29	0.28	-0.04
17,220.00	90.77	180.11	8,101.10	-5,370.95	2,130.38	5,703.45	0.48	0.10	-0.47
17,316.00	90.85	179.54	8,099.74	-5,466.94	2,130.67	5,797.26	0.60	0.08	-0.59
17,411.00	89.26	178.52	8,099.65	-5,561.92	2,132.28	5,890.36	1.99	-1.67	-1.07
17,506.00	88.47	177.82	8,101.54	-5,656.85	2,135.32	5,983.73	1.11	-0.83	-0.74
17,601.00	89.44	179.27	8,103.27	-5,751.80	2,137.73	6,076.97	1.84	1.02	1.53
17,697.00	89.13	179.01	8,104.47	-5,847.78	2,139.17	6,171.02	0.42	-0.32	-0.27
17,792.00	88.33	178.61	8,106.57	-5,942.74	2,141.14	6,264.17	0.94	-0.84	-0.42
17,888.00	89.13	180.59	8,108.70	-6,038.71	2,141.81	6,358.04	2.22	0.83	2.06
17,983.00	91.34	181.25	8,108.31	-6,133.69	2,140.29	6,450.47	2.43	2.33	0.69
18,079.00	90.68	180.29	8,106.62	-6,229.66	2,139.00	6,543.92	1.21	-0.69	-1.00
18,174.00	89.40	179.10	8,106.55	-6,324.66	2,139.50	6,636.80	1.84	-1.35	-1.25
18,270.00	90.99	180.07	8,106.22	-6,420.65	2,140.20	6,730.70	1.94	1.66	1.01
18,366.00	90.59	178.88	8,104.90	-6,516.64	2,141.08	6,824.63	1.31	-0.42	-1.24
18,461.00	89.66	178.21	8,104.69	-6,611.60	2,143.49	6,917.89	1.21	-0.98	-0.71
18,557.00	93.20	178.70	8,102.30	-6,707.52	2,146.08	7,012.12	3.72	3.69	0.51
18,652.00	92.75	178.04	8,097.37	-6,802.36	2,148.77	7,105.32	0.84	-0.47	-0.69
18,747.00	91.83	179.40	8,093.57	-6,897.25	2,150.89	7,198.45	1.73	-0.97	1.43
18,843.00	92.22	179.01	8,090.18	-6,993.18	2,152.23	7,292.42	0.57	0.41	-0.41
18,938.00	91.07	180.24	8,087.45	-7,088.14	2,152.85	7,385.29	1.77	-1.21	1.29
19,034.00	91.83	179.67	8,085.02	-7,184.11	2,152.92	7,479.02	0.99	0.79	-0.59
19,129.00	88.86	181.48	8,084.45	-7,279.09	2,151.97	7,571.57	3.66	-3.13	1.91
19,225.00	89.22	181.78	8,086.06	-7,375.03	2,149.24	7,664.69	0.49	0.38	0.31
19,320.00	90.23	180.55	8,086.52	-7,470.01	2,147.31	7,757.03	1.68	1.06	-1.29
19,415.00	90.99	181.12	8,085.50	-7,564.99	2,145.92	7,849.49	1.00	0.80	0.60
19,444.02	90.20	181.30	8,085.20	-7,594.00	2,145.31	7,877.69	2.80	-2.73	0.62
Cross @ 19444.02' MD									
19,509.00	88.42	181.70	8,085.99	-7,658.95	2,143.61	7,940.76	2.80	-2.73	0.62
19,603.00	88.51	181.70	8,088.51	-7,752.88	2,140.82	8,031.88	0.10	0.10	0.00
19,698.00	89.13	181.78	8,090.46	-7,847.82	2,137.94	8,123.98	0.66	0.65	0.08
19,792.00	90.63	182.05	8,090.66	-7,941.76	2,134.80	8,215.05	1.62	1.60	0.29
19,888.00	89.09	181.92	8,090.89	-8,037.70	2,131.47	8,308.03	1.61	-1.60	-0.14
19,982.00	89.66	181.78	8,091.92	-8,131.64	2,128.44	8,399.12	0.62	0.61	-0.15
20,077.00	87.85	180.64	8,093.98	-8,226.59	2,126.43	8,491.42	2.25	-1.91	-1.20
20,173.00	87.76	180.24	8,097.66	-8,322.52	2,125.70	8,584.94	0.43	-0.09	-0.42
20,267.00	87.80	179.80	8,101.30	-8,416.45	2,125.66	8,676.66	0.47	0.04	-0.47
20,361.00	87.89	179.93	8,104.84	-8,510.38	2,125.88	8,768.45	0.17	0.10	0.14
20,456.00	89.17	179.76	8,107.27	-8,605.35	2,126.14	8,861.24	1.36	1.35	-0.18
20,552.00	89.00	180.11	8,108.81	-8,701.34	2,126.25	8,955.01	0.41	-0.18	0.36

Survey Report

Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Livingston S20-25-4N
Project:	Weld County, CO (NAD83)	TVD Reference:	KB @ 5359.30usft (Patterson 901)
Site:	Sec 07-T01S-R68W Livingston Pad	MD Reference:	KB @ 5359.30usft (Patterson 901)
Well:	Livingston S20-25-4N	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)	
20,646.00	88.73	179.62	8,110.67	-8,795.32	2,126.47	9,046.84	0.60	-0.29	-0.52	
20,740.00	90.10	179.10	8,111.63	-8,889.31	2,127.52	9,138.85	1.56	1.46	-0.55	
20,834.00	89.53	178.61	8,111.93	-8,983.29	2,129.40	9,231.04	0.80	-0.61	-0.52	
20,929.00	89.31	179.40	8,112.89	-9,078.27	2,131.05	9,324.15	0.86	-0.23	0.83	
21,024.00	90.90	179.62	8,112.72	-9,173.26	2,131.86	9,417.09	1.69	1.67	0.23	
21,119.00	90.06	179.27	8,111.92	-9,268.25	2,132.78	9,510.06	0.96	-0.88	-0.37	
21,213.00	90.46	179.14	8,111.50	-9,362.24	2,134.09	9,602.13	0.45	0.43	-0.14	
21,308.00	90.90	178.88	8,110.37	-9,457.22	2,135.73	9,695.24	0.54	0.46	-0.27	
21,403.00	91.34	178.30	8,108.51	-9,552.17	2,138.06	9,788.47	0.77	0.46	-0.61	
21,496.00	91.87	178.17	8,105.91	-9,645.09	2,140.93	9,879.83	0.59	0.57	-0.14	
Last MWD Survey @ 21496' MD										
21,585.00	91.87	178.17	8,103.00	-9,734.00	2,143.77	9,967.27	0.00	0.00	0.00	
Projection to TD @ 21585' MD 2141' FNL/ 851' 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 @ 8757.4	0.00	0.00	7,687.98	2,977.03	2,064.23	1,238,360.28	3,131,231.15	39.986732	-105.031663	
- actual wellpath misses target center by 0.01usft at 8757.46usft MD (7687.98 TVD, 2977.03 N, 2064.24 E)										
- Point										
70° Inclination @ 9177.5	0.00	0.00	7,944.15	2,659.50	2,110.41	1,238,043.00	3,131,278.97	39.985861	-105.031499	
- actual wellpath misses target center by 0.02usft at 9177.52usft MD (7944.16 TVD, 2659.51 N, 2110.39 E)										
- Point										
Cross @ 14172.73' MD	0.00	0.00	8,071.43	-2,325.00	2,123.26	1,233,058.63	3,131,317.73	39.972177	-105.031454	
- actual wellpath hits target center										
- Point										
Cross @ 19444.02' MD	0.00	0.00	8,085.20	-7,594.00	2,145.31	1,227,789.82	3,131,367.18	39.957713	-105.031377	
- actual wellpath hits target center										
- Point										

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
1,615.00	1,559.95	272.51	198.71	Tie into Surface Surveys	
1,758.00	1,684.08	329.10	241.51	First MWD Survey @ 1758' MD	
8,757.46	7,687.98	2,977.03	2,064.24	30° Inclination @ 8757.46' MD	
9,177.52	7,944.15	2,659.51	2,110.39	70° Inclination @ 9177.52' MD	
14,172.73	8,071.43	-2,325.00	2,123.26	Cross @ 14172.73' MD	
19,444.02	8,085.20	-7,594.00	2,145.31	Cross @ 19444.02' MD	
21,496.00	8,105.91	-9,645.09	2,140.93	Last MWD Survey @ 21496' MD	
21,585.00	8,103.00	-9,734.00	2,143.77	Projection to TD @ 21585' MD 2141' FNL/ 851' FWL	

Survey Report

Company:	Extraction Oil & Gas	Local Co-ordinate Reference:	Well Livingston S20-25-4N
Project:	Weld County, CO (NAD83)	TVD Reference:	KB @ 5359.30usft (Patterson 901)
Site:	Sec 07-T01S-R68W Livingston Pad	MD Reference:	KB @ 5359.30usft (Patterson 901)
Well:	Livingston S20-25-4N	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: _____