



Project: WELD COUNTY, COLORADO
Site: SE SE SEC. 32 T4N R65W 6th P.M. (CRAWFORD)
Well: CRAWFORD 3N
Wellbore: ORIGINAL WELLBORE
Design: PROPOSAL #1

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: 93ft FEL & 376ft FSL of Sec 32
200.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00	START NUDGE (2°/100ft BUR)
795.73	800.11	12.00	112.09	-23.55	58.03	-18.56	62.62	EOB TO 12° INC
4705.07	4796.82	12.00	112.09	-336.14	828.11	-264.86	893.73	END OF TANGENT
5300.80	5396.93	0.00	0.00	-359.69	886.14	-283.42	956.36	EOD TO VERTICAL
6434.80	6530.93	0.00	0.00	-359.69	886.14	-283.42	956.36	KOP (8°/100ft BUR)
7151.00	7655.92	90.00	359.79	356.50	883.52	429.98	1672.55	EP: 790ft FWL & 737ft FSL of Sec 33
7151.00	17296.77	90.00	359.80	9997.28	848.95	10033.26	11313.40	BHL: 790ft FWL & 200ft FNL of Sec 28

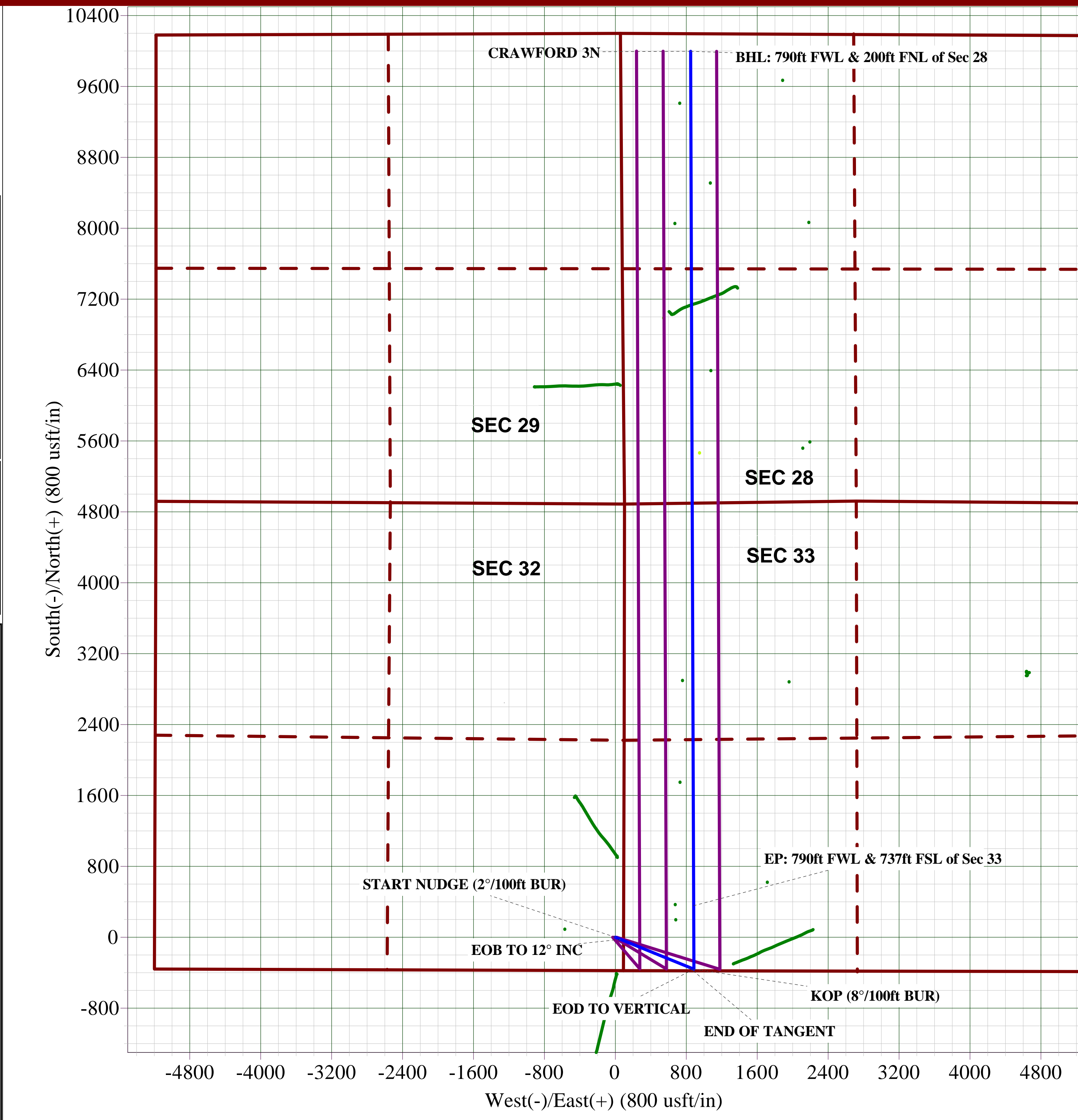
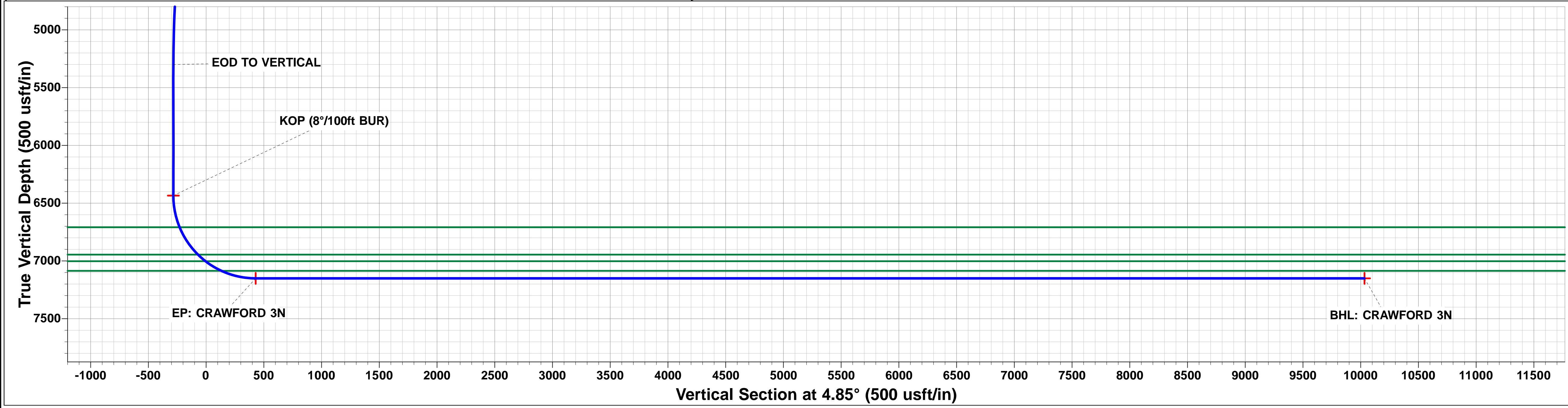
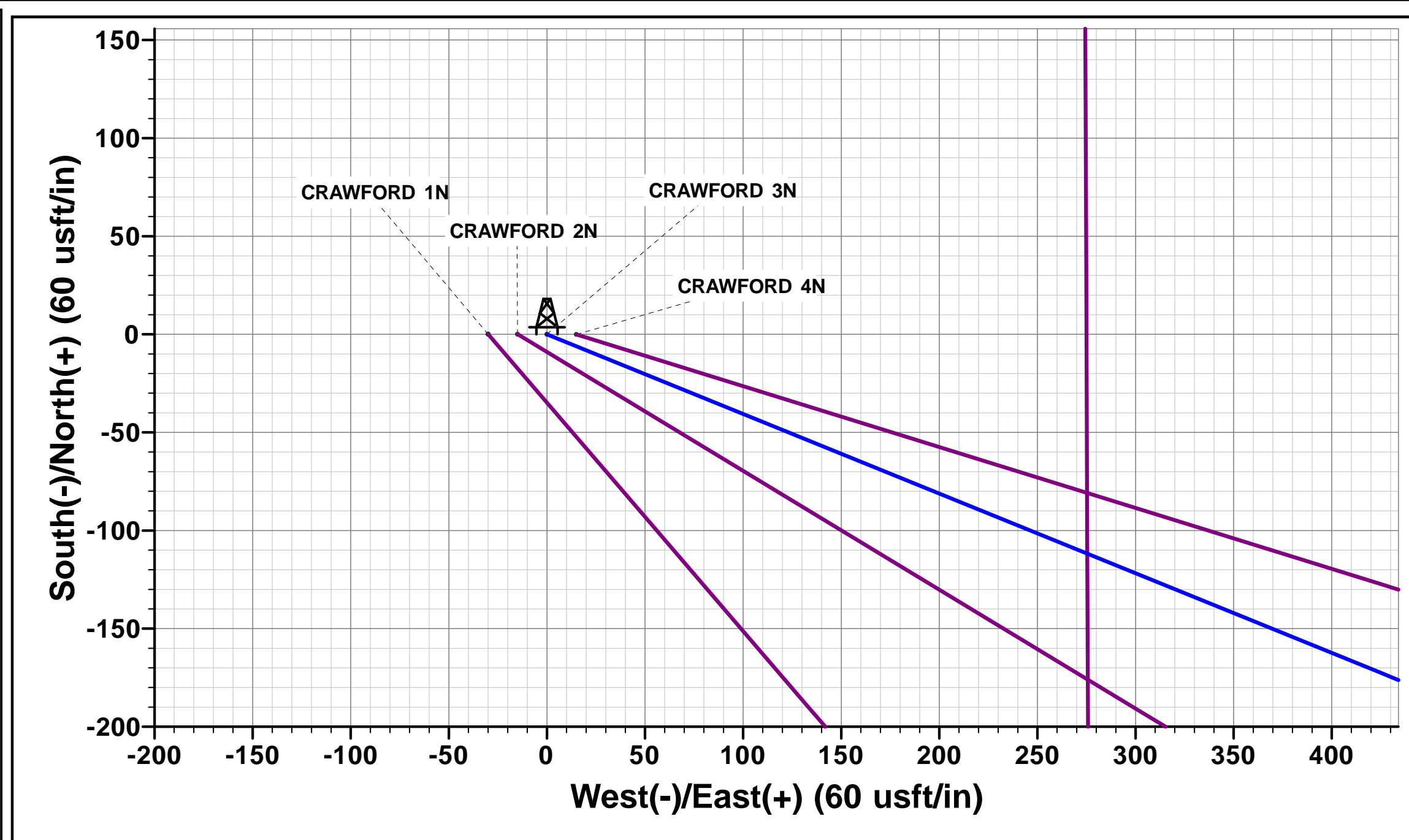
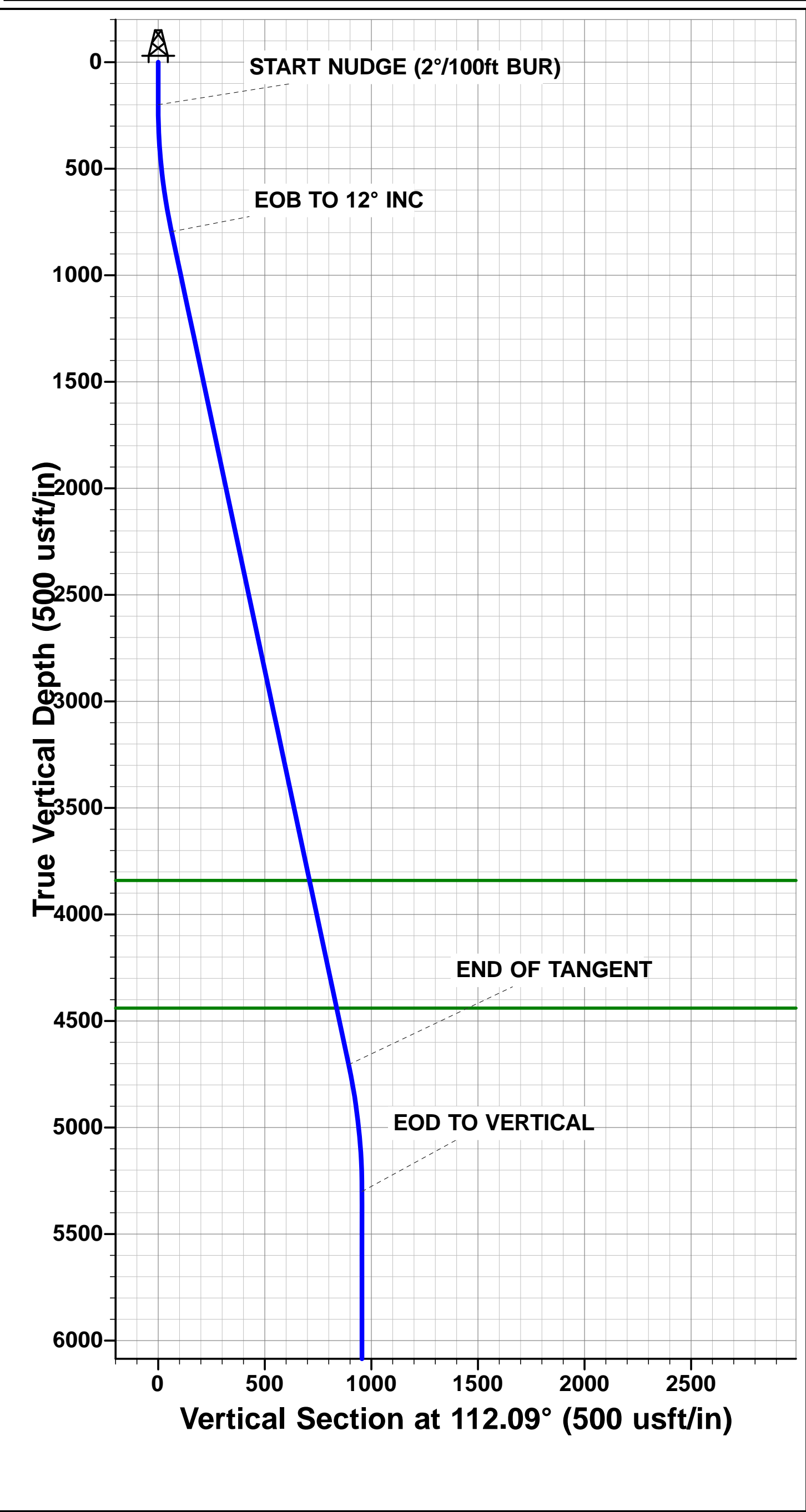
PROPOSED LOCAL COORDINATES:

SHL: 93ft FEL & 376ft FSL of Sec 32

EP: 790ft FWL & 737ft FSL of Sec 33

BHL: 790ft FWL & 200ft FNL of Sec 28

WELLBORE TARGET DETAILS (LAT/LONG)					
Name	TVD	+N/-S	+E/-W	Latitude	Longitude
KOP: CRAWFORD 3N	6434.80	-359.69	886.14	40.261694	-104.674867
EP: CRAWFORD 3N	7151.00	356.50	883.52	40.263660	-104.674876
BHL: CRAWFORD 3N	7151.00	9997.28	848.95	40.290124	-104.674999



PDC ENERGY

WELD COUNTY, COLORADO

SE SE SEC. 32 T4N R65W 6th P.M. (CRAWFORD)

CRAWFORD 3N

ORIGINAL WELLBORE

PROPOSAL #1

Anticollision Report

06 December, 2017



Company:	PDC ENERGY	Local Co-ordinate Reference:	Well CRAWFORD 3N
Project:	WELD COUNTY, COLORADO	TVD Reference:	WELL @ 4896.00usft (Original Well Elev)
Reference Site:	SE SE SEC. 32 T4N R65W 6th P.M. (CRAWFORD)	MD Reference:	WELL @ 4896.00usft (Original Well Elev)
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 #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 100.00usft	Error Model:	ISCWSA
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 9,999.98 usft	Error Surface:	Elliptical Conic
Warning Levels Evaluated at:	2.00 Sigma	Casing Method:	Not applied

Survey Tool Program	Date	06/12/2017		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.00	17,296.77	PROPOSAL #1 (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						
SE SE SEC. 32 T4N R65W 6th P.M. (CRAWFORD)						
CRAWFORD 1N - ORIGINAL WELLBORE - PROPOSAL	200.00	200.00	29.97	29.35	48.143	CC, ES
CRAWFORD 1N - ORIGINAL WELLBORE - PROPOSAL	17,296.77	17,240.35	610.16	224.96	1.584	SF
CRAWFORD 2N - ORIGINAL WELLBORE - PROPOSAL	200.00	200.00	14.99	14.36	24.072	CC
CRAWFORD 2N - ORIGINAL WELLBORE - PROPOSAL	17,296.77	17,171.17	324.43	-45.54	0.877	Level 1, ES, SF
CRAWFORD 4N - ORIGINAL WELLBORE - PROPOSAL	100.00	100.00	15.02	14.84	86.757	CC
CRAWFORD 4N - ORIGINAL WELLBORE - PROPOSAL	17,296.77	17,234.63	307.73	-62.54	0.831	Level 1, ES, SF
EXIST DD RAY 39-32 - Wellbore #1 - Wellbore #1	8,217.91	7,250.80	862.97	819.60	19.900	CC, ES
EXIST DD RAY 39-32 - Wellbore #1 - Wellbore #1	8,500.00	7,252.23	907.90	860.70	19.232	SF
EXIST DD REI 26-5 - Wellbore #1 - Wellbore #1	5,898.86	6,193.39	874.35	822.61	16.897	CC
EXIST DD REI 26-5 - Wellbore #1 - Wellbore #1	5,900.00	6,194.36	874.35	822.60	16.896	ES
EXIST DD REI 26-5 - Wellbore #1 - Wellbore #1	6,700.00	6,996.72	878.39	824.90	16.423	SF
EXIST DD SPAYD 39-29 - Wellbore #1 - Wellbore #1	13,545.98	7,269.39	830.87	694.67	6.100	CC, ES
EXIST DD SPAYD 39-29 - Wellbore #1 - Wellbore #1	13,600.00	7,269.05	832.63	695.40	6.068	SF
EXIST VERT HSR-KOCH 16-32 - Wellbore #1 - Design #	200.00	195.00	577.74	577.12	936.396	CC, ES
EXIST VERT HSR-KOCH 16-32 - Wellbore #1 - Design #	8,500.00	7,146.01	1,824.84	1,780.63	41.274	SF
EXIST VERT KRAUSE 12-28 - Wellbore #1 - Design #1	14,290.96	7,146.02	314.92	164.92	2.099	CC
EXIST VERT KRAUSE 12-28 - Wellbore #1 - Design #1	14,300.00	7,146.02	315.05	164.87	2.098	ES, SF
EXIST VERT KRAUSE 2-28 - WELL - Design #1	12,766.75	7,146.02	84.26	-36.78	0.696	Level 1, CC, ES, SF
EXIST VERT OGG 11-28 - Wellbore #1 - Design #1	16,712.92	7,146.01	125.06	-71.22	0.637	Level 1, CC, ES, SF
EXIST VERT OGG 5-28 - Wellbore #1 - Design #1	15,356.83	7,146.01	184.50	14.15	1.083	Level 2, CC, ES, SF

Company:	PDC ENERGY	Local Co-ordinate Reference:	Well CRAWFORD 3N
Project:	WELD COUNTY, COLORADO	TVD Reference:	WELL @ 4896.00usft (Original Well Elev)
Reference Site:	SE SE SEC. 32 T4N R65W 6th P.M. (CRAWFORD)	MD Reference:	WELL @ 4896.00usft (Original Well Elev)
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 #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
SW SE SEC. 33 T4N R65W 6th P.M. (LORY)						
ABDN VERT BOHLENDER 33-2 - GYRO - Wellbore #1 -	10,237.21	7,050.00	3,760.83	3,700.95	62.799	CC
ABDN VERT BOHLENDER 33-2 - GYRO - Wellbore #1 -	10,300.00	7,050.00	3,761.36	3,700.33	61.629	ES
ABDN VERT BOHLENDER 33-2 - GYRO - Wellbore #1 -	14,800.00	7,050.00	5,912.85	5,767.02	40.548	SF
ABDN VERT KRAUSE 1 - Wellbore #1 - Design #1	12,815.84	4,662.00	2,735.69	2,665.37	38.907	CC, ES
ABDN VERT KRAUSE 1 - Wellbore #1 - Design #1	14,000.00	4,662.00	2,980.97	2,897.90	35.884	SF
EXIST DD ANDERSEN 35-33 - Wellbore #1 - Wellbore #	6,827.97	6,779.47	444.80	411.75	13.458	CC, ES
EXIST DD ANDERSEN 35-33 - Wellbore #1 - Wellbore #	6,850.00	6,799.23	444.90	411.82	13.448	SF
EXIST DD KRAUSE 22-28 - Wellbore #1 - Wellbore #1	14,638.02	7,151.27	508.07	351.64	3.248	CC, ES
EXIST DD KRAUSE 22-28 - Wellbore #1 - Wellbore #1	14,700.00	7,149.77	511.83	354.24	3.248	SF
EXIST VERT BOHLENDER 33-5 - Wellbore #1 - Design	10,199.12	7,096.02	117.44	44.49	1.610	CC
EXIST VERT BOHLENDER 33-5 - Wellbore #1 - Design	10,200.00	7,096.02	117.44	44.47	1.609	ES, SF
EXIST VERT BOHLENDER 33-7 - Wellbore #1 - Design	10,180.26	7,096.02	1,085.22	1,012.61	14.945	CC
EXIST VERT BOHLENDER 33-7 - Wellbore #1 - Design	10,200.00	7,096.02	1,085.40	1,012.43	14.874	ES
EXIST VERT BOHLENDER 33-7 - Wellbore #1 - Design	10,500.00	7,096.02	1,131.34	1,052.88	14.419	SF
EXIST VERT HSR KRAUSE 14-28A - Wellbore #1 - Des	12,886.23	7,096.02	1,329.13	1,205.95	10.790	CC
EXIST VERT HSR KRAUSE 14-28A - Wellbore #1 - Des	12,900.00	7,096.02	1,329.20	1,205.76	10.768	ES
EXIST VERT HSR KRAUSE 14-28A - Wellbore #1 - Des	13,200.00	7,096.02	1,365.66	1,236.53	10.575	SF
EXIST VERT HSR MONTALI 14-33 - Wellbore #1 - Desig	7,918.79	7,096.00	831.58	794.61	22.492	CC, ES
EXIST VERT HSR MONTALI 14-33 - Wellbore #1 - Desig	8,100.00	7,096.00	851.10	812.25	21.911	SF
EXIST VERT HSR-HART 12-33 - Wellbore #1 - Design #	9,051.67	7,096.01	149.48	96.70	2.832	CC, ES, SF
EXIST VERT HSR-LEE 13-33 - Wellbore #1 - Design #1	7,671.16	7,096.00	207.50	172.61	5.948	CC, ES, SF
EXIST VERT KRAUSE 1-J - Wellbore #1 - Design #1	13,695.26	7,096.02	215.89	77.34	1.558	CC
EXIST VERT KRAUSE 1-J - Wellbore #1 - Design #1	13,700.00	7,096.02	215.94	77.30	1.558	ES, SF
EXIST VERT OGG 21-28 - Wellbore #1 - Design #1	16,967.55	7,096.00	1,036.38	835.34	5.155	CC
EXIST VERT OGG 21-28 - Wellbore #1 - Design #1	17,000.00	7,096.00	1,036.89	835.23	5.142	ES
EXIST VERT OGG 21-28 - Wellbore #1 - Design #1	17,100.00	7,096.00	1,044.81	841.23	5.132	SF
EXIST VERT OGG 22-28 - Wellbore #1 - Design #1	15,362.85	7,096.01	1,326.01	1,155.67	7.784	CC
EXIST VERT OGG 22-28 - Wellbore #1 - Design #1	15,400.00	7,096.01	1,326.53	1,155.48	7.755	ES
EXIST VERT OGG 22-28 - Wellbore #1 - Design #1	15,600.00	7,096.01	1,347.05	1,172.18	7.703	SF
EXIST VERT PEARSON 1 - Wellbore #1 - Design #1	15,811.84	7,096.01	217.73	38.81	1.217	Level 2, CC, ES, SF
EXIST VERT UPRR 36 PAN AM C #1 - Wellbore #1 - De	3,174.53	3,063.24	441.43	421.78	22.468	CC
EXIST VERT UPRR 36 PAN AM C #1 - Wellbore #1 - De	3,200.00	3,088.16	441.46	421.64	22.276	ES
EXIST VERT UPRR 36 PAN AM C #1 - Wellbore #1 - De	4,200.00	4,066.30	490.24	464.77	19.249	SF

Offset Design		SE SE SEC. 32 T4N R65W 6th P.M. (CRAWFORD) - CRAWFORD 1N - ORIGINAL WELLBORE - PRO											Offset Site Error:	0.00 usft
Survey Program: 0-MWD													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance							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		
0.00	0.00	0.00	0.00	0.00	0.00	-89.86	0.07	-29.97	29.97					
100.00	100.00	100.00	100.00	0.09	0.09	-89.86	0.07	-29.97	29.97	29.80	0.17	173.190		
200.00	200.00	200.00	200.00	0.31	0.31	-89.86	0.07	-29.97	29.97	29.35	0.62	48.143	CC, ES	
300.00	299.98	299.98	299.98	0.52	0.54	159.22	0.07	-29.97	31.60	30.54	1.06	29.716		
400.00	399.84	399.84	399.84	0.74	0.76	162.10	0.07	-29.97	36.54	35.03	1.51	24.231		
500.00	499.45	500.59	500.57	0.99	0.96	163.97	-1.27	-28.82	43.63	41.69	1.94	22.525		
600.00	598.70	601.49	601.33	1.28	1.17	163.65	-5.30	-25.36	51.52	49.16	2.36	21.804		
700.00	697.47	702.51	701.95	1.62	1.40	162.02	-12.03	-19.58	60.23	57.40	2.83	21.320		
800.00	795.62	803.60	802.27	2.01	1.66	159.61	-21.46	-11.48	69.84	66.50	3.34	20.924		
800.11	795.73	803.71	802.37	2.01	1.67	159.61	-21.47	-11.47	69.85	66.51	3.34	20.924		

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