

EXTRACTION OIL & GAS

**WELD COUNTY, COLORADO (NAD 83)
NW SW SEC. 21 T2N R67W 6th P.M.
LEONARD 7N**

**ORIGINAL WELLBORE
PROPOSAL #1**

Anticollision Report

28 March, 2017



Anticollision Report



Company:	EXTRACTION OIL & GAS	Local Co-ordinate Reference:	Well LEONARD 7N
Project:	WELD COUNTY, COLORADO (NAD 83)	TVD Reference:	KB-EST @ 5020.0usft (Original Well Elev)
Reference Site:	NW SW SEC. 21 T2N R67W 6th P.M.	MD Reference:	KB-EST @ 5020.0usft (Original Well Elev)
Site Error:	0.0 usft	North Reference:	True
Reference Well:	LEONARD 7N	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	ORIGINAL WELLBORE	Database:	EDM 5000.1 Single User Db
Reference Design:	PROPOSAL #1	Offset TVD Reference:	Offset Datum

Reference	PROPOSAL #1		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	MD + Stations Interval 100.0usft	Error Model:	ISCWSA
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 10,000.0 us	Error Surface:	Elliptical Conic
Warning Levels Evaluated at:	2.00 Sigma	Casing Method:	Not applied

Survey Tool Program	Date	22/11/2016		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.0	12,227.1	PROPOSAL #1 (ORIGINAL WELLBORE)	MWD	MWD - Standard

Summary						
Site Name Offset Well - Wellbore - Design	Reference	Offset	Distance		Separation Factor	Warning
	Measured Depth (usft)	Measured Depth (usft)	Between Centres (usft)	Between Ellipses (usft)		
NW SW SEC. 21 T2N R67W 6th P.M.						
ABDN VERT BERNARD E TEETS B6 - Wellbore #1 - De	3,984.4	3,855.0	1,022.4	930.2	11.095	CC
ABDN VERT BERNARD E TEETS B6 - Wellbore #1 - De	4,600.0	4,457.2	1,030.4	923.4	9.632	ES
ABDN VERT BERNARD E TEETS B6 - Wellbore #1 - De	5,300.0	5,135.0	1,055.1	932.1	8.576	SF
ABDN VERT BERNARD E TEETS B9 - Wellbore #1 - De	5,354.6	5,173.0	763.4	648.4	6.636	CC, ES, SF
EXIST HZ TROUDT #2 - Wellbore #1 - Wellbore #1	6,981.5	18,091.0	1,392.5	1,193.3	6.990	ES, SF
EXIST HZ TROUDT #2 - Wellbore #1 - Wellbore #1	7,397.9	18,091.0	1,271.2	1,201.3	18.182	CC
EXIST HZ TROUDT 1 - Wellbore #1 - Wellbore #1	6,981.5	17,860.0	1,221.3	1,023.3	6.169	ES, SF
EXIST HZ TROUDT 1 - Wellbore #1 - Wellbore #1	7,436.9	17,860.0	1,117.6	1,078.9	28.876	CC
EXIST VERT BERNARD E TEETS #2 - Wellbore #1 - De	6,981.5	6,852.0	1,116.1	963.0	7.289	CC
EXIST VERT BERNARD E TEETS #2 - Wellbore #1 - De	7,000.0	6,870.5	1,116.4	956.7	6.990	ES, SF
EXIST VERT ELKHORN COMPANY B2 - Wellbore #1 - I	500.0	491.0	1,601.0	1,590.6	153.383	CC
EXIST VERT ELKHORN COMPANY B2 - Wellbore #1 - I	600.0	591.0	1,602.5	1,589.8	126.597	ES
EXIST VERT ELKHORN COMPANY B2 - Wellbore #1 - I	8,800.0	7,451.0	2,432.9	2,244.2	12.893	SF
EXIST VERT ELKHORN COMPANY B5 - Wellbore #1 - I	10,883.9	5,210.0	3,198.5	3,056.8	22.563	CC
EXIST VERT ELKHORN COMPANY B5 - Wellbore #1 - I	10,900.0	5,210.0	3,198.6	3,056.5	22.512	ES
EXIST VERT ELKHORN COMPANY B5 - Wellbore #1 - I	12,227.1	5,210.0	3,469.1	3,300.3	20.548	SF
EXIST VERT ELKHORN COMPANY B7 - Wellbore #1 - I	500.0	524.0	2,116.9	2,106.1	196.384	CC
EXIST VERT ELKHORN COMPANY B7 - Wellbore #1 - I	600.0	624.0	2,118.6	2,105.7	163.037	ES
EXIST VERT ELKHORN COMPANY B7 - Wellbore #1 - I	5,626.5	5,230.0	3,075.4	2,949.3	24.397	SF
EXIST VERT ELKHORN COMPANY B9 - Wellbore #1 - I	12,215.2	5,216.0	3,252.7	3,080.5	18.882	CC
EXIST VERT ELKHORN COMPANY B9 - Wellbore #1 - I	12,227.1	5,216.0	3,252.8	3,080.2	18.855	ES, SF
EXIST VERT HORST 44-21 - Wellbore #1 - Design #1	11,905.6	5,220.0	2,296.6	2,235.3	37.483	CC, ES
EXIST VERT HORST 44-21 - Wellbore #1 - Design #1	12,227.1	5,220.0	2,319.0	2,254.9	36.214	SF
EXIST VERT JOHN HORST 43-21 - Wellbore #1 - Desig	12,027.0	5,240.0	2,416.6	2,326.5	26.805	CC, ES
EXIST VERT JOHN HORST 43-21 - Wellbore #1 - Desig	12,227.1	5,240.0	2,424.9	2,332.4	26.215	SF
EXIST VERT LEONARD 13-21 - Wellbore #1 - Design #1	500.0	491.0	266.8	258.4	31.732	CC
EXIST VERT LEONARD 13-21 - Wellbore #1 - Design #1	600.0	591.0	268.5	257.9	25.254	ES
EXIST VERT LEONARD 13-21 - Wellbore #1 - Design #1	5,626.5	5,200.0	1,250.6	1,126.9	10.103	SF
EXIST VERT LEONARD 14-21 - Wellbore #1 - Design #1	4,523.0	4,441.8	850.7	745.9	8.116	CC
EXIST VERT LEONARD 14-21 - Wellbore #1 - Design #1	5,000.0	4,908.4	856.4	740.1	7.363	ES
EXIST VERT LEONARD 14-21 - Wellbore #1 - Design #1	5,300.0	5,146.0	865.5	743.6	7.099	SF
EXIST VERT LEONARD 23-21 - Wellbore #1 - Design #1	500.0	521.0	1,495.5	1,486.8	171.493	CC
EXIST VERT LEONARD 23-21 - Wellbore #1 - Design #1	600.0	621.0	1,496.8	1,485.9	136.753	ES
EXIST VERT LEONARD 23-21 - Wellbore #1 - Design #1	5,626.5	5,216.0	2,298.0	2,175.7	18.781	SF
EXIST VERT LEONARD 24-21 - Wellbore #1 - Design #1	500.0	511.0	1,870.6	1,862.0	217.111	CC
EXIST VERT LEONARD 24-21 - Wellbore #1 - Design #1	1,500.0	1,497.9	1,882.4	1,850.7	59.432	ES
EXIST VERT LEONARD 24-21 - Wellbore #1 - Design #1	5,300.0	5,216.0	2,120.6	1,998.8	17.409	SF

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

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Project:	WELD COUNTY, COLORADO (NAD 83)	TVD Reference:	KB-EST @ 5020.0usft (Original Well Elev)
Reference Site:	NW SW SEC. 21 T2N R67W 6th P.M.	MD Reference:	KB-EST @ 5020.0usft (Original Well Elev)
Site Error:	0.0 usft	North Reference:	True
Reference Well:	LEONARD 7N	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	ORIGINAL WELLBORE	Database:	EDM 5000.1 Single User Db
Reference Design:	PROPOSAL #1	Offset TVD Reference:	Offset Datum

Summary						
Site Name	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
NW SW SEC. 21 T2N R67W 6th P.M.						
EXIST VERT LEONARD 3-21J - Wellbore #1 - Design #1	11,189.7	7,497.0	284.5	33.4	1.133	Level 2, CC
EXIST VERT LEONARD 3-21J - Wellbore #1 - Design #1	11,200.0	7,497.0	284.7	33.3	1.132	Level 2, ES, SF
EXIST VERT LEONARD 33-21 - Wellbore #1 - Design #1	10,715.1	5,218.0	2,453.2	2,374.6	31.220	CC, ES
EXIST VERT LEONARD 33-21 - Wellbore #1 - Design #1	11,700.0	5,218.0	2,643.5	2,552.9	29.185	SF
EXIST VERT LEONARD 34-21 - Wellbore #1 - Design #1	5,400.0	5,250.0	3,433.2	3,311.2	28.138	SF
EXIST VERT LEONARD 34-21 - Wellbore #1 - Design #1	10,722.5	5,250.0	2,279.8	2,229.7	45.563	CC, ES
EXIST VERT LEONARD 4-21J - Wellbore #1 - Design #1	8,725.8	7,468.0	237.2	52.1	1.282	Level 3, CC, ES, SF
EXIST VERT LEONARD 43-21 - Wellbore #1 - Design #1	11,219.0	7,494.0	142.8	-109.1	0.567	Level 1, CC, ES, SF
LEONARD 10N - ORIGINAL WELLBORE - PROPOSAL	200.0	200.0	83.8	83.2	131.271	CC, ES
LEONARD 10N - ORIGINAL WELLBORE - PROPOSAL	12,227.1	12,286.8	680.2	416.8	2.582	SF
LEONARD 11N - ORIGINAL WELLBORE - PROPOSAL	100.0	100.0	111.9	111.7	592.418	CC, ES
LEONARD 11N - ORIGINAL WELLBORE - PROPOSAL	12,227.1	12,351.5	1,020.1	757.1	3.880	SF
LEONARD 1C - ORIGINAL WELLBORE - PROPOSAL #	100.0	96.0	168.0	167.8	907.815	CC, ES
LEONARD 1C - ORIGINAL WELLBORE - PROPOSAL #	12,227.1	12,487.4	1,551.0	1,289.6	5.934	SF
LEONARD 2N - ORIGINAL WELLBORE - PROPOSAL #	300.0	297.0	139.9	138.8	129.405	CC, ES
LEONARD 2N - ORIGINAL WELLBORE - PROPOSAL #	12,227.1	12,225.2	1,360.3	1,095.6	5.139	SF
LEONARD 3N - ORIGINAL WELLBORE - PROPOSAL #	500.0	498.0	112.2	110.2	56.605	CC, ES
LEONARD 3N - ORIGINAL WELLBORE - PROPOSAL #	12,227.1	12,205.9	1,020.0	755.0	3.850	SF
LEONARD 4N - ORIGINAL WELLBORE - PROPOSAL #	500.0	499.0	84.2	82.2	42.404	CC, ES
LEONARD 4N - ORIGINAL WELLBORE - PROPOSAL #	12,227.1	12,200.4	680.1	415.5	2.570	SF
LEONARD 5C - ORIGINAL WELLBORE - PROPOSAL #	500.0	499.0	56.1	54.1	28.270	CC, ES
LEONARD 5C - ORIGINAL WELLBORE - PROPOSAL #	12,227.1	12,453.4	568.4	328.2	2.366	SF
LEONARD 6N - ORIGINAL WELLBORE - PROPOSAL #	500.0	500.0	28.1	26.1	14.118	CC, ES
LEONARD 6N - ORIGINAL WELLBORE - PROPOSAL #	12,227.1	12,208.8	340.2	76.1	1.288	Level 3, SF
LEONARD 8N - ORIGINAL WELLBORE - PROPOSAL #	400.0	400.0	28.1	26.5	18.249	CC, ES
LEONARD 8N - ORIGINAL WELLBORE - PROPOSAL #	12,227.1	12,247.7	339.9	76.6	1.291	Level 3, SF
LEONARD 9C - ORIGINAL WELLBORE - PROPOSAL #	300.0	300.0	56.1	55.0	51.576	CC, ES
LEONARD 9C - ORIGINAL WELLBORE - PROPOSAL #	12,227.1	12,507.7	568.0	330.9	2.396	SF

Offset Design													Offset Site Error:	0.0 usft		
Survey Program: 0-INC													Offset Well Error:	0.0 usft		
Reference													Distance		Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Semi Major Axis Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor				
0.0	0.0	0.0	0.0	0.0	0.0	-83.44	139.2	-1,210.1	1,219.7							
100.0	100.0	38.0	38.0	0.1	0.2	-83.44	139.2	-1,210.1	1,218.1	1,217.8	0.31	3,969.176				
200.0	200.0	138.0	138.0	0.3	1.5	-83.44	139.2	-1,210.1	1,218.1	1,216.3	1.81	672.144				
300.0	300.0	238.0	238.0	0.5	3.8	-83.44	139.2	-1,210.1	1,218.1	1,213.7	4.35	279.947				
400.0	400.0	338.0	338.0	0.8	5.9	-83.44	139.2	-1,210.1	1,218.1	1,211.4	6.64	183.422				
500.0	500.0	438.0	438.0	1.0	7.9	-83.44	139.2	-1,210.1	1,218.1	1,209.2	8.90	136.845				
600.0	600.0	538.0	538.0	1.2	9.9	57.15	139.2	-1,210.1	1,217.1	1,206.0	11.12	109.407				
700.0	699.8	637.8	637.8	1.4	11.9	57.41	139.2	-1,210.1	1,214.3	1,201.0	13.33	91.121				
800.0	799.5	737.5	737.5	1.6	14.0	57.84	139.2	-1,210.1	1,209.6	1,194.1	15.54	77.863				
900.0	898.7	836.7	836.7	1.9	16.0	58.43	139.2	-1,210.1	1,203.2	1,185.4	17.76	67.759				
1,000.0	997.5	935.5	935.5	2.2	18.0	59.21	139.2	-1,210.1	1,195.0	1,175.0	20.00	59.761				
1,099.9	1,095.5	1,033.5	1,033.5	2.5	19.9	60.16	139.2	-1,210.1	1,185.2	1,163.0	22.26	53.249				
1,100.0	1,095.6	1,033.6	1,033.6	2.5	19.9	60.16	139.2	-1,210.1	1,185.2	1,163.0	22.26	53.242				
1,200.0	1,193.4	1,131.4	1,131.4	2.9	21.9	61.02	139.2	-1,210.1	1,174.8	1,150.3	24.59	47.779				
1,300.0	1,291.3	1,229.3	1,229.3	3.3	23.9	61.90	139.2	-1,210.1	1,164.7	1,137.8	26.94	43.237				
1,400.0	1,389.1	1,327.1	1,327.1	3.7	25.8	62.80	139.2	-1,210.1	1,154.9	1,125.6	29.30	39.412				

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