

# **EXTRACTION OIL & GAS**

**Broomfield County**

**Sec 7-T1S-R68W**

**LIVINGSTON S19-25-5C**

**ORIGINAL WELLBORE**

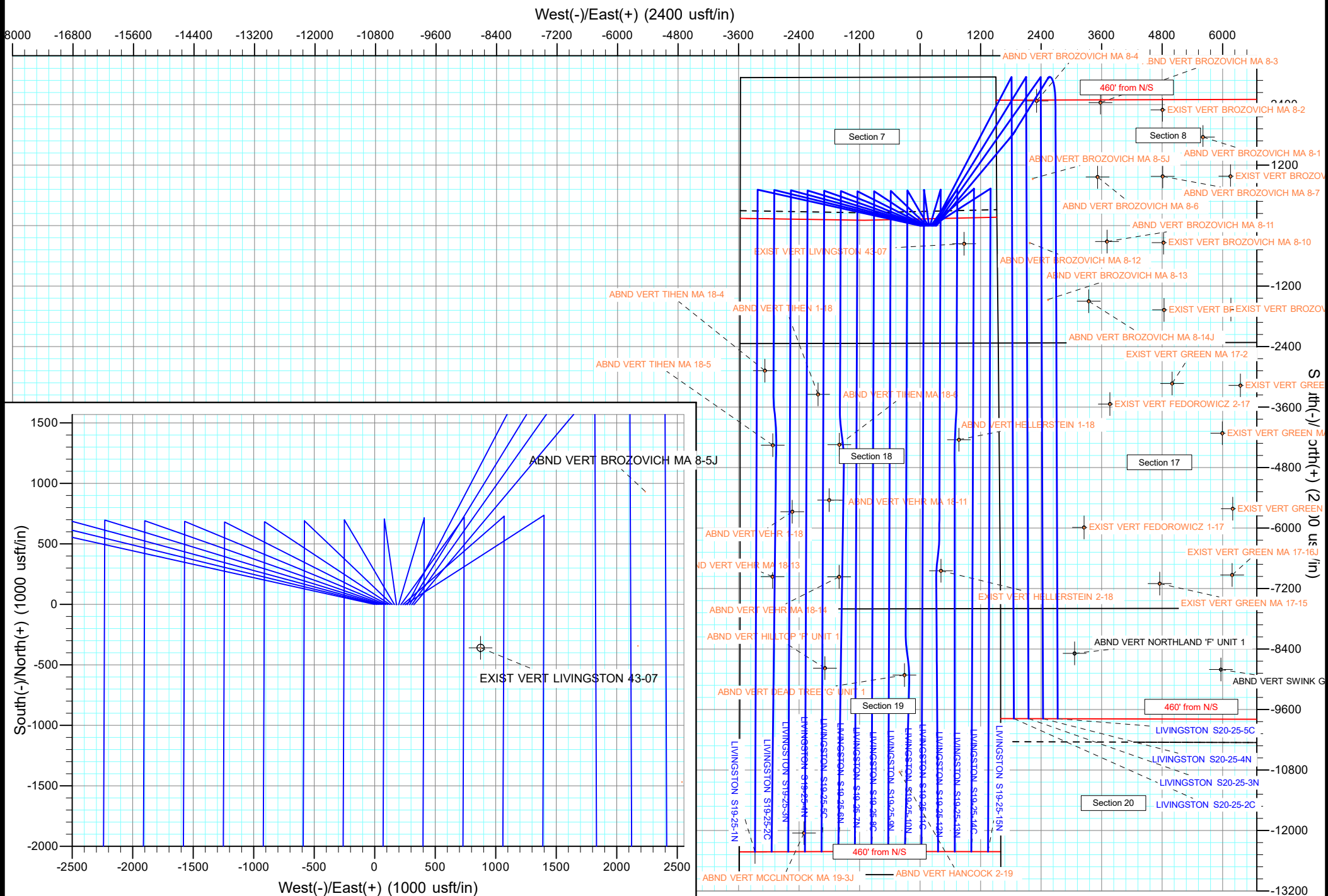
**PROPOSAL 1**

## **Anticollision Report**

**11 January, 2018**



Project: Broomfield County  
Site: Sec 7-T1S-R68W  
Well: LIVINGSTON S19-25-1N  
ORIGINAL WELLBORE  
PROPOSAL 1



# Anticollision Report

<b>Company:</b>	EXTRACTION OIL & GAS	<b>Local Co-ordinate Reference:</b>	Well LIVINGSTON S19-25-5C
<b>Project:</b>	Broomfield County	<b>TVD Reference:</b>	KB 25' @ 5336.00usft
<b>Reference Site:</b>	Sec 7-T1S-R68W	<b>MD Reference:</b>	KB 25' @ 5336.00usft
<b>Site Error:</b>	0.00 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	LIVINGSTON S19-25-5C	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	ORIGINAL WELLBORE	<b>Database:</b>	EDT_32Bit_ODBC
<b>Reference Design:</b>	PROPOSAL 1	<b>Offset TVD Reference:</b>	Offset Datum

<b>Reference</b>	PROPOSAL 1		
<b>Filter type:</b>	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
<b>Interpolation Method:</b>	MD + Stations Interval 100.00usft	<b>Error Model:</b>	ISCWSA
<b>Depth Range:</b>	Unlimited	<b>Scan Method:</b>	Closest Approach 3D
<b>Results Limited by:</b>	Maximum center-center distance of 9,999.98 usft	<b>Error Surface:</b>	Pedal Curve
<b>Warning Levels Evaluated at:</b>	2.00 Sigma	<b>Casing Method:</b>	Not applied

<b>Survey Tool Program</b>	<b>Date</b>	1/11/2018		
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>
0.00	21,488.72	PROPOSAL 1 (ORIGINAL WELLBORE)	MWD OWSG	OWSG MWD - Standard

<b>Summary</b>						
Site Name	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
Sec 18-T1S-R68W						
ABND VERT HELLERSTEIN 1-18 - Wellbore #1 - Design	13,306.42	8,366.00	2,692.31	2,438.72	10.617	CC, ES
ABND VERT HELLERSTEIN 1-18 - Wellbore #1 - Design	13,500.00	8,366.00	2,699.26	2,444.05	10.577	SF
ABND VERT TIHEN 1-18 - Wellbore #1 - Design #1	12,417.68	8,328.00	105.93	-132.68	0.444	Level 1, CC, ES, SF
ABND VERT TIHEN MA 18-4 - Wellbore #1 - Design #1	11,951.84	8,261.00	1,161.57	931.49	5.048	CC
ABND VERT TIHEN MA 18-4 - Wellbore #1 - Design #1	12,000.00	8,261.00	1,162.57	931.10	5.022	ES
ABND VERT TIHEN MA 18-4 - Wellbore #1 - Design #1	12,100.00	8,261.00	1,170.99	936.81	5.001	SF
ABND VERT TIHEN MA 18-5 - Wellbore #1 - Design #1	13,430.17	8,307.00	998.93	744.50	3.926	CC, ES
ABND VERT TIHEN MA 18-5 - Wellbore #1 - Design #1	13,500.00	8,307.00	1,001.37	744.63	3.900	SF
ABND VERT TIHEN MA 18-6 - Wellbore #1 - Design #1	13,400.00	8,359.00	321.49	65.74	1.257	Level 3, ES, SF
ABND VERT TIHEN MA 18-6 - Wellbore #1 - Design #1	13,414.13	8,359.00	321.18	65.97	1.259	Level 3, CC
ABND VERT VEHR 1-18 - Wellbore #1 - Design #1	14,747.34	8,329.00	607.04	467.73	4.357	CC
ABND VERT VEHR 1-18 - Wellbore #1 - Design #1	14,800.00	8,329.00	609.32	467.72	4.303	ES, SF
ABND VERT VEHR MA 18-11 - Wellbore #1 - Design #1	14,500.00	8,352.00	124.57	-150.29	0.453	Level 1, ES
ABND VERT VEHR MA 18-11 - Wellbore #1 - Design #1	14,515.02	8,352.00	123.66	-149.68	0.452	Level 1, CC, SF
ABND VERT VEHR MA 18-13 - Wellbore #1 - Design #1	16,038.37	8,384.00	994.51	833.06	6.160	CC
ABND VERT VEHR MA 18-13 - Wellbore #1 - Design #1	16,100.00	8,384.00	996.41	832.84	6.092	ES
ABND VERT VEHR MA 18-13 - Wellbore #1 - Design #1	16,200.00	8,384.00	1,007.55	841.54	6.069	SF
ABND VERT VEHR MA 18-14 - Wellbore #1 - Design #1	16,036.90	8,364.00	326.09	26.69	1.089	Level 2, CC, ES, SF
EXIST VERT HELLERSTEIN 2-18 - Wellbore #1 - Design	15,908.00	8,306.00	2,345.58	2,049.55	7.923	CC, ES
EXIST VERT HELLERSTEIN 2-18 - Wellbore #1 - Design	16,000.00	8,306.00	2,347.38	2,050.69	7.912	SF
Sec 19-T1S-R68W						
ABND VERT DEAD TREE 'G' UNIT 1 - Wellbore #1 - De	17,979.92	8,303.00	1,630.54	1,298.88	4.916	CC, ES
ABND VERT DEAD TREE 'G' UNIT 1 - Wellbore #1 - De	18,000.00	8,303.00	1,630.66	1,298.94	4.916	SF
ABND VERT HANCOCK 2-19 - Wellbore #1 - Design #1	19,896.37	8,272.99	1,539.98	1,175.61	4.226	CC
ABND VERT HANCOCK 2-19 - Wellbore #1 - Design #1	19,900.00	8,272.99	1,539.99	1,175.61	4.226	ES, SF
ABND VERT HILLTOP 'F' UNIT 1 - Wellbore #1 - Design	17,848.41	8,309.00	52.81	-276.68	0.160	Level 1, CC, ES, SF
ABND VERT MCCLINTOCK MA 19-3J - Wellbore #1 - De	21,121.16	8,301.99	349.43	-36.91	0.904	Level 1, CC, ES, SF

# Anticollision Report

<b>Company:</b>	EXTRACTION OIL & GAS	<b>Local Co-ordinate Reference:</b>	Well LIVINGSTON S19-25-5C
<b>Project:</b>	Broomfield County	<b>TVD Reference:</b>	KB 25' @ 5336.00usft
<b>Reference Site:</b>	Sec 7-T1S-R68W	<b>MD Reference:</b>	KB 25' @ 5336.00usft
<b>Site Error:</b>	0.00 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	LIVINGSTON S19-25-5C	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	ORIGINAL WELLBORE	<b>Database:</b>	EDT_32Bit_ODBC
<b>Reference Design:</b>	PROPOSAL 1	<b>Offset TVD Reference:</b>	Offset Datum

Summary						
Site Name	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
Sec 7-T1S-R68W						
EXIST VERT LIVINGSTON 43-07 - Wellbore #1 - Design	500.00	512.00	879.13	867.70	76.925	CC
EXIST VERT LIVINGSTON 43-07 - Wellbore #1 - Design	600.00	611.98	880.87	867.06	63.813	ES
EXIST VERT LIVINGSTON 43-07 - Wellbore #1 - Design	9,600.00	8,314.00	2,785.27	2,582.63	13.745	SF
LIVINGSTON S19-25-10N - ORIGINAL WELLBORE - PR	500.00	500.00	89.96	86.82	28.680	CC, ES
LIVINGSTON S19-25-10N - ORIGINAL WELLBORE - PR	21,488.81	20,984.79	1,668.82	1,222.23	3.737	SF
LIVINGSTON S19-25-11C - ORIGINAL WELLBORE - PR	500.00	500.00	107.90	104.76	34.399	CC, ES
LIVINGSTON S19-25-11C - ORIGINAL WELLBORE - PR	21,489.52	21,211.11	1,980.88	1,529.28	4.386	SF
LIVINGSTON S19-25-12N - ORIGINAL WELLBORE - PR	500.00	500.00	125.83	122.69	40.117	CC, ES
LIVINGSTON S19-25-12N - ORIGINAL WELLBORE - PR	21,489.52	20,978.12	2,323.99	1,875.23	5.179	SF
LIVINGSTON S19-25-13N - ORIGINAL WELLBORE - PR	500.00	500.00	144.05	140.91	45.924	CC, ES
LIVINGSTON S19-25-13N - ORIGINAL WELLBORE - PR	21,489.52	21,021.70	2,652.45	2,202.69	5.898	SF
LIVINGSTON S19-25-14C - ORIGINAL WELLBORE - PR	500.00	500.00	161.98	158.84	51.642	CC, ES
LIVINGSTON S19-25-14C - ORIGINAL WELLBORE - PR	21,488.81	21,317.96	2,971.47	2,519.52	6.575	SF
LIVINGSTON S19-25-15N - ORIGINAL WELLBORE - PR	500.00	500.00	179.92	176.78	57.361	CC, ES
LIVINGSTON S19-25-15N - ORIGINAL WELLBORE - PR	21,489.52	21,136.91	3,310.50	2,860.24	7.352	SF
LIVINGSTON S19-25-1N - ORIGINAL WELLBORE - PR	0.00	25.00	72.02			
LIVINGSTON S19-25-1N - ORIGINAL WELLBORE - PR	100.00	124.40	72.13	71.77	201.520	ES
LIVINGSTON S19-25-1N - ORIGINAL WELLBORE - PR	21,489.52	21,737.26	1,347.69	897.51	2.994	SF
LIVINGSTON S19-25-2C - ORIGINAL WELLBORE - PR	105.56	130.56	54.09	53.69	135.794	CC
LIVINGSTON S19-25-2C - ORIGINAL WELLBORE - PR	200.00	224.55	54.19	53.12	50.486	ES
LIVINGSTON S19-25-2C - ORIGINAL WELLBORE - PR	21,489.52	21,815.86	990.53	536.87	2.183	SF
LIVINGSTON S19-25-3N - ORIGINAL WELLBORE - PR	300.00	300.00	35.87	34.17	21.068	CC, ES
LIVINGSTON S19-25-3N - ORIGINAL WELLBORE - PR	21,489.52	21,475.51	703.93	266.69	1.610	SF
LIVINGSTON S19-25-4N - ORIGINAL WELLBORE - PR	400.00	400.00	17.94	15.52	7.412	CC, ES
LIVINGSTON S19-25-4N - ORIGINAL WELLBORE - PR	21,489.52	21,363.28	410.42	15.59	1.039	Level 2, SF
LIVINGSTON S19-25-6N - ORIGINAL WELLBORE - PR	500.00	500.00	17.94	14.80	5.718	CC, ES
LIVINGSTON S19-25-6N - ORIGINAL WELLBORE - PR	21,489.52	21,177.21	410.59	32.81	1.087	Level 2, SF
LIVINGSTON S19-25-7N - ORIGINAL WELLBORE - PR	500.00	500.00	35.87	32.74	11.437	CC, ES
LIVINGSTON S19-25-7N - ORIGINAL WELLBORE - PR	21,477.69	21,084.92	704.16	278.21	1.653	SF
LIVINGSTON S19-25-8C - ORIGINAL WELLBORE - PR	500.00	500.00	54.09	50.95	17.244	CC, ES
LIVINGSTON S19-25-8C - ORIGINAL WELLBORE - PR	21,479.76	21,275.65	990.79	538.81	2.192	SF
LIVINGSTON S19-25-9N - ORIGINAL WELLBORE - PR	500.00	500.00	72.02	68.89	22.962	CC, ES
LIVINGSTON S19-25-9N - ORIGINAL WELLBORE - PR	21,477.94	21,001.20	1,343.16	899.07	3.025	SF
LIVINGSTON S20-25-2C - ORIGINAL WELLBORE - PR	400.00	400.00	197.85	195.43	81.768	CC, ES
LIVINGSTON S20-25-2C - ORIGINAL WELLBORE - PR	19,100.00	21,633.46	3,811.66	3,431.34	10.022	SF
LIVINGSTON S20-25-3N - ORIGINAL WELLBORE - PR	300.00	300.00	216.07	214.37	126.895	CC, ES
LIVINGSTON S20-25-3N - ORIGINAL WELLBORE - PR	19,200.00	21,479.55	4,116.12	3,735.33	10.809	SF
LIVINGSTON S20-25-4N - ORIGINAL WELLBORE - PR	200.00	200.00	234.00	233.02	237.376	CC, ES
LIVINGSTON S20-25-4N - ORIGINAL WELLBORE - PR	19,300.00	21,546.10	4,414.16	4,032.14	11.555	SF
LIVINGSTON S20-25-5C - ORIGINAL WELLBORE - PR	100.00	100.00	251.94	251.67	937.094	CC, ES
LIVINGSTON S20-25-5C - ORIGINAL WELLBORE - PR	19,400.00	21,756.63	4,707.07	4,323.15	12.261	SF

<b>Offset Design</b>											
Survey Program: 0-INC											
Reference											
Offset											
Semi Major Axis											
Reference											
Offset											
Highside Toolface (°)											
Offset Wellbore Centre											
+N/-S											
+E/-W											
Distance											
Between Centres (usft)											
Between Ellipses (usft)											
Minimum Separation (usft)											
Separation Factor											
Warning											
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)
0.00	0.00	64.00	64.00	0.00	0.76	170.63	-4,245.59	700.44	4,302.98		
100.00	100.00	164.00	164.00	0.13	2.65	170.63	-4,245.59	700.44	4,302.98	4,300.20	2.79
200.00	200.00	264.00	264.00	0.49	4.81	170.63	-4,245.59	700.44	4,302.98	4,297.68	5.30
300.00	300.00	364.00	364.00	0.85	6.86	170.63	-4,245.59	700.44	4,302.98	4,295.27	7.71

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation