

# **Extraction Oil & Gas**

**Weld County, CO (NAD83)**

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

**Livingston S19-25-09N**

**Wellbore #1**

**Design: Wellbore #1**

## **Standard Survey Report**

**02 October, 2019**

## Survey Report

<b>Company:</b>	Extraction Oil & Gas	<b>Local Co-ordinate Reference:</b>	Well Livingston S19-25-09N
<b>Project:</b>	Weld County, CO (NAD83)	<b>TVD Reference:</b>	KB @ 5351.00usft (Patterson 901)
<b>Site:</b>	Sec 07-T01S-R68W Livingston Pad	<b>MD Reference:</b>	KB @ 5351.00usft (Patterson 901)
<b>Well:</b>	Livingston S19-25-09N	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<b>Database:</b>	EDM 5000.15 Single User Db

<b>Project</b>	Weld County, CO (NAD83),		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Ground Level
<b>Geo Datum:</b>	North American Datum 1983		
<b>Map Zone:</b>	Colorado Northern Zone		

Site		Sec 07-T01S-R68W Livingston Pad						
Site Position:		Northing:	1,238,290.24	usft	Latitude:	39.986624		
From:	Lat/Long	Easting:	3,125,301.58	usft	Longitude:	-105.052826		
Position Uncertainty:	0.00	usft	Slot Radius:	13-3/16	"	Grid Convergence:	0.29	°

Well	Livingston S19-25-09N					
Well Position	+N/-S	0.00 usft	Northing:	1,235,372.44 usft	Latitude:	39.978562
	+E/-W	0.00 usft	Easting:	3,129,020.44 usft	Longitude:	-105.039608
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	5,322.00 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	6/28/2019	8.10	66.42	51,868.58684754

<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	183.59	

<b>Survey Program</b>	<b>Date</b>	10/2/2019			
<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	
1,669.00	20,835.00	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	0.79	85.37	143.00	0.08	0.98	-0.14	0.55	0.55	0.00	
230.00	0.79	71.39	229.99	0.32	2.15	-0.45	0.22	0.00	-16.07	
318.00	0.18	151.28	317.98	0.39	2.79	-0.57	0.89	-0.69	90.78	
405.00	0.40	167.02	404.98	-0.02	2.92	-0.16	0.27	0.25	18.09	
492.00	0.66	148.47	491.98	-0.75	3.25	0.54	0.35	0.30	-21.32	
579.00	0.79	166.23	578.97	-1.76	3.66	1.52	0.30	0.15	20.41	
667.00	0.70	206.92	666.97	-2.83	3.56	2.60	0.60	-0.10	46.24	
754.00	1.05	271.08	753.96	-3.28	2.52	3.12	1.12	0.40	73.75	
841.00	1.58	278.11	840.93	-3.10	0.54	3.06	0.64	0.61	8.08	

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<b>Project:</b>	Weld County, CO (NAD83)	<b>TVD Reference:</b>	KB @ 5351.00usft (Patterson 901)
<b>Site:</b>	Sec 07-T01S-R68W Livingston Pad	<b>MD Reference:</b>	KB @ 5351.00usft (Patterson 901)
<b>Well:</b>	Livingston S19-25-09N	<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	1.80	297.71	928.90	-2.29	-1.89	2.40	0.70	0.25	22.27
1,016.00	1.93	318.01	1,015.85	-0.56	-4.08	0.82	0.77	0.15	23.33
1,103.00	4.00	312.56	1,102.73	2.58	-7.29	-2.12	2.40	2.38	-6.26
1,190.00	6.50	313.00	1,189.36	7.99	-13.13	-7.15	2.87	2.87	0.51
1,278.00	7.87	312.65	1,276.67	15.47	-21.20	-14.11	1.56	1.56	-0.40
1,365.00	8.57	311.33	1,362.77	23.79	-30.45	-21.84	0.83	0.80	-1.52
1,452.00	8.79	312.04	1,448.77	32.52	-40.26	-29.94	0.28	0.25	0.82
1,539.00	8.75	316.96	1,534.76	41.81	-49.71	-38.62	0.86	-0.05	5.66
1,592.00	8.53	318.54	1,587.16	47.70	-55.06	-44.16	0.61	-0.42	2.98
Tie into Surface Surveys									
1,669.00	8.57	320.41	1,663.30	56.40	-62.50	-52.38	0.36	0.05	2.43
First MWD Survey @ 1669' MD									
1,764.00	8.53	320.89	1,757.25	67.32	-71.46	-62.72	0.09	-0.04	0.51
1,860.00	8.57	321.46	1,852.18	78.44	-80.40	-73.26	0.10	0.04	0.59
1,973.00	10.43	315.87	1,963.63	92.37	-92.77	-86.39	1.84	1.65	-4.95
2,068.00	9.94	316.26	2,057.13	104.47	-104.43	-97.73	0.52	-0.52	0.41
2,163.00	8.97	312.12	2,150.84	115.36	-115.59	-107.90	1.25	-1.02	-4.36
2,257.00	10.87	316.97	2,243.43	126.75	-127.08	-118.56	2.21	2.02	5.16
2,351.00	10.38	316.66	2,335.82	139.39	-138.94	-130.43	0.52	-0.52	-0.33
2,446.00	9.63	316.13	2,429.37	151.34	-150.32	-141.64	0.80	-0.79	-0.56
2,541.00	9.32	315.38	2,523.08	162.55	-161.23	-152.14	0.35	-0.33	-0.79
2,636.00	10.56	309.21	2,616.65	173.53	-173.38	-162.34	1.72	1.31	-6.49
2,732.00	10.21	307.10	2,711.08	184.22	-186.98	-172.16	0.54	-0.36	-2.20
2,826.00	8.97	304.32	2,803.76	193.38	-199.68	-180.51	1.41	-1.32	-2.96
2,920.00	10.61	300.22	2,896.39	201.87	-213.21	-188.13	1.89	1.74	-4.36
3,016.00	10.43	299.03	2,990.78	210.53	-228.44	-195.83	0.29	-0.19	-1.24
3,111.00	9.59	295.60	3,084.33	218.12	-243.10	-202.49	1.08	-0.88	-3.61
3,206.00	8.88	303.57	3,178.11	225.60	-256.35	-209.12	1.54	-0.75	8.39
3,301.00	10.30	312.34	3,271.78	235.37	-268.73	-218.10	2.14	1.49	9.23
3,396.00	9.15	311.02	3,365.41	246.05	-280.71	-228.01	1.23	-1.21	-1.39
3,492.00	11.80	317.76	3,459.81	258.33	-293.07	-239.49	3.04	2.76	7.02
3,587.00	10.91	317.28	3,552.95	272.13	-305.70	-252.47	0.94	-0.94	-0.51
3,682.00	9.72	316.31	3,646.41	284.53	-317.34	-264.12	1.27	-1.25	-1.02
3,778.00	8.48	315.91	3,741.20	295.48	-327.86	-274.39	1.29	-1.29	-0.42
3,874.00	7.16	314.10	3,836.31	304.72	-337.09	-283.04	1.40	-1.38	-1.89
3,968.00	8.71	321.33	3,929.41	314.36	-345.74	-292.12	1.96	1.65	7.69
4,063.00	12.33	322.04	4,022.79	327.98	-356.48	-305.04	3.81	3.81	0.75
4,159.00	10.96	323.53	4,116.82	343.40	-368.21	-319.69	1.46	-1.43	1.55
4,254.00	9.10	321.29	4,210.36	356.52	-378.27	-332.16	2.00	-1.96	-2.36
4,349.00	7.42	318.82	4,304.37	367.00	-387.01	-342.08	1.81	-1.77	-2.60
4,444.00	9.90	309.79	4,398.29	376.85	-397.33	-351.26	2.97	2.61	-9.51
4,540.00	9.50	308.77	4,492.91	387.09	-409.85	-360.70	0.45	-0.42	-1.06
4,635.00	8.04	308.11	4,586.80	396.10	-421.19	-368.98	1.54	-1.54	-0.69

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<b>Well:</b>	Livingston S19-25-09N	<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)	
4,731.00	10.69	311.24	4,681.51	406.11	-433.17	-378.22	2.81	2.76	3.26	
4,826.00	10.12	312.03	4,774.95	417.51	-445.99	-388.80	0.62	-0.60	0.83	
4,922.00	8.93	308.77	4,869.63	427.82	-458.07	-398.33	1.36	-1.24	-3.40	
5,017.00	7.47	307.23	4,963.65	436.18	-468.73	-406.00	1.55	-1.54	-1.62	
5,113.00	10.47	316.26	5,058.47	446.26	-479.73	-415.38	3.44	3.13	9.41	
5,208.00	9.32	316.79	5,152.06	458.10	-490.97	-426.49	1.21	-1.21	0.56	
5,302.00	11.49	313.97	5,244.51	470.15	-502.92	-437.77	2.37	2.31	-3.00	
5,398.00	9.99	313.44	5,338.82	482.52	-515.85	-449.30	1.57	-1.56	-0.55	
5,493.00	8.26	313.66	5,432.62	492.89	-526.77	-458.98	1.82	-1.82	0.23	
5,589.00	10.65	321.46	5,527.31	504.59	-537.29	-470.00	2.82	2.49	8.13	
5,684.00	9.59	323.31	5,620.83	517.81	-547.49	-482.55	1.17	-1.12	1.95	
5,780.00	8.18	320.32	5,715.68	529.48	-556.62	-493.62	1.55	-1.47	-3.11	
5,875.00	11.31	307.41	5,809.31	540.34	-568.34	-503.73	4.00	3.29	-13.59	
5,971.00	9.72	298.81	5,903.70	549.97	-582.92	-512.43	2.32	-1.66	-8.96	
6,067.00	7.91	290.13	5,998.56	556.15	-596.23	-517.76	2.33	-1.89	-9.04	
6,162.00	11.09	306.52	6,092.26	563.84	-609.71	-524.59	4.36	3.35	17.25	
6,258.00	10.21	301.81	6,186.61	573.82	-624.37	-533.64	1.29	-0.92	-4.91	
6,353.00	8.57	296.83	6,280.34	581.45	-637.84	-540.41	1.93	-1.73	-5.24	
6,447.00	9.19	300.75	6,373.21	588.45	-650.54	-546.60	0.92	0.66	4.17	
6,543.00	9.81	299.52	6,467.89	596.40	-664.24	-553.68	0.68	0.65	-1.28	
6,638.00	9.85	311.55	6,561.51	605.78	-677.37	-562.22	2.16	0.04	12.66	
6,733.00	10.52	326.75	6,655.03	618.42	-688.21	-574.16	2.91	0.71	16.00	
6,828.00	9.32	324.72	6,748.61	631.95	-697.41	-587.09	1.32	-1.26	-2.14	
6,923.00	8.22	322.17	6,842.49	643.60	-706.01	-598.18	1.23	-1.16	-2.68	
7,019.00	6.89	316.53	6,937.66	653.20	-714.19	-607.25	1.58	-1.39	-5.88	
7,114.00	5.57	314.15	7,032.10	660.55	-721.41	-614.13	1.42	-1.39	-2.51	
7,209.00	1.68	352.49	7,126.90	665.14	-724.91	-618.49	4.61	-4.09	40.36	
7,305.00	1.33	289.25	7,222.87	666.90	-726.14	-620.18	1.67	-0.36	-65.88	
7,400.00	0.97	288.59	7,317.85	667.52	-727.94	-620.68	0.38	-0.38	-0.69	
7,496.00	3.40	215.53	7,413.79	665.46	-730.37	-618.48	3.39	2.53	-76.10	
7,591.00	15.42	182.08	7,507.38	650.49	-732.47	-603.40	13.39	12.65	-35.21	
7,686.00	25.98	182.25	7,596.12	616.98	-733.75	-569.87	11.12	11.12	0.18	
7,761.82	30.00	181.75	7,663.06	581.43	-734.99	-534.31	5.31	5.30	-0.66	
30° Inclination @ 7761.82' MD										
7,782.00	31.07	181.64	7,680.44	571.18	-735.29	-524.07	5.31	5.30	-0.56	
7,877.00	38.89	178.16	7,758.22	516.78	-735.03	-469.79	8.49	8.23	-3.66	
7,973.00	47.86	180.49	7,827.94	450.93	-734.37	-404.11	9.49	9.34	2.43	
8,068.00	56.39	180.40	7,886.21	376.01	-734.95	-329.30	8.98	8.98	-0.09	
8,163.00	67.34	179.39	7,930.94	292.36	-734.75	-245.83	11.56	11.53	-1.06	
8,192.45	70.00	179.60	7,941.65	264.94	-734.51	-218.47	9.05	9.03	0.71	
70° Inclination @ 8192.45' MD										
8,259.00	76.01	180.05	7,961.09	201.32	-734.32	-154.99	9.05	9.03	0.68	
8,354.00	83.78	179.21	7,977.75	107.87	-733.71	-61.76	8.23	8.18	-0.88	
8,449.00	87.89	178.20	7,984.65	13.17	-731.57	32.62	4.45	4.33	-1.06	

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<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
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Survey										
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8,545.00	88.56	176.88	7,987.62	-82.70	-727.45	128.04	1.54	0.70	-1.38	
8,640.00	88.73	176.39	7,989.87	-177.51	-721.88	222.31	0.55	0.18	-0.52	
8,756.00	89.17	176.44	7,991.99	-293.26	-714.62	337.39	0.38	0.38	0.04	
8,852.00	88.82	177.10	7,993.68	-389.09	-709.21	432.69	0.78	-0.36	0.69	
8,947.00	88.47	178.07	7,995.92	-483.98	-705.21	527.14	1.09	-0.37	1.02	
9,042.00	88.29	179.48	7,998.61	-578.92	-703.18	621.77	1.50	-0.19	1.48	
9,137.00	88.64	180.62	8,001.15	-673.88	-703.27	716.55	1.25	0.37	1.20	
9,233.00	89.31	181.64	8,002.87	-769.85	-705.16	812.45	1.27	0.70	1.06	
9,328.00	89.70	182.17	8,003.69	-864.79	-708.32	907.40	0.69	0.41	0.56	
9,423.00	89.88	183.05	8,004.04	-959.69	-712.64	1,002.39	0.95	0.19	0.93	
9,518.00	90.28	183.71	8,003.91	-1,054.52	-718.24	1,097.38	0.81	0.42	0.69	
9,613.00	90.28	184.02	8,003.44	-1,149.31	-724.65	1,192.38	0.33	0.00	0.33	
9,708.00	90.77	183.53	8,002.57	-1,244.09	-730.90	1,287.38	0.73	0.52	-0.52	
9,802.00	91.03	183.09	8,001.10	-1,337.93	-736.33	1,381.36	0.54	0.28	-0.47	
9,898.00	91.03	182.25	7,999.37	-1,433.81	-740.80	1,477.34	0.87	0.00	-0.88	
9,993.00	90.99	181.55	7,997.70	-1,528.74	-743.95	1,572.28	0.74	-0.04	-0.74	
10,088.00	90.99	180.62	7,996.05	-1,623.71	-745.75	1,667.17	0.98	0.00	-0.98	
10,183.00	90.54	180.93	7,994.79	-1,718.69	-747.03	1,762.05	0.58	-0.47	0.33	
10,279.00	90.72	180.54	7,993.73	-1,814.67	-748.26	1,857.93	0.45	0.19	-0.41	
10,374.00	90.50	180.01	7,992.72	-1,909.67	-748.72	1,952.76	0.60	-0.23	-0.56	
10,469.00	90.37	179.57	7,992.00	-2,004.66	-748.37	2,047.55	0.48	-0.14	-0.46	
10,564.00	90.01	179.79	7,991.68	-2,099.66	-747.84	2,142.33	0.44	-0.38	0.23	
10,659.00	90.15	179.92	7,991.55	-2,194.66	-747.60	2,237.13	0.20	0.15	0.14	
10,755.00	90.19	180.05	7,991.27	-2,290.66	-747.57	2,332.94	0.14	0.04	0.14	
10,796.34	90.13	180.05	7,991.15	-2,332.00	-747.61	2,374.20	0.14	-0.14	0.00	
<b>Cross @ 10796.34' MD</b>										
10,849.00	90.06	180.05	7,991.06	-2,384.66	-747.66	2,426.76	0.14	-0.14	0.00	
10,945.00	89.97	180.23	7,991.04	-2,480.66	-747.89	2,522.58	0.21	-0.09	0.19	
11,040.00	89.93	180.32	7,991.12	-2,575.66	-748.35	2,617.43	0.10	-0.04	0.09	
11,135.00	89.31	180.80	7,991.75	-2,670.65	-749.28	2,712.29	0.83	-0.65	0.51	
11,231.00	89.31	181.11	7,992.90	-2,766.63	-750.88	2,808.18	0.32	0.00	0.32	
11,326.00	89.40	181.11	7,993.97	-2,861.61	-752.72	2,903.09	0.09	0.09	0.00	
11,421.00	89.22	181.64	7,995.12	-2,956.57	-755.00	2,998.01	0.59	-0.19	0.56	
11,516.00	89.22	181.90	7,996.41	-3,051.52	-757.93	3,092.95	0.27	0.00	0.27	
11,611.00	89.70	181.51	7,997.31	-3,146.47	-760.76	3,187.90	0.65	0.51	-0.41	
11,707.00	89.66	181.37	7,997.84	-3,242.44	-763.17	3,283.83	0.15	-0.04	-0.15	
11,802.00	89.62	181.42	7,998.44	-3,337.41	-765.48	3,378.76	0.07	-0.04	0.05	
11,897.00	89.75	181.28	7,998.96	-3,432.38	-767.72	3,473.68	0.20	0.14	-0.15	
11,993.00	90.06	180.36	7,999.12	-3,528.37	-769.09	3,569.57	1.01	0.32	-0.96	
12,088.00	90.23	179.87	7,998.88	-3,623.37	-769.28	3,664.39	0.55	0.18	-0.52	
12,184.00	90.01	179.48	7,998.68	-3,719.37	-768.74	3,760.17	0.47	-0.23	-0.41	
12,279.00	90.10	178.29	7,998.59	-3,814.35	-766.89	3,854.85	1.26	0.09	-1.25	
12,375.00	89.93	177.50	7,998.56	-3,910.28	-763.36	3,950.37	0.84	-0.18	-0.82	

# Survey Report

<b>Company:</b>	Extraction Oil & Gas	<b>Local Co-ordinate Reference:</b>	Well Livingston S19-25-09N
<b>Project:</b>	Weld County, CO (NAD83)	<b>TVD Reference:</b>	KB @ 5351.00usft (Patterson 901)
<b>Site:</b>	Sec 07-T01S-R68W Livingston Pad	<b>MD Reference:</b>	KB @ 5351.00usft (Patterson 901)
<b>Well:</b>	Livingston S19-25-09N	<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)
12,470.00	89.35	177.27	7,999.16	-4,005.18	-759.03	4,044.82	0.66	-0.61	-0.24
12,566.00	89.00	177.14	8,000.54	-4,101.06	-754.35	4,140.21	0.39	-0.36	-0.14
12,661.00	88.33	177.72	8,002.76	-4,195.94	-750.09	4,234.64	0.93	-0.71	0.61
12,757.00	88.25	178.29	8,005.62	-4,291.83	-746.75	4,330.14	0.60	-0.08	0.59
12,852.00	88.47	178.60	8,008.34	-4,386.76	-744.17	4,424.72	0.40	0.23	0.33
12,948.00	88.47	179.35	8,010.90	-4,482.71	-742.46	4,520.37	0.78	0.00	0.78
13,043.00	88.95	179.65	8,013.04	-4,577.68	-741.63	4,615.11	0.60	0.51	0.32
13,138.00	89.62	179.08	8,014.23	-4,672.67	-740.58	4,709.84	0.93	0.71	-0.60
13,234.00	89.70	178.99	8,014.80	-4,768.65	-738.96	4,805.54	0.13	0.08	-0.09
13,330.00	90.01	178.38	8,015.04	-4,864.63	-736.76	4,901.18	0.71	0.32	-0.64
13,425.00	89.79	178.55	8,015.20	-4,959.59	-734.21	4,995.80	0.29	-0.23	0.18
13,521.00	89.70	177.98	8,015.63	-5,055.55	-731.30	5,091.39	0.60	-0.09	-0.59
13,616.00	89.84	177.45	8,016.01	-5,150.47	-727.52	5,185.89	0.58	0.15	-0.56
13,711.00	89.31	178.38	8,016.72	-5,245.40	-724.06	5,280.42	1.13	-0.56	0.98
13,807.00	89.13	179.35	8,018.03	-5,341.37	-722.16	5,376.09	1.03	-0.19	1.01
13,902.00	89.70	180.05	8,019.00	-5,436.37	-721.66	5,470.86	0.95	0.60	0.74
13,997.00	89.97	180.71	8,019.27	-5,531.36	-722.29	5,565.71	0.75	0.28	0.69
14,092.00	89.93	181.06	8,019.35	-5,626.35	-723.76	5,660.61	0.37	-0.04	0.37
14,187.00	90.01	181.37	8,019.40	-5,721.33	-725.77	5,755.52	0.34	0.08	0.33
14,282.00	90.06	181.37	8,019.34	-5,816.30	-728.04	5,850.45	0.05	0.05	0.00
14,377.00	90.28	181.37	8,019.06	-5,911.28	-730.32	5,945.38	0.23	0.23	0.00
14,472.00	90.37	180.62	8,018.52	-6,006.26	-731.97	6,040.28	0.80	0.09	-0.79
14,567.00	90.15	180.98	8,018.09	-6,101.25	-733.29	6,135.17	0.44	-0.23	0.38
14,663.00	90.54	180.71	8,017.51	-6,197.24	-734.71	6,231.06	0.49	0.41	-0.28
14,758.00	90.37	180.40	8,016.76	-6,292.23	-735.63	6,325.92	0.37	-0.18	-0.33
14,853.00	89.97	179.96	8,016.48	-6,387.23	-735.93	6,420.75	0.63	-0.42	-0.46
14,948.00	89.70	180.27	8,016.75	-6,482.23	-736.12	6,515.58	0.43	-0.28	0.33
15,043.00	89.70	180.54	8,017.25	-6,577.22	-736.79	6,610.43	0.28	0.00	0.28
15,138.00	89.66	180.54	8,017.78	-6,672.22	-737.68	6,705.29	0.04	-0.04	0.00
15,233.00	89.79	180.40	8,018.23	-6,767.21	-738.46	6,800.15	0.20	0.14	-0.15
15,327.00	89.35	181.11	8,018.94	-6,861.20	-739.70	6,894.03	0.89	-0.47	0.76
15,422.00	89.44	181.20	8,019.94	-6,956.18	-741.62	6,988.94	0.13	0.09	0.09
15,518.00	89.53	181.64	8,020.81	-7,052.14	-744.00	7,084.87	0.47	0.09	0.46
15,613.00	89.22	181.95	8,021.84	-7,147.09	-746.97	7,179.82	0.46	-0.33	0.33
15,708.00	89.00	182.65	8,023.32	-7,242.00	-750.78	7,274.78	0.77	-0.23	0.74
15,803.00	89.26	182.17	8,024.76	-7,336.91	-754.78	7,369.75	0.57	0.27	-0.51
15,899.00	88.91	182.52	8,026.29	-7,432.81	-758.70	7,465.72	0.52	-0.36	0.36
15,994.00	89.17	182.30	8,027.89	-7,527.72	-762.70	7,560.68	0.36	0.27	-0.23
16,066.34	89.21	182.06	8,028.91	-7,600.00	-765.45	7,632.99	0.33	0.05	-0.33
<b>Cross @ 16066.34' MD</b>									
16,089.00	89.22	181.99	8,029.22	-7,622.64	-766.25	7,655.64	0.33	0.05	-0.33
16,184.00	89.22	181.99	8,030.51	-7,717.57	-769.55	7,750.60	0.00	0.00	0.00
16,278.00	89.35	182.12	8,031.69	-7,811.51	-772.92	7,844.56	0.20	0.14	0.14
16,373.00	89.26	181.81	8,032.84	-7,906.44	-776.18	7,939.51	0.34	-0.09	-0.33

## Survey Report

<b>Company:</b>	Extraction Oil & Gas	<b>Local Co-ordinate Reference:</b>	Well Livingston S19-25-09N
<b>Project:</b>	Weld County, CO (NAD83)	<b>TVD Reference:</b>	KB @ 5351.00usft (Patterson 901)
<b>Site:</b>	Sec 07-T01S-R68W Livingston Pad	<b>MD Reference:</b>	KB @ 5351.00usft (Patterson 901)
<b>Well:</b>	Livingston S19-25-09N	<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)
16,469.00	89.48	181.02	8,033.89	-8,002.41	-778.55	8,035.44	0.85	0.23	-0.82
16,563.00	89.75	180.32	8,034.53	-8,096.40	-779.65	8,129.31	0.80	0.29	-0.74
16,659.00	89.84	179.65	8,034.87	-8,192.40	-779.62	8,225.12	0.70	0.09	-0.70
16,755.00	89.48	179.30	8,035.44	-8,288.39	-778.75	8,320.87	0.52	-0.38	-0.36
16,850.00	89.44	178.20	8,036.33	-8,383.36	-776.67	8,415.53	1.16	-0.04	-1.16
16,945.00	88.91	177.63	8,037.70	-8,478.29	-773.22	8,510.05	0.82	-0.56	-0.60
17,041.00	88.69	177.27	8,039.71	-8,574.17	-768.95	8,605.48	0.44	-0.23	-0.38
17,136.00	88.86	176.88	8,041.74	-8,669.03	-764.10	8,699.85	0.45	0.18	-0.41
17,231.00	88.82	176.35	8,043.67	-8,763.84	-758.49	8,794.12	0.56	-0.04	-0.56
17,325.00	88.56	176.44	8,045.82	-8,857.63	-752.58	8,887.36	0.29	-0.28	0.10
17,420.00	88.03	177.72	8,048.64	-8,952.46	-747.75	8,981.70	1.46	-0.56	1.35
17,515.00	88.16	178.02	8,051.80	-9,047.34	-744.22	9,076.18	0.34	0.14	0.32
17,611.00	87.80	179.43	8,055.18	-9,143.26	-742.08	9,171.77	1.51	-0.38	1.47
17,706.00	87.94	180.18	8,058.72	-9,238.19	-741.76	9,266.50	0.80	0.15	0.79
17,801.00	88.11	180.76	8,061.99	-9,333.13	-742.54	9,361.30	0.64	0.18	0.61
17,897.00	88.56	180.98	8,064.78	-9,429.08	-744.00	9,457.15	0.52	0.47	0.23
17,992.00	88.64	181.20	8,067.10	-9,524.03	-745.80	9,552.03	0.25	0.08	0.23
18,088.00	88.42	182.39	8,069.56	-9,619.95	-748.81	9,647.95	1.26	-0.23	1.24
18,183.00	89.17	182.25	8,071.56	-9,714.85	-752.65	9,742.91	0.80	0.79	-0.15
18,278.00	88.95	182.56	8,073.12	-9,809.76	-756.64	9,837.88	0.40	-0.23	0.33
18,374.00	88.82	183.31	8,074.99	-9,905.61	-761.55	9,933.85	0.79	-0.14	0.78
18,469.00	89.48	182.87	8,076.40	-10,000.46	-766.67	10,028.84	0.83	0.69	-0.46
18,565.00	89.17	182.74	8,077.53	-10,096.34	-771.37	10,124.82	0.35	-0.32	-0.14
18,661.00	89.09	182.74	8,078.98	-10,192.22	-775.96	10,220.80	0.08	-0.08	0.00
18,756.00	89.22	182.92	8,080.39	-10,287.09	-780.65	10,315.78	0.23	0.14	0.19
18,852.00	89.26	182.65	8,081.66	-10,382.97	-785.31	10,411.76	0.28	0.04	-0.28
18,947.00	89.13	182.78	8,082.99	-10,477.86	-789.81	10,506.74	0.19	-0.14	0.14
19,043.00	89.31	182.34	8,084.30	-10,573.75	-794.10	10,602.72	0.50	0.19	-0.46
19,138.00	89.48	181.77	8,085.30	-10,668.68	-797.51	10,697.68	0.63	0.18	-0.60
19,234.00	89.48	181.51	8,086.18	-10,764.64	-800.25	10,793.62	0.27	0.00	-0.27
19,329.00	89.40	181.20	8,087.10	-10,859.61	-802.50	10,888.54	0.34	-0.08	-0.33
19,425.00	89.62	180.49	8,087.92	-10,955.60	-803.92	10,984.43	0.77	0.23	-0.74
19,520.00	89.31	180.49	8,088.81	-11,050.59	-804.73	11,079.28	0.33	-0.33	0.00
19,615.00	89.31	180.18	8,089.96	-11,145.58	-805.28	11,174.13	0.33	0.00	-0.33
19,709.00	89.26	179.52	8,091.13	-11,239.57	-805.04	11,267.92	0.70	-0.05	-0.70
19,803.00	89.09	179.65	8,092.48	-11,333.56	-804.36	11,361.68	0.23	-0.18	0.14
19,898.00	89.75	179.43	8,093.44	-11,428.55	-803.59	11,456.44	0.73	0.69	-0.23
19,992.00	89.62	179.26	8,093.96	-11,522.54	-802.52	11,550.18	0.23	-0.14	-0.18
20,087.00	90.06	178.60	8,094.23	-11,617.53	-800.75	11,644.86	0.83	0.46	-0.69
20,182.00	90.23	178.95	8,093.99	-11,712.50	-798.71	11,739.53	0.41	0.18	0.37
20,277.00	90.15	178.82	8,093.67	-11,807.48	-796.87	11,834.21	0.16	-0.08	-0.14
20,372.00	90.19	178.77	8,093.39	-11,902.46	-794.87	11,928.88	0.07	0.04	-0.05
20,467.00	90.23	178.20	8,093.04	-11,997.43	-792.36	12,023.50	0.60	0.04	-0.60

## Survey Report

<b>Company:</b>	Extraction Oil & Gas	<b>Local Co-ordinate Reference:</b>	Well Livingston S19-25-09N
<b>Project:</b>	Weld County, CO (NAD83)	<b>TVD Reference:</b>	KB @ 5351.00usft (Patterson 901)
<b>Site:</b>	Sec 07-T01S-R68W Livingston Pad	<b>MD Reference:</b>	KB @ 5351.00usft (Patterson 901)
<b>Well:</b>	Livingston S19-25-09N	<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)
20,561.00	90.15	177.94	8,092.73	-12,091.37	-789.19	12,117.06	0.29	-0.09	-0.28
20,656.00	90.50	177.01	8,092.19	-12,186.28	-785.01	12,211.52	1.05	0.37	-0.98
20,751.00	90.54	176.70	8,091.33	-12,281.13	-779.79	12,305.86	0.33	0.04	-0.33
20,806.00	90.54	176.70	8,090.81	-12,336.04	-776.63	12,360.46	0.00	0.00	0.00
Last MWD Survey @ 20806' MD									
20,835.00	90.54	176.70	8,090.54	-12,364.99	-774.96	12,389.25	0.00	0.00	0.00
Projection to TD @ 20835' MD 510' FSL/ 2233' FEL									

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
30° Inclination @ 7761.8	0.00	0.00	7,663.06	581.43	-734.99	1,235,950.04	3,128,282.44	39.980158	-105.042231
- actual wellpath misses target center by 0.01usft at 7761.82usft MD (7663.06 TVD, 581.43 N, -734.99 E)									
- Point									
70° Inclination @ 8192.4	0.00	0.00	7,941.65	264.93	-734.51	1,235,633.55	3,128,284.56	39.979289	-105.042229
- actual wellpath hits target center									
- Point									
Cross @ 10796.34' MD	0.00	0.00	7,991.15	-2,332.00	-747.61	1,233,036.59	3,128,284.94	39.972160	-105.042276
- actual wellpath hits target center									
- Point									
Cross @ 16066.34' MD	0.00	0.00	8,028.91	-7,600.00	-765.45	1,227,768.56	3,128,294.45	39.957698	-105.042339
- actual wellpath hits target center									
- Point									

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
1,592.00	1,587.16	47.70	-55.06	Tie into Surface Surveys
1,669.00	1,663.30	56.40	-62.50	First MWD Survey @ 1669' MD
7,761.82	7,663.06	581.43	-734.99	30° Inclination @ 7761.82' MD
8,192.45	7,941.65	264.94	-734.51	70° Inclination @ 8192.45' MD
10,796.34	7,991.15	-2,332.00	-747.61	Cross @ 10796.34' MD
16,066.34	8,028.91	-7,600.00	-765.45	Cross @ 16066.34' MD
20,806.00	8,090.81	-12,336.04	-776.63	Last MWD Survey @ 20806' MD
20,835.00	8,090.54	-12,364.99	-774.96	Projection to TD @ 20835' MD 510' FSL/ 2233' FEL

Checked By: _____	Approved By: _____	Date: _____
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