

EXTRACTION OIL & GAS

**WELD COUNTY, COLORADO (NAD 83)
SW SW SEC. 22 T4N R68W 6th P.M.
HFE 8**

**ORIGINAL WELLBORE
PROPOSAL #3**

Anticollision Report

17 January, 2017



Anticollision Report



Company:	EXTRACTION OIL & GAS	Local Co-ordinate Reference:	Well HFE 8
Project:	WELD COUNTY, COLORADO (NAD 83)	TVD Reference:	KB-EST @ 4934.0usft
Reference Site:	SW SW SEC. 22 T4N R68W 6th P.M.	MD Reference:	KB-EST @ 4934.0usft
Site Error:	0.0 usft	North Reference:	True
Reference Well:	HFE 8	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 #3	Offset TVD Reference:	Offset Datum

Reference	PROPOSAL #3		
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 17/01/2017			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.0	11,977.2	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	11,123.5	7,016.0	342.6	91.1	1.362	Level 3, CC, ES, SF
EXIST DD HFE #14-22 - Wellbore #1 - Wellbore #1	0.0	1.9	275.6			
EXIST DD HFE #14-22 - Wellbore #1 - Wellbore #1	719.3	721.3	277.2	274.3	95.977	ES
EXIST DD HFE #14-22 - Wellbore #1 - Wellbore #1	8,500.0	7,020.5	1,411.1	1,352.3	24.008	SF
EXIST DD HFE #22SE - Wellbore #1 - Wellbore #1	11,112.6	7,106.5	539.3	406.1	4.049	CC, ES
EXIST DD HFE #22SE - Wellbore #1 - Wellbore #1	11,200.0	7,104.6	546.3	410.8	4.030	SF
EXIST DD HFE #24-22 - Wellbore #1 - Wellbore #1	1,907.6	1,945.6	136.7	126.7	13.678	CC, ES
EXIST DD HFE #24-22 - Wellbore #1 - Wellbore #1	2,000.0	2,029.2	141.1	130.2	12.996	SF
EXIST DD HFE #34-22 - Wellbore #1 - Wellbore #1	10,412.8	7,056.2	1,189.5	1,081.8	11.043	CC, ES
EXIST DD HFE #34-22 - Wellbore #1 - Wellbore #1	10,800.0	7,052.5	1,250.9	1,132.8	10.589	SF
EXIST DD HFE #44-22 - Wellbore #1 - Wellbore #1	11,753.3	7,305.4	1,199.0	1,036.5	7.379	CC
EXIST DD HFE #44-22 - Wellbore #1 - Wellbore #1	11,800.0	7,305.5	1,199.9	1,036.1	7.327	ES
EXIST DD HFE #44-22 - Wellbore #1 - Wellbore #1	11,977.2	7,305.7	1,219.7	1,051.1	7.233	SF
EXIST DD MLD #13-22 - Wellbore #1 - Wellbore #1	7,766.0	7,042.8	186.8	140.2	4.008	CC, ES, SF
EXIST DD MLD #23-22 - Wellbore #1 - Wellbore #1	9,102.2	7,192.5	124.0	39.6	1.469	Level 3, CC, ES, SF
EXIST DD MLD #33-22 - Wellbore #1 - Wellbore #1	10,454.0	7,084.5	134.5	24.7	1.225	Level 2, CC, ES, SF
EXIST DD MLD #43-22 - Wellbore #1 - Wellbore #1	11,774.1	7,328.4	125.5	-37.5	0.770	Level 1, CC, ES, SF
HFE 1 - ORIGINAL WELLBORE - PROPOSAL #3	0.0	1.0	195.9			
HFE 1 - ORIGINAL WELLBORE - PROPOSAL #3	1,600.0	1,600.7	198.8	192.0	29.526	ES
HFE 1 - ORIGINAL WELLBORE - PROPOSAL #3	11,977.6	12,477.3	1,500.2	1,258.0	6.194	SF
HFE 2 - ORIGINAL WELLBORE - PROPOSAL #3	1,666.3	1,667.3	168.0	160.7	23.224	CC
HFE 2 - ORIGINAL WELLBORE - PROPOSAL #3	1,700.0	1,700.0	168.0	160.6	22.756	ES
HFE 2 - ORIGINAL WELLBORE - PROPOSAL #3	11,977.6	11,976.0	1,860.5	1,594.2	6.987	SF
HFE 3 - ORIGINAL WELLBORE - PROPOSAL #3	1,766.0	1,768.0	140.1	132.4	18.232	CC
HFE 3 - ORIGINAL WELLBORE - PROPOSAL #3	1,800.0	1,801.9	140.1	132.2	17.878	ES
HFE 3 - ORIGINAL WELLBORE - PROPOSAL #3	11,977.6	12,093.7	1,562.1	1,298.1	5.918	SF
HFE 4 - ORIGINAL WELLBORE - PROPOSAL #3	1,866.3	1,867.3	111.9	103.8	13.760	CC
HFE 4 - ORIGINAL WELLBORE - PROPOSAL #3	1,900.0	1,900.0	111.9	103.6	13.512	ES
HFE 4 - ORIGINAL WELLBORE - PROPOSAL #3	11,977.6	11,869.5	1,240.1	973.4	4.650	SF
HFE 5 - ORIGINAL WELLBORE - PROPOSAL #3	1,966.3	1,967.3	84.0	75.4	9.787	CC
HFE 5 - ORIGINAL WELLBORE - PROPOSAL #3	2,000.0	2,000.0	84.0	75.3	9.620	ES
HFE 5 - ORIGINAL WELLBORE - PROPOSAL #3	11,977.6	12,038.6	950.1	688.2	3.628	SF
HFE 6 - ORIGINAL WELLBORE - PROPOSAL #3	2,100.0	2,100.0	55.8	46.6	6.079	CC, ES
HFE 6 - ORIGINAL WELLBORE - PROPOSAL #3	11,977.6	11,862.8	620.0	352.2	2.315	SF
HFE 7 - ORIGINAL WELLBORE - PROPOSAL #3	2,200.0	2,200.0	27.9	18.3	2.897	CC, ES
HFE 7 - ORIGINAL WELLBORE - PROPOSAL #3	11,977.6	12,083.7	366.3	133.8	1.575	SF
MLD 1 - ORIGINAL WELLBORE - PROPOSAL #1	6,771.0	7,426.2	310.0	257.4	5.891	CC

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

Anticollision Report



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Site Error:	0.0 usft	North Reference:	True
Reference Well:	HFE 8	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 #3	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
Offset Well - Wellbore - Design						
SW SW SEC. 22 T4N R68W 6th P.M.						
MLD 1 - ORIGINAL WELLBORE - PROPOSAL #1	11,977.6	12,525.4	335.7	87.8	1.354	Level 3, ES, SF
MLD 12 - ORIGINAL WELLBORE - PROPOSAL #1	6,682.2	7,087.2	109.4	43.7	1.665	CC, ES, SF
WILSON RANCH 30C-27HZ - Wellbore #1 - Design #1	7,563.0	16,444.6	1,931.6	1,644.2	6.720	CC, ES
WILSON RANCH 30C-27HZ - Wellbore #1 - Design #1	7,600.0	16,443.9	1,932.1	1,644.4	6.717	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		Separation Factor		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)	+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	81.09	459.2	2,928.7	2,964.5				
100.0	100.0	146.0	146.0	0.1	1.7	81.09	459.2	2,928.7	2,964.5	2,962.7	1.76	1,683.116	
200.0	200.0	246.0	246.0	0.3	4.0	81.09	459.2	2,928.7	2,964.5	2,960.2	4.27	693.562	
300.0	300.0	346.0	346.0	0.5	6.0	81.09	459.2	2,928.7	2,964.5	2,957.9	6.56	451.869	
400.0	400.0	446.0	446.0	0.8	8.1	81.09	459.2	2,928.7	2,964.5	2,955.7	8.82	336.127	
500.0	500.0	546.0	546.0	1.0	10.1	81.09	459.2	2,928.7	2,964.5	2,953.4	11.07	267.822	
600.0	600.0	646.0	646.0	1.2	12.1	81.09	459.2	2,928.7	2,964.5	2,951.2	13.31	222.667	
700.0	700.0	746.0	746.0	1.4	14.1	81.09	459.2	2,928.7	2,964.5	2,948.9	15.56	190.574	
800.0	800.0	846.0	846.0	1.7	16.1	81.09	459.2	2,928.7	2,964.5	2,946.7	17.80	166.581	
900.0	900.0	946.0	946.0	1.9	18.1	81.09	459.2	2,928.7	2,964.5	2,944.4	20.04	147.962	
1,000.0	1,000.0	1,046.0	1,046.0	2.1	20.2	81.09	459.2	2,928.7	2,964.5	2,942.2	22.27	133.091	
1,100.0	1,100.0	1,146.0	1,146.0	2.3	22.2	81.09	459.2	2,928.7	2,964.5	2,940.0	24.51	120.939	
1,200.0	1,200.0	1,246.0	1,246.0	2.6	24.2	81.09	459.2	2,928.7	2,964.5	2,937.7	26.75	110.822	
1,300.0	1,300.0	1,346.0	1,346.0	2.8	26.2	81.09	459.2	2,928.7	2,964.5	2,935.5	28.99	102.268	
1,400.0	1,400.0	1,446.0	1,446.0	3.0	28.2	81.09	459.2	2,928.7	2,964.5	2,933.2	31.22	94.941	
1,500.0	1,500.0	1,546.0	1,546.0	3.2	30.2	81.09	459.2	2,928.7	2,964.5	2,931.0	33.46	88.594	
1,600.0	1,600.0	1,646.0	1,646.0	3.5	32.2	81.09	459.2	2,928.7	2,964.5	2,928.8	35.70	83.043	
1,700.0	1,700.0	1,746.0	1,746.0	3.7	34.2	81.09	459.2	2,928.7	2,964.5	2,926.5	37.93	78.147	
1,800.0	1,800.0	1,846.0	1,846.0	3.9	36.3	81.09	459.2	2,928.7	2,964.5	2,924.3	40.17	73.796	
1,900.0	1,900.0	1,946.0	1,946.0	4.1	38.3	81.09	459.2	2,928.7	2,964.5	2,922.1	42.41	69.904	
2,000.0	2,000.0	2,046.0	2,046.0	4.4	40.3	81.09	459.2	2,928.7	2,964.5	2,919.8	44.64	66.402	
2,100.0	2,100.0	2,146.0	2,146.0	4.6	42.3	81.09	459.2	2,928.7	2,964.5	2,917.6	46.88	63.235	
2,200.0	2,200.0	2,246.0	2,246.0	4.8	44.3	81.09	459.2	2,928.7	2,964.5	2,915.4	49.12	60.356	
2,300.0	2,300.0	2,346.0	2,346.0	5.0	46.3	81.09	459.2	2,928.7	2,964.5	2,913.1	51.35	57.727	
2,400.0	2,400.0	2,446.0	2,446.0	5.3	48.3	140.39	459.2	2,928.7	2,965.8	2,912.3	53.56	55.371	
2,500.0	2,499.8	2,545.8	2,545.8	5.5	50.3	140.41	459.2	2,928.7	2,969.9	2,914.1	55.72	53.298	
2,600.0	2,599.5	2,645.5	2,645.5	5.7	52.3	140.43	459.2	2,928.7	2,976.6	2,918.7	57.83	51.468	
2,700.0	2,698.7	2,744.7	2,744.7	5.9	54.3	140.46	459.2	2,928.7	2,986.0	2,926.1	59.89	49.857	
2,800.0	2,797.5	2,843.5	2,843.5	6.2	56.3	140.49	459.2	2,928.7	2,998.1	2,936.2	61.89	48.441	
2,900.0	2,895.6	2,941.6	2,941.6	6.4	58.3	140.53	459.2	2,928.7	3,013.0	2,949.1	63.83	47.199	
3,000.0	2,993.1	3,039.1	3,039.1	6.8	60.3	140.57	459.2	2,928.7	3,030.5	2,964.8	65.72	46.116	
3,100.0	3,089.6	3,135.6	3,135.6	7.1	62.2	140.61	459.2	2,928.7	3,050.8	2,983.3	67.53	45.174	
3,200.0	3,185.3	3,231.3	3,231.3	7.5	64.1	140.65	459.2	2,928.7	3,073.8	3,004.5	69.29	44.362	
3,300.0	3,279.8	3,325.8	3,325.8	7.9	66.0	140.69	459.2	2,928.7	3,099.5	3,028.6	70.98	43.667	
3,400.0	3,373.2	3,419.2	3,419.2	8.5	67.9	140.72	459.2	2,928.7	3,128.0	3,055.4	72.61	43.077	
3,500.0	3,465.2	3,511.2	3,511.2	9.0	69.7	140.74	459.2	2,928.7	3,159.2	3,085.0	74.19	42.585	
3,600.0	3,555.8	3,601.8	3,601.8	9.7	71.6	140.75	459.2	2,928.7	3,193.2	3,117.5	75.70	42.180	
3,673.8	3,621.8	3,667.8	3,667.8	10.3	72.9	140.75	459.2	2,928.7	3,220.0	3,143.2	76.79	41.933	
3,700.0	3,645.0	3,691.0	3,691.0	10.5	73.4	140.88	459.2	2,928.7	3,229.8	3,152.5	77.33	41.765	

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