



Project: WELD COUNTY, COLORADO (TRUE)
Site: SW SW SEC. 33 T4N R65W 6th P.M. (CRAWFORD)
Well: CRAWFORD 3N
Vellbore: ORIGINAL WELLBORE
Design: PROPOSAL #2

ANNOTATIONS									
TVD	MD	Inc	Azi	+N/-S	+E/-W	VSec	Departure	Annotation	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	SHL: 314ft FSL & 230ft FWL of Sec 33	
400.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00	START NUDGE (2°/100ft BUR)	
995.62	1000.00	12.00	117.73	-29.13	55.41	-26.19	62.60	EOB TO 12° INC	
3402.14	3460.28	12.00	117.73	-267.15	508.18	-240.22	574.12	END OF TANGENT	
3997.76	4060.28	0.00	0.00	-296.28	563.60	-266.42	636.73	EOD TO VERTICAL	
6425.80	6488.32	0.00	0.00	-296.28	563.60	-266.42	636.73	KOP (8°/100ft BUR)	
7046.05	7238.32	60.00	359.79	61.82	562.29	91.12	994.99	60° INC	
7142.00	7613.31	90.00	359.79	419.91	560.98	448.65	1352.92	EP: 737ft FSL & 790ft FWL of Sec 33	
7142.00	17254.16	90.00	359.80	10060.69	526.54	10074.46	10993.77	BHL: 200ft FNL 790ft FWL of Sec 28	

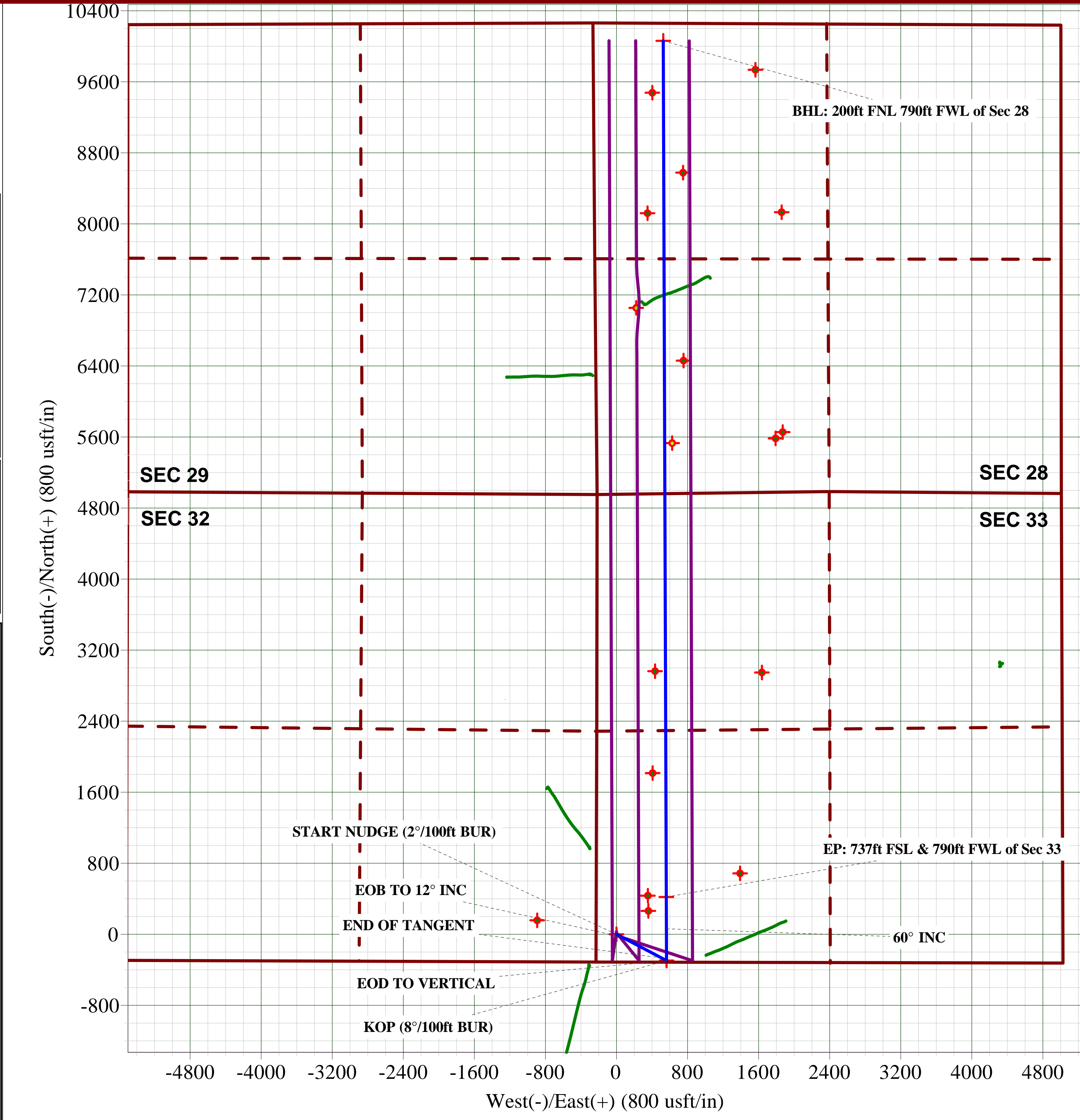
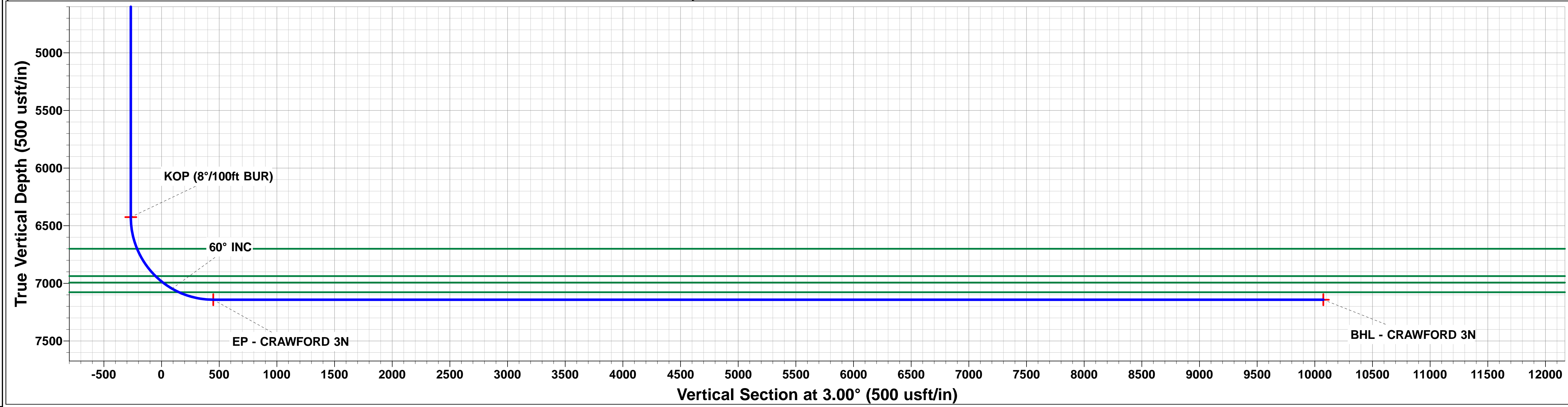
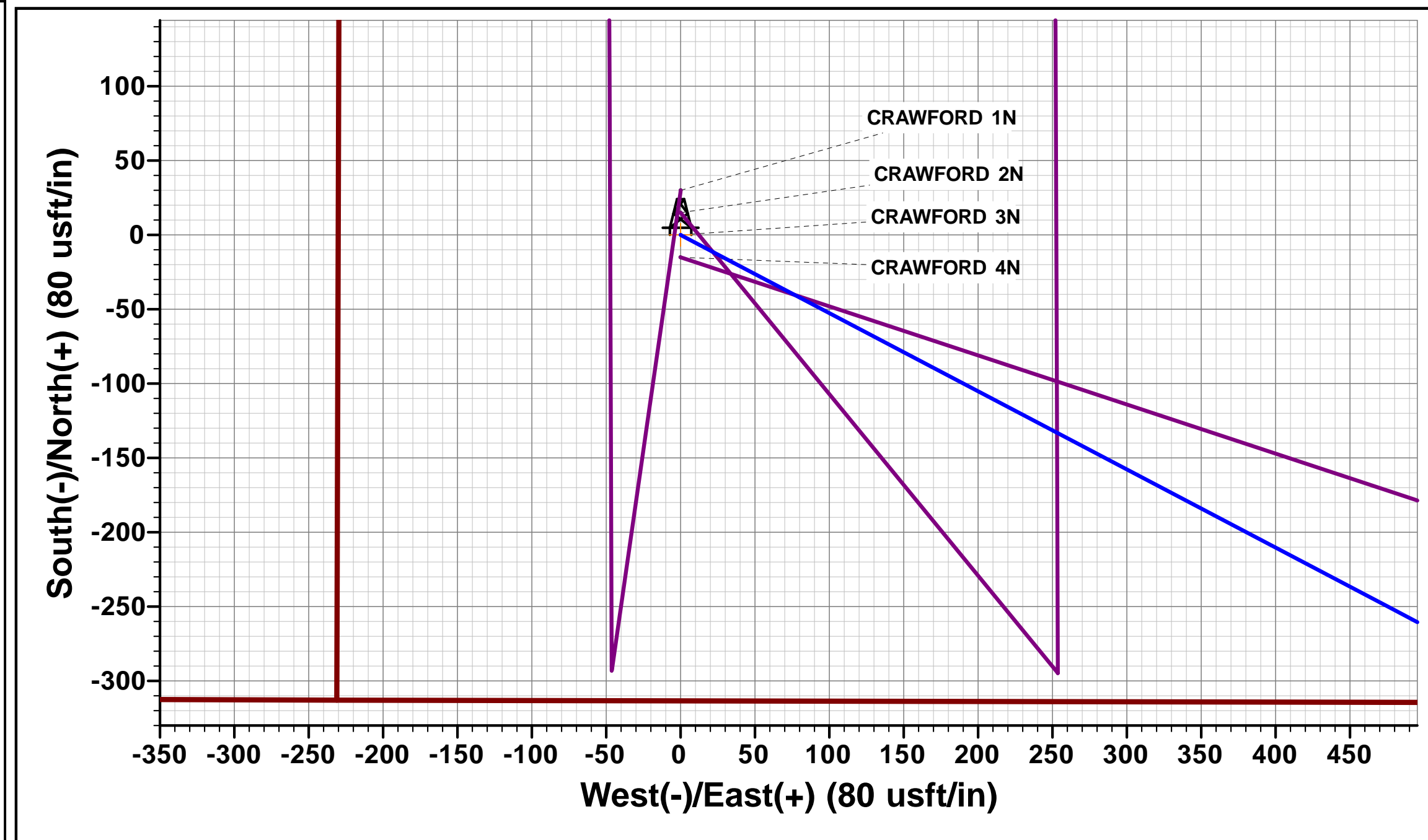
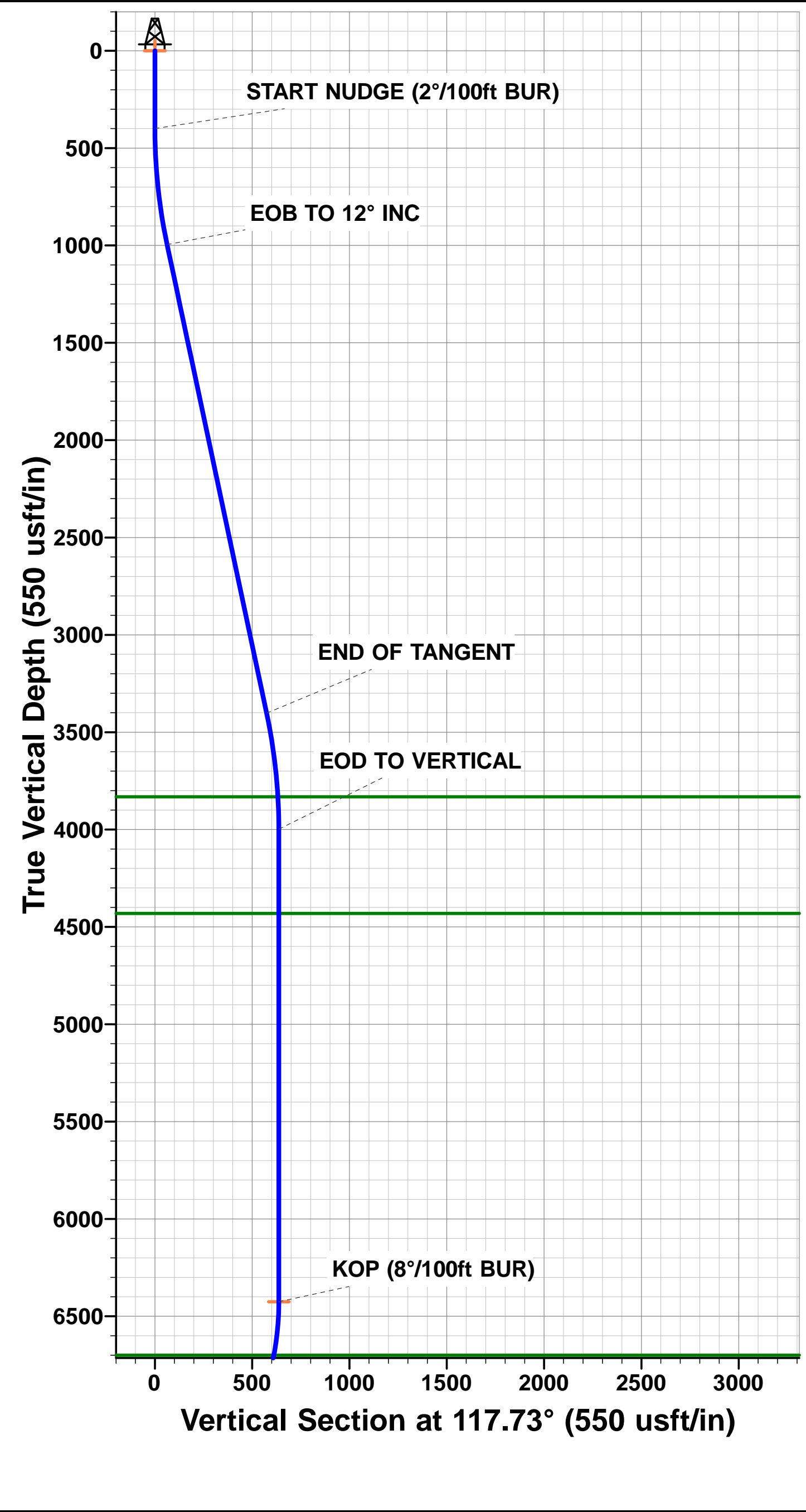
WELLBORE TARGET DETAILS (LAT/LONG)									
Name		TVD	+N/-S	+E/-W	Latitude	Longitude			
KOP - CRAWFORD 3N		6425.80	-296.28	563.60	40.261694	-104.674867			
EP - CRAWFORD 3N		7142.00	419.91	560.98	40.263660	-104.674876			
BHL - CRAWFORD 3N		7142.00	10060.69	526.54	40.290124	-104.674999			
SHL - CRAWFORD 3N		0.00	0.00	0.00	40.262508	-104.676886			

PROPOSED LOCAL COORDINATES:

SHL: 314ft FSL & 230ft FWL Sec 33

EP : 737ft FSL & 790ft FWL Sec 33

BHL: 200ft FNL & 790ft FWL Sec 28



PDC ENERGY

WELD COUNTY, COLORADO (TRUE)

SW SW SEC. 33 T4N R65W 6th P.M. (CRAWFORD)

CRAWFORD 3N

ORIGINAL WELLBORE

PROPOSAL #2

Anticollision Report

01 September, 2018



Anticollision Report



Company:	PDC ENERGY	Local Co-ordinate Reference:	Well CRAWFORD 3N
Project:	WELD COUNTY, COLORADO (TRUE)	TVD Reference:	KB-EST @ 4887.00usft
Reference Site:	SW SW SEC. 33 T4N R65W 6th P.M. (CRAWFORD)	MD Reference:	KB-EST @ 4887.00usft
Site Error:	0.00 usft	North Reference:	True
Reference Well:	CRAWFORD 3N	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	ORIGINAL WELLBORE	Database:	EDM 5000.1 Single User Db
Reference Design:	PROPOSAL #2	Offset TVD Reference:	Offset Datum

Reference	PROPOSAL #2		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	MD + Stations Interval 100.00usft	Error Model:	ISCWSA
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 10,000.00 usft	Error Surface:	Elliptical Conic
Warning Levels Evaluated at:	2.00 Sigma	Casing Method:	Not applied

Survey Tool Program	Date	01/09/2018		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.00	17,254.16	PROPOSAL #2 (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 SE SEC. 33 T4N R65W 6th P.M.						
ABDN VERT BOHLENDER 33-2 - GYRO - Wellbore #1 -	10,194.59	7,050.00	3,760.83	3,700.03	61.854	CC
ABDN VERT BOHLENDER 33-2 - GYRO - Wellbore #1 -	10,300.00	7,050.00	3,762.31	3,699.57	59.964	ES
ABDN VERT BOHLENDER 33-2 - GYRO - Wellbore #1 -	14,700.00	7,050.00	5,868.68	5,722.74	40.215	SF
ABDN VERT KRAUSE 1 - Wellbore #1 - Design #1	12,773.23	4,662.00	2,735.69	2,665.94	39.225	CC
ABDN VERT KRAUSE 1 - Wellbore #1 - Design #1	12,800.00	4,662.00	2,735.82	2,665.79	39.066	ES
ABDN VERT KRAUSE 1 - Wellbore #1 - Design #1	13,900.00	4,662.00	2,958.64	2,876.73	36.119	SF
EXIST DD ANDERSEN 35-33 - Wellbore #1 - Wellbore #	6,785.36	6,779.47	444.80	413.09	14.028	CC
EXIST DD ANDERSEN 35-33 - Wellbore #1 - Wellbore #	6,800.00	6,792.63	444.84	413.08	14.004	ES
EXIST DD ANDERSEN 35-33 - Wellbore #1 - Wellbore #	6,850.00	6,820.00	446.11	414.22	13.989	SF
EXIST DD KRAUSE 22-28 - Wellbore #1 - Wellbore #1	14,595.40	7,151.27	508.07	350.48	3.224	CC
EXIST DD KRAUSE 22-28 - Wellbore #1 - Wellbore #1	14,600.00	7,151.16	508.09	350.42	3.222	ES, SF
EXIST VERT BOHLENDER 33-5 - Wellbore #1 - Design	10,156.50	7,096.02	117.44	43.56	1.590	CC, ES, SF
EXIST VERT BOHLENDER 33-7 - Wellbore #1 - Design	10,137.64	7,096.02	1,085.22	1,011.69	14.758	CC, ES
EXIST VERT BOHLENDER 33-7 - Wellbore #1 - Design	10,400.00	7,096.02	1,116.48	1,038.12	14.247	SF
EXIST VERT HSR KRAUSE 14-28A - Wellbore #1 - Des	12,843.62	7,096.02	1,329.13	1,204.79	10.690	CC, ES
EXIST VERT HSR KRAUSE 14-28A - Wellbore #1 - Des	13,100.00	7,096.02	1,353.63	1,224.42	10.476	SF
EXIST VERT HSR MONTALI 14-33 - Wellbore #1 - Desig	7,876.18	7,096.00	831.58	794.96	22.710	CC, ES
EXIST VERT HSR MONTALI 14-33 - Wellbore #1 - Desig	8,100.00	7,096.00	861.18	821.90	21.927	SF
EXIST VERT HSR-HART 12-33 - Wellbore #1 - Design #	9,009.01	7,096.01	149.48	96.10	2.800	CC, ES, SF
EXIST VERT HSR-LEE 13-33 - Wellbore #1 - Design #1	7,628.56	7,096.00	207.50	173.20	6.050	CC, ES, SF
EXIST VERT KRAUSE 1-J - Wellbore #1 - Design #1	13,652.65	7,096.02	215.89	76.15	1.545	CC, ES, SF
EXIST VERT OGG 21-28 - Wellbore #1 - Design #1	16,924.94	7,096.00	1,036.38	834.09	5.123	CC, ES
EXIST VERT OGG 21-28 - Wellbore #1 - Design #1	17,000.00	7,096.00	1,039.09	835.36	5.100	SF
EXIST VERT OGG 22-28 - Wellbore #1 - Design #1	15,320.24	7,096.01	1,326.01	1,154.44	7.729	CC, ES
EXIST VERT OGG 22-28 - Wellbore #1 - Design #1	15,500.00	7,096.01	1,338.14	1,163.13	7.646	SF
EXIST VERT PEARSON 1 - Wellbore #1 - Design #1	15,769.27	7,096.01	217.73	37.57	1.209	Level 2, CC, ES, SF
EXIST VERT UPRR 36 PAN AM C #1 - Wellbore #1 - De	1,638.33	1,574.01	400.00	391.47	46.897	CC
EXIST VERT UPRR 36 PAN AM C #1 - Wellbore #1 - De	1,700.00	1,634.33	400.21	391.27	44.763	ES
EXIST VERT UPRR 36 PAN AM C #1 - Wellbore #1 - De	4,800.00	4,691.48	595.69	571.99	25.137	SF

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

Anticollision Report



Company:	PDC ENERGY	Local Co-ordinate Reference:	Well CRAWFORD 3N
Project:	WELD COUNTY, COLORADO (TRUE)	TVD Reference:	KB-EST @ 4887.00usft
Reference Site:	SW SW SEC. 33 T4N R65W 6th P.M. (CRAWFORD)	MD Reference:	KB-EST @ 4887.00usft
Site Error:	0.00 usft	North Reference:	True
Reference Well:	CRAWFORD 3N	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	ORIGINAL WELLBORE	Database:	EDM 5000.1 Single User Db
Reference Design:	PROPOSAL #2	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
SW SW SEC. 33 T4N R65W 6th P.M. (CRAWFORD)						
CRAWFORD 1N - ORIGINAL WELLBORE - PROPOSAL	400.00	398.00	30.02	28.50	19.786	CC, ES
CRAWFORD 1N - ORIGINAL WELLBORE - PROPOSAL	17,254.16	17,214.25	610.16	223.26	1.577	SF
CRAWFORD 2N - ORIGINAL WELLBORE - PROPOSAL	400.00	399.00	15.01	13.49	9.878	CC
CRAWFORD 2N - ORIGINAL WELLBORE - PROPOSAL	17,254.16	17,132.71	324.43	-45.97	0.876	Level 1, ES, SF
CRAWFORD 4N - ORIGINAL WELLBORE - PROPOSAL	266.33	267.33	14.97	14.05	16.222	CC
CRAWFORD 4N - ORIGINAL WELLBORE - PROPOSAL	17,254.16	17,188.89	307.73	-64.19	0.827	Level 1, ES, SF
EXIST DD RAY 39-32 - Wellbore #1 - Wellbore #1	8,175.30	7,250.80	862.97	819.58	19.891	CC, ES
EXIST DD RAY 39-32 - Wellbore #1 - Wellbore #1	8,400.00	7,251.94	891.74	845.13	19.131	SF
EXIST DD REI 26-5 - Wellbore #1 - Wellbore #1	5,855.90	6,193.09	874.35	824.40	17.504	CC, ES
EXIST DD REI 26-5 - Wellbore #1 - Wellbore #1	6,650.00	6,989.58	878.29	826.46	16.944	SF
EXIST DD SPAYD 39-29 - Wellbore #1 - Wellbore #1	13,503.37	7,269.39	830.87	693.51	6.049	CC, ES
EXIST DD SPAYD 39-29 - Wellbore #1 - Wellbore #1	13,600.00	7,268.78	836.47	697.28	6.009	SF
EXIST VERT HSR-KOCH 16-32 - Wellbore #1 - Design #	400.00	404.00	906.35	904.81	589.966	CC, ES
EXIST VERT HSR-KOCH 16-32 - Wellbore #1 - Design #	8,600.00	7,146.01	1,914.33	1,867.61	40.971	SF
EXIST VERT KRAUSE 12-28 - Wellbore #1 - Design #1	14,248.35	7,146.02	314.92	163.71	2.083	CC, ES, SF
EXIST VERT KRAUSE 2-28 - WELL - Design #1	12,724.14	7,146.02	84.26	-37.93	0.690	Level 1, CC, ES, SF
EXIST VERT OGG 11-28 - Wellbore #1 - Design #1	16,670.31	7,146.01	125.06	-72.47	0.633	Level 1, CC, ES, SF
EXIST VERT OGG 5-28 - Wellbore #1 - Design #1	15,314.21	7,146.01	184.50	12.92	1.075	Level 2, CC, ES, SF

Offset Design SW SE SEC. 33 T4N R65W 6th P.M. - ABDN VERT BOHLENDER 33-2 - GYRO - Wellbore #1 - Wellbo												Offset Site Error:	0.00 usft
Survey Program: 100-GYD_CT												Offset Well Error:	0.00 usft
Reference Measured Depth (usft)	Vertical Depth (usft)	Offset Measured Depth (usft)	Vertical Depth (usft)	Semi Major Axis Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
0.00	0.00	0.00	0.00	0.00	0.00	54.94	3,050.47	4,346.64	5,310.44				
100.00	100.00	49.93	49.93	0.09	0.04	54.94	3,050.54	4,346.61	5,310.26	5,310.13	0.13	N/A	
200.00	200.00	151.09	151.09	0.31	0.16	54.93	3,051.02	4,346.41	5,310.37	5,309.90	0.47	N/A	
300.00	300.00	265.85	265.85	0.54	0.25	54.93	3,051.16	4,346.21	5,310.30	5,309.51	0.79	6,736.497	
400.00	400.00	407.47	407.46	0.76	0.35	54.93	3,050.59	4,345.59	5,309.71	5,308.61	1.11	4,801.065	
500.00	499.98	500.00	499.99	0.97	0.41	-62.85	3,050.06	4,344.94	5,308.02	5,306.64	1.37	3,864.078	
600.00	599.84	593.53	593.52	1.17	0.46	-62.95	3,049.76	4,344.28	5,304.86	5,303.23	1.63	3,247.510	
700.00	699.45	712.87	712.86	1.40	0.52	-63.14	3,049.29	4,343.24	5,299.95	5,298.02	1.93	2,746.197	
800.00	798.70	813.56	813.53	1.67	0.57	-63.38	3,048.67	4,342.27	5,293.30	5,291.05	2.25	2,354.936	
900.00	897.47	910.80	910.77	1.99	0.62	-63.68	3,048.11	4,341.31	5,285.10	5,282.50	2.60	2,032.342	
1,000.00	995.62	1,000.00	999.97	2.35	0.66	-64.01	3,047.58	4,340.55	5,275.52	5,272.52	2.99	1,761.516	
1,100.00	1,093.44	1,086.57	1,086.53	2.76	0.70	-64.19	3,047.20	4,339.93	5,265.42	5,262.01	3.41	1,543.300	
1,200.00	1,191.25	1,190.11	1,190.07	3.19	0.74	-64.41	3,047.07	4,339.03	5,255.46	5,251.61	3.85	1,364.742	
1,300.00	1,289.07	1,287.92	1,287.87	3.62	0.78	-64.62	3,047.11	4,337.95	5,245.48	5,241.18	4.30	1,220.488	
1,400.00	1,386.88	1,400.00	1,399.94	4.06	0.83	-64.86	3,046.97	4,336.66	5,235.43	5,230.67	4.76	1,100.368	
1,500.00	1,484.70	1,470.45	1,470.39	4.51	0.85	-65.01	3,046.88	4,335.94	5,225.55	5,220.35	5.20	1,004.666	
1,600.00	1,582.51	1,579.80	1,579.73	4.96	0.89	-65.24	3,047.10	4,335.01	5,216.09	5,210.43	5.66	921.073	
1,700.00	1,680.33	1,684.99	1,684.92	5.41	0.93	-65.47	3,046.98	4,333.85	5,206.30	5,200.17	6.13	848.993	
1,800.00	1,778.14	1,800.00	1,799.92	5.86	0.98	-65.72	3,046.88	4,332.29	5,196.40	5,189.79	6.61	786.354	
1,900.00	1,875.96	1,875.67	1,875.57	6.32	1.01	-65.89	3,047.16	4,331.01	5,186.60	5,179.53	7.07	734.000	
2,000.00	1,973.77	1,971.63	1,971.52	6.78	1.04	-66.11	3,047.96	4,329.44	5,177.18	5,169.64	7.53	687.490	
2,100.00	2,071.59	2,067.03	2,066.89	7.24	1.07	-66.33	3,048.98	4,327.61	5,167.77	5,159.78	8.00	646.274	
2,200.00	2,169.40	2,158.96	2,158.81	7.70	1.11	-66.55	3,050.09	4,325.87	5,158.56	5,150.09	8.46	609.661	
2,300.00	2,267.22	2,242.83	2,242.65	8.16	1.13	-66.75	3,051.28	4,324.29	5,149.57	5,140.64	8.92	577.098	
2,400.00	2,365.03	2,324.18	2,323.97	8.62	1.16	-66.94	3,052.83	4,322.83	5,141.01	5,131.62	9.38	547.937	

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