

# **EXTRACTION OIL & GAS**

**WELD COUNTY, COLORADO (NAD 83)  
SW SW SEC. 22 T4N R68W 6th P.M.  
HFE 7**

**ORIGINAL WELLBORE  
PROPOSAL #3**

## **Anticollision Report**

**17 January, 2017**



## Anticollision Report



<b>Company:</b>	EXTRACTION OIL & GAS	<b>Local Co-ordinate Reference:</b>	Well HFE 7
<b>Project:</b>	WELD COUNTY, COLORADO (NAD 83)	<b>TVD Reference:</b>	KB-EST @ 4934.0usft
<b>Reference Site:</b>	SW SW SEC. 22 T4N R68W 6th P.M.	<b>MD Reference:</b>	KB-EST @ 4934.0usft
<b>Site Error:</b>	0.0 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	HFE 7	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	ORIGINAL WELLBORE	<b>Database:</b>	EDM 5000.1 Single User Db
<b>Reference Design:</b>	PROPOSAL #3	<b>Offset TVD Reference:</b>	Offset Datum

<b>Reference</b>	PROPOSAL #3		
<b>Filter type:</b>	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
<b>Interpolation Method:</b>	MD + Stations Interval 100.0usft	<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 10,000.0 us	<b>Error Surface:</b>	Elliptical Conic
<b>Warning Levels Evaluated at:</b>	2.00 Sigma	<b>Casing Method:</b>	Not applied

<b>Survey Tool Program</b>	<b>Date</b> 17/01/2017			
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>
0.0	12,083.7	PROPOSAL #3 (ORIGINAL WELLBORE)	MWD	MWD - Standard

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						
SW SW SEC. 22 T4N R68W 6th P.M.						
ABDN VERT CRESSWELL #2 - Wellbore #1 - Design #1	11,236.1	7,210.9	32.6	-221.8	0.128	Level 1, CC, ES, SF
EXIST DD HFE #14-22 - Wellbore #1 - Wellbore #1	0.0	1.9	247.7			
EXIST DD HFE #14-22 - Wellbore #1 - Wellbore #1	712.8	714.8	249.3	246.5	87.219	ES
EXIST DD HFE #14-22 - Wellbore #1 - Wellbore #1	8,200.0	7,224.7	945.6	895.9	19.009	SF
EXIST DD HFE #22SE - Wellbore #1 - Wellbore #1	11,221.0	7,295.3	226.2	93.9	1.710	CC, ES, SF
EXIST DD HFE #24-22 - Wellbore #1 - Wellbore #1	1,848.1	1,882.4	136.0	126.6	14.499	CC, ES
EXIST DD HFE #24-22 - Wellbore #1 - Wellbore #1	9,400.0	7,354.8	892.5	805.0	10.199	SF
EXIST DD HFE #34-22 - Wellbore #1 - Wellbore #1	10,524.0	7,250.3	877.4	770.4	8.199	CC, ES
EXIST DD HFE #34-22 - Wellbore #1 - Wellbore #1	10,700.0	7,249.3	894.9	783.1	8.008	SF
EXIST DD HFE #44-22 - Wellbore #1 - Wellbore #1	11,866.3	7,492.4	885.5	723.8	5.476	CC
EXIST DD HFE #44-22 - Wellbore #1 - Wellbore #1	11,900.0	7,492.5	886.1	723.5	5.449	ES
EXIST DD HFE #44-22 - Wellbore #1 - Wellbore #1	12,000.0	7,492.7	895.5	730.2	5.416	SF
EXIST DD MLD #13-22 - Wellbore #1 - Wellbore #1	0.0	2.0	232.9			
EXIST DD MLD #13-22 - Wellbore #1 - Wellbore #1	200.0	200.7	233.3	232.6	350.114	ES
EXIST DD MLD #13-22 - Wellbore #1 - Wellbore #1	8,000.0	7,190.6	531.8	484.3	11.199	SF
EXIST DD MLD #23-22 - Wellbore #1 - Wellbore #1	1,419.8	1,439.5	120.4	113.8	18.293	CC, ES
EXIST DD MLD #23-22 - Wellbore #1 - Wellbore #1	9,300.0	7,370.6	448.7	363.1	5.241	SF
EXIST DD MLD #33-22 - Wellbore #1 - Wellbore #1	10,563.3	7,270.1	447.4	338.4	4.104	CC, ES
EXIST DD MLD #33-22 - Wellbore #1 - Wellbore #1	10,600.0	7,269.3	448.9	338.9	4.081	SF
EXIST DD MLD #43-22 - Wellbore #1 - Wellbore #1	11,887.3	7,512.1	439.6	277.3	2.709	CC
EXIST DD MLD #43-22 - Wellbore #1 - Wellbore #1	11,900.0	7,512.2	439.8	277.2	2.704	ES, SF
HFE 1 - ORIGINAL WELLBORE - PROPOSAL #3	0.0	1.0	168.0			
HFE 1 - ORIGINAL WELLBORE - PROPOSAL #3	1,600.0	1,600.7	171.3	164.6	25.465	ES
HFE 1 - ORIGINAL WELLBORE - PROPOSAL #3	12,083.7	12,477.3	1,136.9	892.5	4.652	SF
HFE 2 - ORIGINAL WELLBORE - PROPOSAL #3	1,666.3	1,667.3	140.1	132.8	19.367	CC
HFE 2 - ORIGINAL WELLBORE - PROPOSAL #3	1,700.0	1,700.0	140.1	132.7	18.976	ES
HFE 2 - ORIGINAL WELLBORE - PROPOSAL #3	12,083.7	11,976.0	1,562.8	1,299.5	5.934	SF
HFE 3 - ORIGINAL WELLBORE - PROPOSAL #3	1,766.0	1,768.0	112.2	104.5	14.601	CC
HFE 3 - ORIGINAL WELLBORE - PROPOSAL #3	1,800.0	1,801.9	112.2	104.3	14.317	ES
HFE 3 - ORIGINAL WELLBORE - PROPOSAL #3	12,083.7	12,093.7	1,240.1	975.5	4.686	SF
HFE 4 - ORIGINAL WELLBORE - PROPOSAL #3	1,866.3	1,867.3	84.0	75.9	10.329	CC
HFE 4 - ORIGINAL WELLBORE - PROPOSAL #3	1,900.0	1,900.0	84.0	75.7	10.143	ES
HFE 4 - ORIGINAL WELLBORE - PROPOSAL #3	12,083.7	11,869.5	950.5	690.2	3.652	SF
HFE 5 - ORIGINAL WELLBORE - PROPOSAL #3	1,966.3	1,967.3	56.1	47.5	6.536	CC
HFE 5 - ORIGINAL WELLBORE - PROPOSAL #3	2,000.0	2,001.0	56.1	47.3	6.422	ES
HFE 5 - ORIGINAL WELLBORE - PROPOSAL #3	12,083.7	12,038.6	620.0	354.6	2.336	SF
HFE 6 - ORIGINAL WELLBORE - PROPOSAL #3	2,100.0	2,100.0	27.9	18.7	3.040	CC, ES

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

# Anticollision Report



<b>Company:</b>	EXTRACTION OIL & GAS	<b>Local Co-ordinate Reference:</b>	Well HFE 7
<b>Project:</b>	WELD COUNTY, COLORADO (NAD 83)	<b>TVD Reference:</b>	KB-EST @ 4934.0usft
<b>Reference Site:</b>	SW SW SEC. 22 T4N R68W 6th P.M.	<b>MD Reference:</b>	KB-EST @ 4934.0usft
<b>Site Error:</b>	0.0 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	HFE 7	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.0 usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	ORIGINAL WELLBORE	<b>Database:</b>	EDM 5000.1 Single User Db
<b>Reference Design:</b>	PROPOSAL #3	<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						
SW SW SEC. 22 T4N R68W 6th P.M.						
HFE 6 - ORIGINAL WELLBORE - PROPOSAL #3	12,083.7	11,862.8	366.2	137.7	1.602	SF
HFE 8 - ORIGINAL WELLBORE - PROPOSAL #3	2,200.0	2,200.0	27.9	18.3	2.897	CC, ES
HFE 8 - ORIGINAL WELLBORE - PROPOSAL #3	12,083.7	11,971.1	366.2	133.9	1.576	SF
MLD 1 - ORIGINAL WELLBORE - PROPOSAL #1	6,687.1	7,424.8	620.4	569.0	12.055	CC
MLD 1 - ORIGINAL WELLBORE - PROPOSAL #1	12,083.7	12,518.8	699.5	462.0	2.945	ES, SF
MLD 12 - ORIGINAL WELLBORE - PROPOSAL #1	6,789.7	7,282.2	404.0	337.1	6.036	CC
MLD 12 - ORIGINAL WELLBORE - PROPOSAL #1	12,083.7	12,721.9	416.4	158.0	1.611	ES, SF
WILSON RANCH 30C-27HZ - Wellbore #1 - Design #1	7,669.2	16,444.6	1,602.7	1,314.0	5.552	CC, ES
WILSON RANCH 30C-27HZ - Wellbore #1 - Design #1	7,700.0	16,444.6	1,603.0	1,314.1	5.549	SF

Offset Design												Offset Site Error:	0.0 usft
Survey Program: 0-INC												Offset Well Error:	0.0 usft
Reference	Offset	Semi Major Axis		Distance		Minimum Separation		Warning					
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	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	Warning
0.0	0.0	46.0	46.0	0.0	0.2	81.16	459.6	2,956.6	2,992.1				
100.0	100.0	146.0	146.0	0.1	1.7	81.16	459.6	2,956.6	2,992.1	2,990.3	1.76	1,698.797	
200.0	200.0	246.0	246.0	0.3	4.0	81.16	459.6	2,956.6	2,992.1	2,987.8	4.27	700.023	
300.0	300.0	346.0	346.0	0.5	6.0	81.16	459.6	2,956.6	2,992.1	2,985.5	6.56	456.078	
400.0	400.0	446.0	446.0	0.8	8.1	81.16	459.6	2,956.6	2,992.1	2,983.3	8.82	339.259	
500.0	500.0	546.0	546.0	1.0	10.1	81.16	459.6	2,956.6	2,992.1	2,981.0	11.07	270.318	
600.0	600.0	646.0	646.0	1.2	12.1	81.16	459.6	2,956.6	2,992.1	2,978.8	13.31	224.742	
700.0	700.0	746.0	746.0	1.4	14.1	81.16	459.6	2,956.6	2,992.1	2,976.5	15.56	192.349	
800.0	800.0	846.0	846.0	1.7	16.1	81.16	459.6	2,956.6	2,992.1	2,974.3	17.80	168.133	
900.0	900.0	946.0	946.0	1.9	18.1	81.16	459.6	2,956.6	2,992.1	2,972.1	20.04	149.341	
1,000.0	1,000.0	1,046.0	1,046.0	2.1	20.2	81.16	459.6	2,956.6	2,992.1	2,969.8	22.27	134.331	
1,100.0	1,100.0	1,146.0	1,146.0	2.3	22.2	81.16	459.6	2,956.6	2,992.1	2,967.6	24.51	122.066	
1,200.0	1,200.0	1,246.0	1,246.0	2.6	24.2	81.16	459.6	2,956.6	2,992.1	2,965.3	26.75	111.855	
1,300.0	1,300.0	1,346.0	1,346.0	2.8	26.2	81.16	459.6	2,956.6	2,992.1	2,963.1	28.99	103.221	
1,400.0	1,400.0	1,446.0	1,446.0	3.0	28.2	81.16	459.6	2,956.6	2,992.1	2,960.9	31.22	95.826	
1,500.0	1,500.0	1,546.0	1,546.0	3.2	30.2	81.16	459.6	2,956.6	2,992.1	2,958.6	33.46	89.419	
1,600.0	1,600.0	1,646.0	1,646.0	3.5	32.2	81.16	459.6	2,956.6	2,992.1	2,956.4	35.70	83.817	
1,700.0	1,700.0	1,746.0	1,746.0	3.7	34.2	81.16	459.6	2,956.6	2,992.1	2,954.2	37.93	78.875	
1,800.0	1,800.0	1,846.0	1,846.0	3.9	36.3	81.16	459.6	2,956.6	2,992.1	2,951.9	40.17	74.483	
1,900.0	1,900.0	1,946.0	1,946.0	4.1	38.3	81.16	459.6	2,956.6	2,992.1	2,949.7	42.41	70.555	
2,000.0	2,000.0	2,046.0	2,046.0	4.4	40.3	81.16	459.6	2,956.6	2,992.1	2,947.4	44.64	67.021	
2,100.0	2,100.0	2,146.0	2,146.0	4.6	42.3	81.16	459.6	2,956.6	2,992.1	2,945.2	46.88	63.824	
2,200.0	2,200.0	2,246.0	2,246.0	4.8	44.3	81.16	459.6	2,956.6	2,992.1	2,943.0	49.12	60.918	
2,300.0	2,300.0	2,346.0	2,346.0	5.0	46.3	152.26	459.6	2,956.6	2,993.6	2,942.3	51.32	58.334	
2,400.0	2,399.8	2,445.8	2,445.8	5.2	48.3	152.26	459.6	2,956.6	2,998.3	2,944.8	53.46	56.087	
2,500.0	2,499.5	2,545.5	2,545.5	5.5	50.3	152.27	459.6	2,956.6	3,006.0	2,950.5	55.54	54.127	
2,600.0	2,598.7	2,644.7	2,644.7	5.7	52.3	152.27	459.6	2,956.6	3,016.8	2,959.2	57.55	52.424	
2,700.0	2,697.5	2,743.5	2,743.5	5.9	54.3	152.28	459.6	2,956.6	3,030.7	2,971.2	59.48	50.950	
2,800.0	2,795.6	2,841.6	2,841.6	6.2	56.3	152.29	459.6	2,956.6	3,047.6	2,986.3	61.34	49.682	
2,900.0	2,893.1	2,939.1	2,939.1	6.5	58.2	152.29	459.6	2,956.6	3,067.7	3,004.5	63.12	48.602	
3,000.0	2,989.6	3,035.6	3,035.6	6.9	60.2	152.29	459.6	2,956.6	3,090.7	3,025.9	64.81	47.691	
3,100.0	3,085.3	3,131.3	3,131.3	7.3	62.1	152.29	459.6	2,956.6	3,116.9	3,050.5	66.41	46.935	
3,200.0	3,179.8	3,225.8	3,225.8	7.7	64.0	152.28	459.6	2,956.6	3,146.0	3,078.1	67.92	46.321	
3,209.3	3,188.6	3,234.6	3,234.6	7.8	64.2	152.28	459.6	2,956.6	3,148.9	3,080.8	68.05	46.271	

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