

# **EXTRACTION OIL & GAS**

**WELD COUNTY, COLORADO (NAD 83)  
SW SW SEC. 22 T4N R68W 6th P.M.  
HFE 4**

**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 4
<b>Project:</b>	WELD COUNTY, COLORADO (NAD 83)	<b>TVD Reference:</b>	KB-EST @ 4935.0usft
<b>Reference Site:</b>	SW SW SEC. 22 T4N R68W 6th P.M.	<b>MD Reference:</b>	KB-EST @ 4935.0usft
<b>Site Error:</b>	0.0 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	HFE 4	<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	11,869.1	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	11,040.1	7,015.0	897.3	647.8	3.596	CC, ES
ABDN VERT CRESSWELL #2 - Wellbore #1 - Design #1	11,100.0	7,015.0	899.3	648.2	3.581	SF
EXIST DD HFE #14-22 - Wellbore #1 - Wellbore #1	7,670.3	7,010.2	42.4	-0.1	0.999	Level 1, CC, ES, SF
EXIST DD HFE #22SE - Wellbore #1 - Wellbore #1	11,029.7	7,083.1	700.4	569.2	5.339	CC, ES
EXIST DD HFE #22SE - Wellbore #1 - Wellbore #1	11,100.0	7,081.6	703.9	570.8	5.288	SF
EXIST DD HFE #24-22 - Wellbore #1 - Wellbore #1	8,990.0	7,147.0	61.3	-19.3	0.760	Level 1, CC, ES, SF
EXIST DD HFE #34-22 - Wellbore #1 - Wellbore #1	10,329.5	7,042.6	50.4	-55.3	0.477	Level 1, CC, ES, SF
EXIST DD HFE #44-22 - Wellbore #1 - Wellbore #1	11,669.8	7,280.0	40.6	-119.9	0.253	Level 1, CC, ES, SF
EXIST DD MLD #13-22 - Wellbore #1 - Wellbore #1	0.0	1.0	148.9			
EXIST DD MLD #13-22 - Wellbore #1 - Wellbore #1	200.0	200.1	149.3	148.7	224.504	ES
EXIST DD MLD #13-22 - Wellbore #1 - Wellbore #1	1,700.0	1,679.4	204.9	197.1	26.304	SF
EXIST DD MLD #23-22 - Wellbore #1 - Wellbore #1	1,182.6	1,192.4	65.8	60.6	12.614	CC, ES
EXIST DD MLD #23-22 - Wellbore #1 - Wellbore #1	1,300.0	1,305.4	72.9	66.8	11.952	SF
EXIST DD MLD #33-22 - Wellbore #1 - Wellbore #1	10,370.7	7,078.3	1,374.4	1,266.7	12.760	CC
EXIST DD MLD #33-22 - Wellbore #1 - Wellbore #1	10,400.0	7,077.9	1,374.7	1,266.2	12.670	ES
EXIST DD MLD #33-22 - Wellbore #1 - Wellbore #1	10,800.0	7,073.4	1,439.9	1,320.5	12.065	SF
EXIST DD MLD #43-22 - Wellbore #1 - Wellbore #1	11,690.7	7,316.9	1,365.3	1,204.2	8.472	CC
EXIST DD MLD #43-22 - Wellbore #1 - Wellbore #1	11,700.0	7,316.9	1,365.4	1,204.0	8.459	ES
EXIST DD MLD #43-22 - Wellbore #1 - Wellbore #1	11,869.5	7,317.2	1,377.0	1,210.9	8.292	SF
HFE 1 - ORIGINAL WELLBORE - PROPOSAL #3	4,378.9	4,343.1	45.7	15.9	1.534	CC
HFE 1 - ORIGINAL WELLBORE - PROPOSAL #3	4,500.0	4,463.7	47.0	15.0	1.470	Level 3, ES, SF
HFE 2 - ORIGINAL WELLBORE - PROPOSAL #3	1,700.0	1,700.0	56.1	48.7	7.598	CC, ES
HFE 2 - ORIGINAL WELLBORE - PROPOSAL #3	11,869.5	11,976.0	620.4	356.7	2.352	SF
HFE 3 - ORIGINAL WELLBORE - PROPOSAL #3	1,766.3	1,767.3	28.2	20.5	3.669	CC
HFE 3 - ORIGINAL WELLBORE - PROPOSAL #3	1,800.0	1,801.0	28.2	20.4	3.598	ES
HFE 3 - ORIGINAL WELLBORE - PROPOSAL #3	11,869.5	12,093.7	365.7	139.9	1.620	SF
HFE 5 - ORIGINAL WELLBORE - PROPOSAL #3	1,900.0	1,900.0	27.9	19.6	3.370	CC, ES
HFE 5 - ORIGINAL WELLBORE - PROPOSAL #3	11,869.5	12,032.8	366.2	138.6	1.609	SF
HFE 6 - ORIGINAL WELLBORE - PROPOSAL #3	1,900.0	1,899.0	56.1	47.8	6.775	CC, ES
HFE 6 - ORIGINAL WELLBORE - PROPOSAL #3	11,869.5	11,850.5	619.9	354.9	2.340	SF
HFE 7 - ORIGINAL WELLBORE - PROPOSAL #3	1,900.0	1,899.0	84.0	75.7	10.145	CC, ES
HFE 7 - ORIGINAL WELLBORE - PROPOSAL #3	11,869.5	12,065.6	950.3	690.6	3.658	SF
HFE 8 - ORIGINAL WELLBORE - PROPOSAL #3	1,900.0	1,899.0	111.9	103.6	13.515	CC, ES
HFE 8 - ORIGINAL WELLBORE - PROPOSAL #3	11,869.5	11,953.0	1,239.9	973.8	4.661	SF
MLD 1 - ORIGINAL WELLBORE - PROPOSAL #1	6,164.8	7,000.0	1,545.3	1,493.6	29.918	CC
MLD 1 - ORIGINAL WELLBORE - PROPOSAL #1	11,869.5	12,500.8	1,555.1	1,292.6	5.924	ES, SF
MLD 12 - ORIGINAL WELLBORE - PROPOSAL #1	6,577.9	7,086.1	1,330.5	1,263.1	19.737	CC

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

# Anticollision Report



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<b>Reference Site:</b>	SW SW SEC. 22 T4N R68W 6th P.M.	<b>MD Reference:</b>	KB-EST @ 4935.0usft
<b>Site Error:</b>	0.0 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	HFE 4	<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.						
MLD 12 - ORIGINAL WELLBORE - PROPOSAL #1	11,869.5	12,703.9	1,365.9	1,106.0	5.254	ES, SF
WILSON RANCH 30C-27HZ - Wellbore #1 - Design #1	7,472.7	16,444.6	729.7	464.1	2.747	CC, ES
WILSON RANCH 30C-27HZ - Wellbore #1 - Design #1	7,477.9	16,444.6	729.7	464.1	2.747	SF

Offset Design													Offset Site Error:	0.0 usft
Survey Program: 0-INC													Offset Well Error:	0.0 usft
Reference														
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)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
0.0	0.0	45.0	45.0	0.0	0.2	81.37	461.4	3,040.6	3,075.4					
100.0	100.0	145.0	145.0	0.1	1.6	81.37	461.4	3,040.6	3,075.4	3,073.6	1.74	1,770.867		
200.0	200.0	245.0	245.0	0.3	3.9	81.37	461.4	3,040.6	3,075.4	3,071.1	4.25	723.022		
300.0	300.0	345.0	345.0	0.5	6.0	81.37	461.4	3,040.6	3,075.4	3,068.8	6.54	470.233		
400.0	400.0	445.0	445.0	0.8	8.0	81.37	461.4	3,040.6	3,075.4	3,066.6	8.80	349.504		
500.0	500.0	545.0	545.0	1.0	10.1	81.37	461.4	3,040.6	3,075.4	3,064.3	11.05	278.349		
600.0	600.0	645.0	645.0	1.2	12.1	81.37	461.4	3,040.6	3,075.4	3,062.1	13.29	231.347		
700.0	700.0	745.0	745.0	1.4	14.1	81.37	461.4	3,040.6	3,075.4	3,059.8	15.54	197.959		
800.0	800.0	845.0	845.0	1.7	16.1	81.37	461.4	3,040.6	3,075.4	3,057.6	17.78	173.008		
900.0	900.0	945.0	945.0	1.9	18.1	81.37	461.4	3,040.6	3,075.4	3,055.3	20.02	153.651		
1,000.0	1,000.0	1,045.0	1,045.0	2.1	20.1	81.37	461.4	3,040.6	3,075.4	3,053.1	22.25	138.195		
1,100.0	1,100.0	1,145.0	1,145.0	2.3	22.1	81.37	461.4	3,040.6	3,075.4	3,050.9	24.49	125.566		
1,200.0	1,200.0	1,245.0	1,245.0	2.6	24.2	81.37	461.4	3,040.6	3,075.4	3,048.6	26.73	115.054		
1,300.0	1,300.0	1,345.0	1,345.0	2.8	26.2	81.37	461.4	3,040.6	3,075.4	3,046.4	28.97	106.168		
1,400.0	1,400.0	1,445.0	1,445.0	3.0	28.2	81.37	461.4	3,040.6	3,075.4	3,044.2	31.20	98.556		
1,500.0	1,500.0	1,545.0	1,545.0	3.2	30.2	81.37	461.4	3,040.6	3,075.4	3,041.9	33.44	91.963		
1,600.0	1,600.0	1,645.0	1,645.0	3.5	32.2	81.37	461.4	3,040.6	3,075.4	3,039.7	35.68	86.198		
1,700.0	1,700.0	1,745.0	1,745.0	3.7	34.2	81.37	461.4	3,040.6	3,075.4	3,037.4	37.91	81.113		
1,800.0	1,800.0	1,845.0	1,845.0	3.9	36.2	81.37	461.4	3,040.6	3,075.4	3,035.2	40.15	76.594		
1,900.0	1,900.0	1,945.0	1,945.0	4.1	38.2	81.37	461.4	3,040.6	3,075.4	3,033.0	42.39	72.553		
2,000.0	2,000.0	2,045.0	2,045.0	4.3	40.3	-162.34	461.4	3,040.6	3,077.0	3,032.4	44.58	69.025		
2,100.0	2,099.8	2,144.8	2,144.8	4.5	42.3	-162.34	461.4	3,040.6	3,082.0	3,035.3	46.70	66.002		
2,200.0	2,199.5	2,244.5	2,244.5	4.7	44.3	-162.34	461.4	3,040.6	3,090.3	3,041.6	48.75	63.389		
2,300.0	2,298.7	2,343.7	2,343.7	4.9	46.3	-162.34	461.4	3,040.6	3,101.9	3,051.2	50.74	61.135		
2,400.0	2,397.5	2,442.5	2,442.5	5.2	48.3	-162.33	461.4	3,040.6	3,116.9	3,064.2	52.65	59.199		
2,500.0	2,495.6	2,540.6	2,540.6	5.5	50.2	-162.33	461.4	3,040.6	3,135.1	3,080.6	54.48	57.547		
2,600.0	2,593.1	2,638.1	2,638.1	5.8	52.2	-162.32	461.4	3,040.6	3,156.6	3,100.3	56.22	56.149		
2,700.0	2,689.6	2,734.6	2,734.6	6.1	54.1	-162.30	461.4	3,040.6	3,181.3	3,123.4	57.86	54.980		
2,800.0	2,785.3	2,830.3	2,830.3	6.5	56.1	-162.28	461.4	3,040.6	3,209.2	3,149.8	59.41	54.021		
2,839.0	2,822.3	2,867.3	2,867.3	6.7	56.8	-162.28	461.4	3,040.6	3,221.0	3,161.0	59.98	53.699		
2,900.0	2,880.0	2,925.0	2,925.0	7.0	58.0	-162.38	461.4	3,040.6	3,239.8	3,178.6	61.24	52.900		
3,000.0	2,974.7	3,019.7	3,019.7	7.5	59.9	-162.55	461.4	3,040.6	3,270.7	3,207.3	63.32	51.652		
3,100.0	3,069.4	3,114.4	3,114.4	8.0	61.8	-162.72	461.4	3,040.6	3,301.5	3,236.1	65.41	50.477		
3,200.0	3,164.1	3,209.1	3,209.1	8.6	63.7	-162.88	461.4	3,040.6	3,332.4	3,264.9	67.50	49.369		
3,300.0	3,258.7	3,303.7	3,303.7	9.2	65.6	-163.04	461.4	3,040.6	3,363.3	3,293.7	69.60	48.325		
3,400.0	3,353.4	3,398.4	3,398.4	9.8	67.5	-163.20	461.4	3,040.6	3,394.3	3,322.6	71.70	47.338		
3,500.0	3,448.1	3,493.1	3,493.1	10.4	69.4	-163.36	461.4	3,040.6	3,425.3	3,351.4	73.81	46.405		
3,600.0	3,542.8	3,587.8	3,587.8	11.0	71.3	-163.51	461.4	3,040.6	3,456.2	3,380.3	75.93	45.522		
3,700.0	3,637.4	3,682.4	3,682.4	11.6	73.2	-163.66	461.4	3,040.6	3,487.3	3,409.2	78.04	44.685		
3,800.0	3,732.1	3,777.1	3,777.1	12.2	75.1	-163.80	461.4	3,040.6	3,518.3	3,438.1	80.16	43.891		

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