

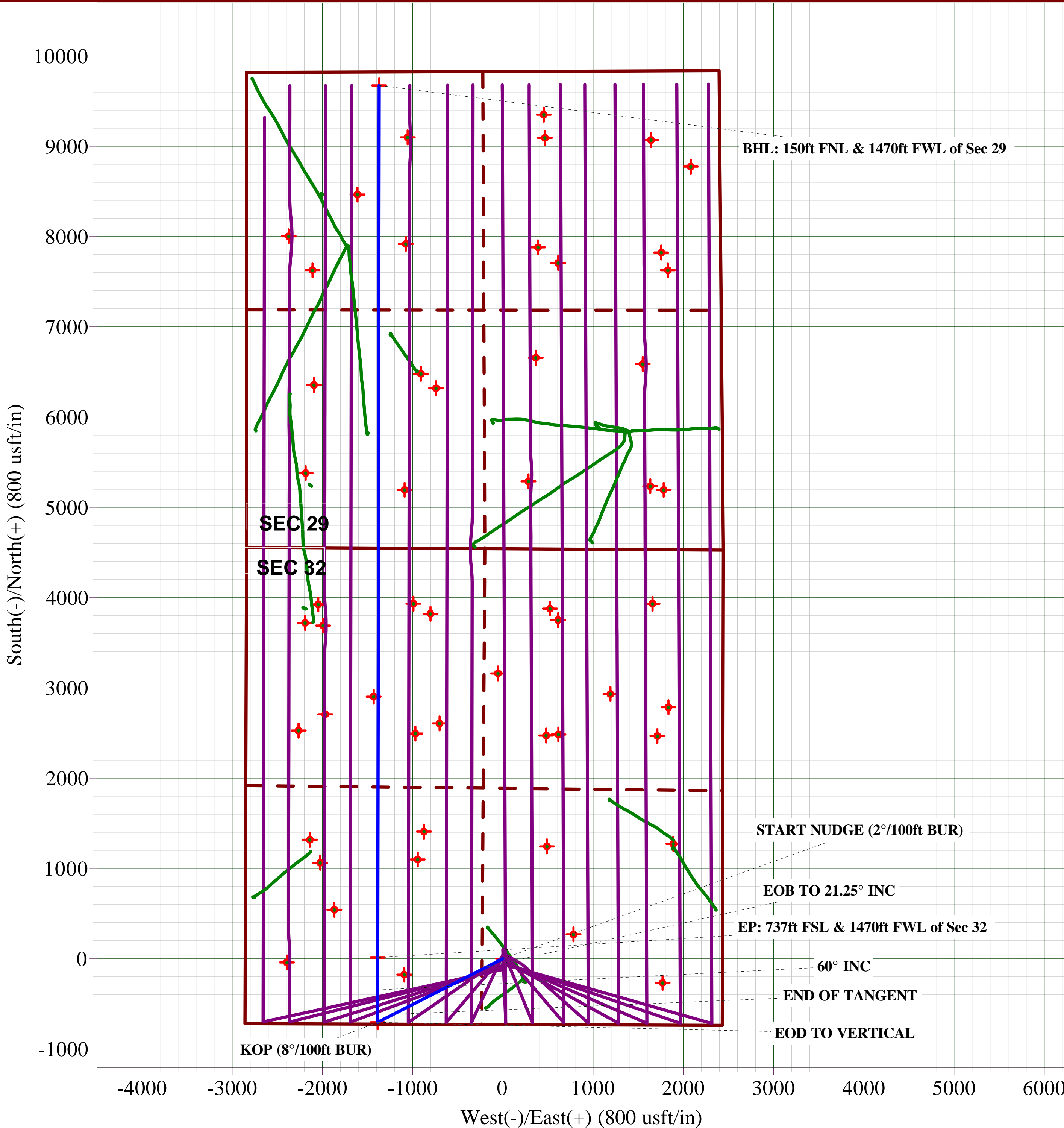
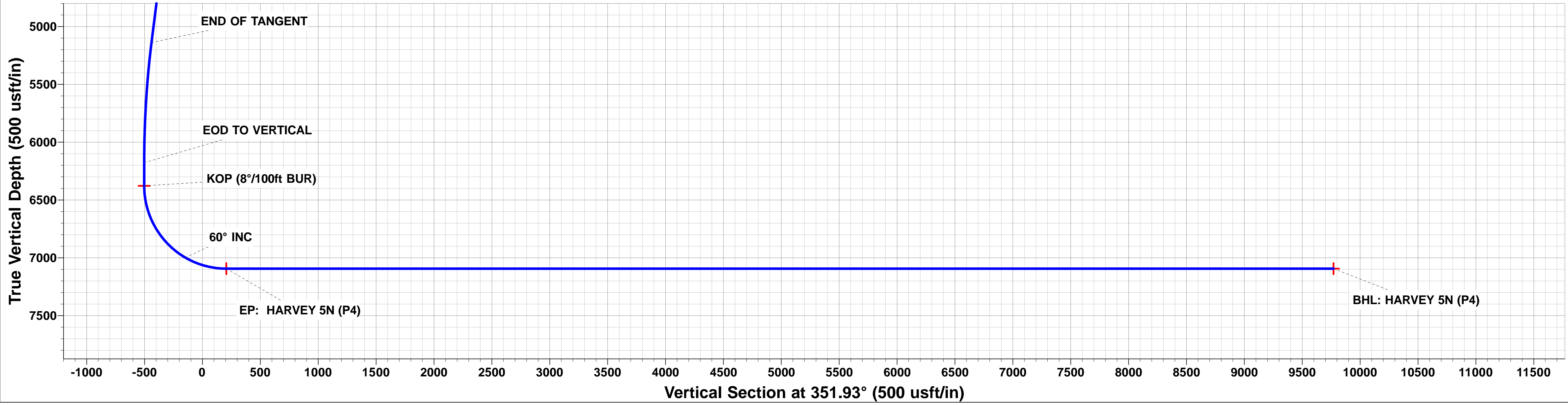
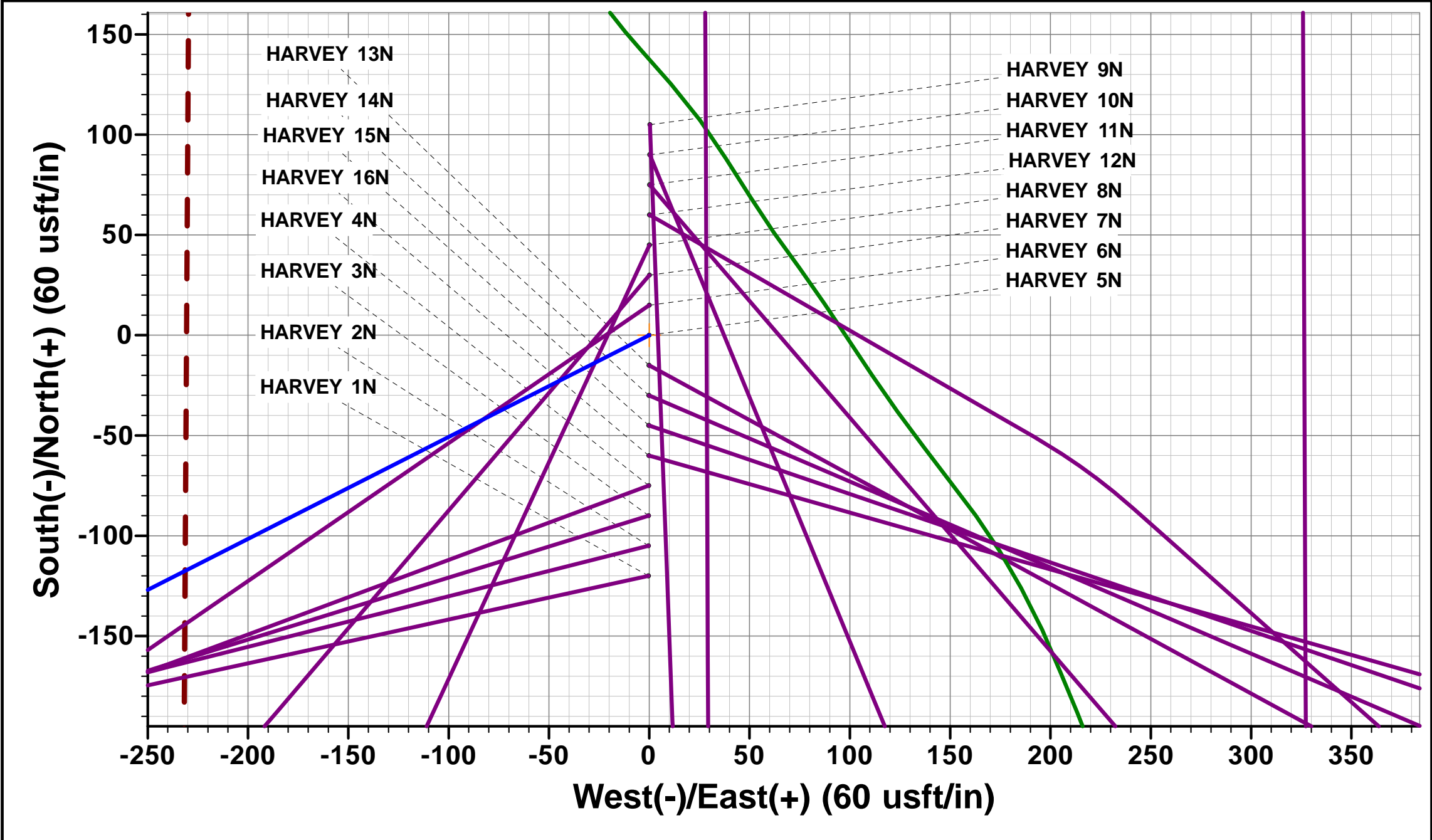
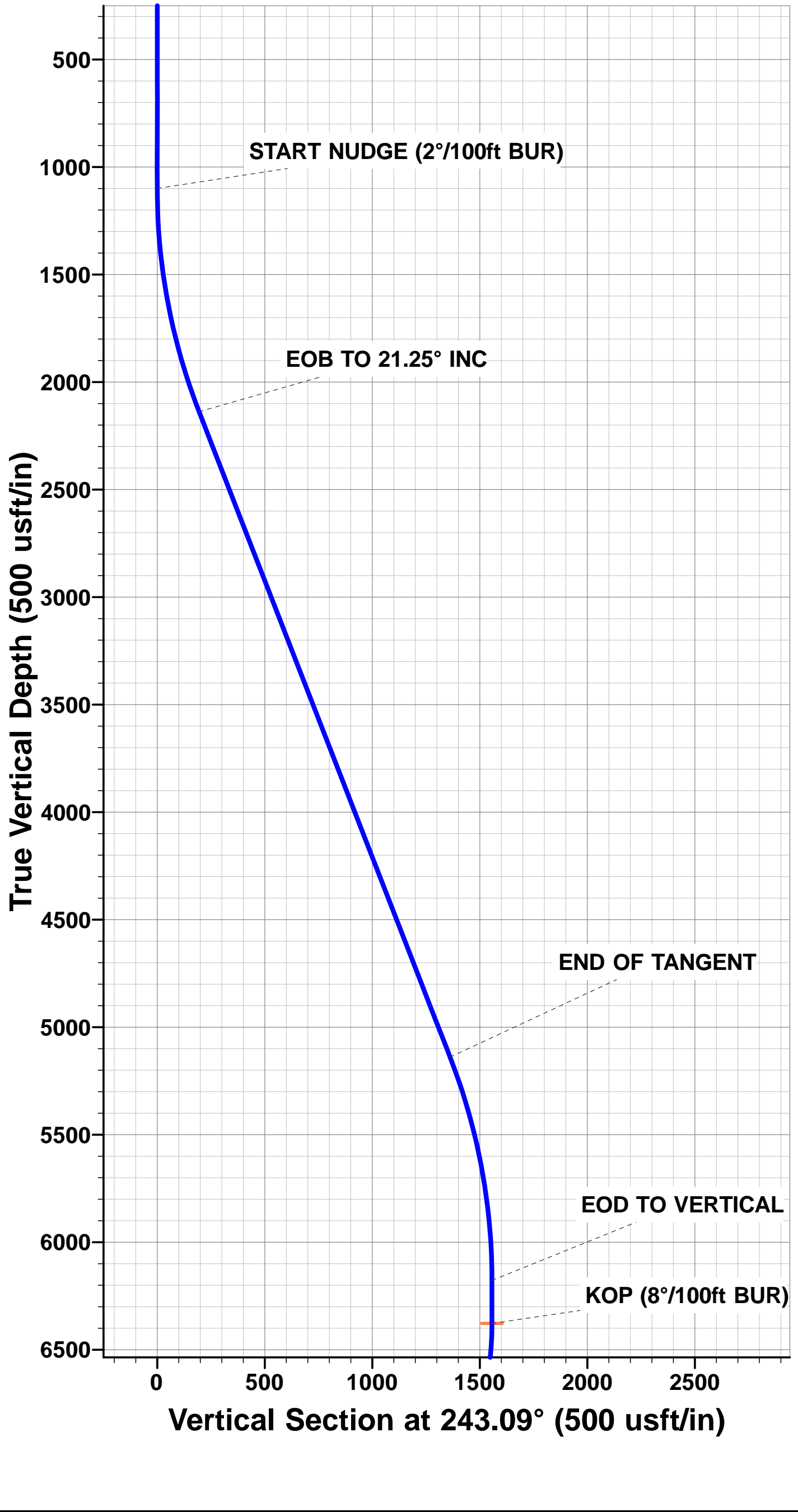


Project: WELD COUNTY, COLORADO (TRUE)  
Site: SW SE SEC. 32 T4N R65W 6th P.M. (HARVEY)  
Well: HARVEY 5N  
Wellbore: ORIGINAL WELLBORE  
Design: PROPOSAL #4

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: 730ft FSL & 2434ft FEL of Sec 32	
1100.00	1100.00	0.00	0.00	0.00	0.00	0.00	0.00	START NUDGE (2°/100ft BUR)	
2138.38	2162.58	21.25	243.09	-88.16	-173.72	-62.91	194.81	EOB TO 21.25° INC	
5139.42	5382.58	21.25	243.09	-616.36	-1214.49	-439.80	1361.95	END OF TANGENT	
6177.80	6445.16	0.00	0.00	-704.53	-1388.21	-502.71	1556.76	EOD TO VERTICAL	
6377.80	6645.16	0.00	0.00	-704.53	-1388.21	-502.71	1556.76	KOP (8°/100ft BUR)	
6998.05	7395.16	60.00	0.09	-346.43	-1387.65	-148.24	1914.93	60° INC	
7094.00	7770.16	90.00	0.09	11.66	-1387.09	206.23	2272.95	EP: 737ft FSL & 1470ft FWL of Sec 32	
7094.00	17431.85	90.00	0.10	9673.34	-1371.27	9770.05	11934.64	BHL: 150ft FNL & 1470ft FWL of Sec 29	

PROPOSED LOCAL COORDINATES:  
  
SHL: 730ft FSL & 2434ft FEL Sec 32  
  
EP : 737ft FSL & 1470ft FWL Sec 32  
  
BHL: 150ft FNL & 1470ft FWL Sec 29

WELLBORE TARGET DETAILS (LAT/LONG)					
Name	TVD	+N/-S	+E/-W	Latitude	Longitude
KOP: HARVEY 5N (P4)	6377.80	-704.53	-1388.21	40.261741	-104.691398
EP: HARVEY 5N (P4)	7094.00	11.67	-1387.09	40.263707	-104.691394
BHL: HARVEY 5N (P4)	7094.00	9673.34	-1371.27	40.290228	-104.691340
SHL: HARVEY 5N (P4)	0.00	0.00	0.00	40.263675	-104.686424



# **PDC ENERGY**

**WELD COUNTY, COLORADO (TRUE)  
SW SE SEC. 32 T4N R65W 6th P.M. (HARVEY)  
HARVEY 5N**

**ORIGINAL WELLBORE  
PROPOSAL #4**

## **Anticollision Report**

**02 September, 2018**



## Anticollision Report



<b>Company:</b>	PDC ENERGY	<b>Local Co-ordinate Reference:</b>	Well HARVEY 5N
<b>Project:</b>	WELD COUNTY, COLORADO (TRUE)	<b>TVD Reference:</b>	KB-EST @ 4919.00usft (Original Well Elev)
<b>Reference Site:</b>	SW SE SEC. 32 T4N R65W 6th P.M. (HARVEY)	<b>MD Reference:</b>	KB-EST @ 4919.00usft (Original Well Elev)
<b>Site Error:</b>	0.00 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	HARVEY 5N	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 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 #4	<b>Offset TVD Reference:</b>	Offset Datum

<b>Reference</b>	PROPOSAL #4		
<b>Filter type:</b>	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
<b>Interpolation Method:</b>	MD + Stations Interval 100.00usft	<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 10,000.00 usft	<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>	02/09/2018		
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>
0.00	17,431.85	PROPOSAL #4 (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
SE SW SEC. 32 T4N R65W 6th P.M.						
EXIST VERT HAMBERT R G 32-5 - Wellbore #1 - Desig	10,283.67	7,094.00	881.66	813.10	12.860	CC
EXIST VERT HAMBERT R G 32-5 - Wellbore #1 - Desig	10,300.00	7,094.01	881.81	812.96	12.808	ES
EXIST VERT HAMBERT R G 32-5 - Wellbore #1 - Desig	10,500.00	7,094.01	907.81	835.38	12.533	SF
SW SE SEC. 32 T4N R65W 6th P.M. (HARVEY)						
ABDN VERT BOHLENDER 2 - Wellbore #1 - Design #1	15,585.84	4,856.00	3,846.33	3,710.21	28.256	CC
ABDN VERT BOHLENDER 2 - Wellbore #1 - Design #1	15,600.00	4,856.00	3,846.36	3,710.00	28.209	ES
ABDN VERT BOHLENDER 2 - Wellbore #1 - Design #1	17,300.00	4,856.00	4,211.00	4,047.26	25.718	SF
ABDN VERT BOHLENDER 31-29 #3 - Wellbore #1 - Des	16,855.07	4,736.00	2,989.15	2,861.39	23.398	CC
ABDN VERT BOHLENDER 31-29 #3 - Wellbore #1 - Des	16,900.00	4,736.00	2,989.48	2,861.14	23.293	ES
ABDN VERT BOHLENDER 31-29 #3 - Wellbore #1 - Des	17,431.85	4,736.00	3,044.28	2,909.00	22.503	SF
ABDN VERT HAMBERT R G 32-4 - Wellbore #1 - Design	11,681.45	7,094.01	665.58	571.47	7.073	CC
ABDN VERT HAMBERT R G 32-4 - Wellbore #1 - Design	11,700.00	7,094.01	665.83	571.39	7.050	ES
ABDN VERT HAMBERT R G 32-4 - Wellbore #1 - Design	11,800.00	7,094.01	676.05	579.74	7.020	SF
ABDN VERT HSR-MAYA 4-29 - Wellbore #1 - Wellbore #	16,210.07	7,000.00	646.64	481.47	3.915	CC, ES
ABDN VERT HSR-MAYA 4-29 - Wellbore #1 - Wellbore #	16,300.00	7,000.00	652.87	486.00	3.912	SF
ABDN VERT MUSICK MCCLINTOCK 3 - Wellbore #1 - W	11,633.22	4,521.19	2,694.67	2,645.69	55.015	CC, ES
ABDN VERT MUSICK MCCLINTOCK 3 - Wellbore #1 - W	12,900.00	4,521.19	2,977.59	2,917.45	49.511	SF
ABDN VERT NGL C3 - Wellbore #1 - Design #1	11,477.22	7,094.01	811.20	720.89	8.982	CC
ABDN VERT NGL C3 - Wellbore #1 - Design #1	11,500.00	7,094.01	811.52	720.78	8.944	ES
ABDN VERT NGL C3 - Wellbore #1 - Design #1	11,600.00	7,094.01	820.44	727.85	8.861	SF
ABDN VERT UPRR 21 PAN AM A#1 - Wellbore #1 - Wel	12,990.15	7,100.00	740.56	636.15	7.093	CC
ABDN VERT UPRR 21 PAN AM A#1 - Wellbore #1 - Wel	13,000.00	7,100.00	740.62	636.03	7.081	ES
ABDN VERT UPRR 21 PAN AM A#1 - Wellbore #1 - Wel	13,100.00	7,100.00	748.66	642.18	7.031	SF
EXIST DD NGL C3A - Wellbore #1 - Wellbore #1	13,548.83	7,408.88	954.71	801.80	6.244	CC, ES
EXIST DD NGL C3A - Wellbore #1 - Wellbore #1	13,700.00	7,458.65	965.42	809.41	6.188	SF
EXIST DD RAY 23-32 - Wellbore #1 - Wellbore #1	100.00	94.92	359.52	359.35	2,039.291	CC
EXIST DD RAY 23-32 - Wellbore #1 - Wellbore #1	1,100.00	1,093.01	360.97	357.05	92.032	ES
EXIST DD RAY 23-32 - Wellbore #1 - Wellbore #1	8,600.00	7,169.81	1,311.04	1,267.26	29.945	SF
EXIST DD RAY 24-32 - Wellbore #1 - Wellbore #1	1,102.62	1,099.72	2,302.40	2,298.46	584.136	CC, ES
EXIST DD RAY 24-32 - Wellbore #1 - Wellbore #1	11,700.00	7,173.19	3,364.57	3,269.04	35.220	SF
EXIST DD RAY 36-32 - Wellbore #1 - Wellbore #1	1,131.26	1,127.40	315.33	311.26	77.350	CC
EXIST DD RAY 36-32 - Wellbore #1 - Wellbore #1	1,200.00	1,196.19	315.57	311.21	72.368	ES
EXIST DD RAY 36-32 - Wellbore #1 - Wellbore #1	4,100.00	4,062.22	669.65	644.95	27.109	SF
EXIST DD RURAL LAND G32-33D - Wellbore #1 - Wellb	8,440.76	7,229.76	1,365.83	1,324.32	32.905	CC, ES
EXIST DD RURAL LAND G32-33D - Wellbore #1 - Wellb	9,200.00	7,231.93	1,562.67	1,510.72	30.079	SF

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



<b>Company:</b>	PDC ENERGY	<b>Local Co-ordinate Reference:</b>	Well HARVEY 5N
<b>Project:</b>	WELD COUNTY, COLORADO (TRUE)	<b>TVD Reference:</b>	KB-EST @ 4919.00usft (Original Well Elev)
<b>Reference Site:</b>	SW SE SEC. 32 T4N R65W 6th P.M. (HARVEY)	<b>MD Reference:</b>	KB-EST @ 4919.00usft (Original Well Elev)
<b>Site Error:</b>	0.00 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	HARVEY 5N	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 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 #4	<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
SW SE SEC. 32 T4N R65W 6th P.M. (HARVEY)						
EXIST DD SPAYD 19-29 - Wellbore #1 - Wellbore #1	13,584.94	7,508.66	119.21	-34.39	0.776	Level 1, CC, ES, SF
EXIST DD SPAYD 20-29 - Wellbore #1 - Wellbore #1	13,666.61	7,009.00	2,416.41	2,286.37	18.581	CC
EXIST DD SPAYD 20-29 - Wellbore #1 - Wellbore #1	13,700.00	7,009.00	2,416.64	2,285.97	18.493	ES
EXIST DD SPAYD 20-29 - Wellbore #1 - Wellbore #1	14,500.00	7,001.77	2,556.07	2,410.29	17.533	SF
EXIST DD SPAYD 22-29 - Wellbore #1 - Wellbore #1	14,675.33	7,105.29	126.68	-24.13	0.840	Level 1, CC, ES, SF
EXIST DD SPAYD 23-29 - Wellbore #1 - Wellbore #1	13,693.06	7,333.34	1,267.83	1,133.98	9.472	CC
EXIST DD SPAYD 23-29 - Wellbore #1 - Wellbore #1	13,700.00	7,333.23	1,267.85	1,133.87	9.463	ES
EXIST DD SPAYD 23-29 - Wellbore #1 - Wellbore #1	13,900.00	7,329.88	1,284.61	1,146.87	9.327	SF
EXIST DD SPAYD 30-29 - Wellbore #1 - Wellbore #1	17,431.85	7,501.66	1,411.94	1,187.14	6.281	CC, ES, SF
EXIST DD SPAYD 33-29 - Wellbore #1 - Wellbore #1	13,611.64	7,567.39	1,364.44	1,209.98	8.834	CC, ES
EXIST DD SPAYD 33-29 - Wellbore #1 - Wellbore #1	13,800.00	7,565.52	1,377.38	1,219.35	8.716	SF
EXIST DD SPAYD 36-29 - Wellbore #1 - Wellbore #1	12,336.87	7,456.72	1,051.47	931.52	8.765	CC, ES
EXIST DD SPAYD 36-29 - Wellbore #1 - Wellbore #1	12,500.00	7,455.15	1,064.05	941.05	8.651	SF
EXIST DD SPAYD 37-29 - Wellbore #1 - Wellbore #1	12,388.37	7,224.67	2,359.04	2,241.68	20.101	CC
EXIST DD SPAYD 37-29 - Wellbore #1 - Wellbore #1	12,400.00	7,224.37	2,359.07	2,241.49	20.064	ES
EXIST DD SPAYD 37-29 - Wellbore #1 - Wellbore #1	13,300.00	7,202.56	2,528.94	2,394.53	18.815	SF
EXIST VERT BOHLENDER 29-13 - Wellbore #1 - Design	15,468.73	7,094.00	1,986.75	1,821.16	11.998	CC
EXIST VERT BOHLENDER 29-13 - Wellbore #1 - Design	15,500.00	7,094.00	1,987.00	1,820.81	11.957	ES
EXIST VERT BOHLENDER 29-13 - Wellbore #1 - Design	15,900.00	7,094.00	2,033.02	1,859.22	11.697	SF
EXIST VERT BOHLENDER 29-3 - Wellbore #1 - Design	15,390.69	7,091.00	3,203.31	3,039.21	19.520	CC
EXIST VERT BOHLENDER 29-3 - Wellbore #1 - Design	15,500.00	7,091.00	3,205.17	3,038.99	19.287	ES
EXIST VERT BOHLENDER 29-3 - Wellbore #1 - Design	16,600.00	7,091.00	3,423.97	3,236.83	18.297	SF
EXIST VERT BOHLENDER 32-29 #1 - Wellbore #1 - Des	15,641.76	7,094.00	1,762.42	1,593.54	10.436	CC
EXIST VERT BOHLENDER 32-29 #1 - Wellbore #1 - Des	15,700.00	7,094.00	1,763.38	1,593.39	10.373	ES
EXIST VERT BOHLENDER 32-29 #1 - Wellbore #1 - Des	16,000.00	7,094.00	1,798.46	1,622.76	10.236	SF
EXIST VERT CLYDE MARSHALL 1 - Wellbore #1 - Desi	2,576.02	2,523.71	1,407.53	1,393.24	98.524	CC
EXIST VERT CLYDE MARSHALL 1 - Wellbore #1 - Desi	2,700.00	2,639.26	1,408.25	1,392.81	91.249	ES
EXIST VERT CLYDE MARSHALL 1 - Wellbore #1 - Desi	5,200.00	4,765.00	1,710.98	1,674.93	47.465	SF
EXIST VERT CPC BOHLENDER 29-1 - Wellbore #1 - De	16,833.06	7,094.00	3,013.85	2,822.26	15.731	CC
EXIST VERT CPC BOHLENDER 29-1 - Wellbore #1 - De	16,900.00	7,094.00	3,014.59	2,821.73	15.631	ES
EXIST VERT CPC BOHLENDER 29-1 - Wellbore #1 - De	17,431.85	7,094.00	3,072.75	2,869.78	15.139	SF
EXIST VERT CPC BOHLENDER 29-2 - Wellbore #1 - De	17,111.52	7,094.00	1,824.91	1,628.01	9.268	CC, ES
EXIST VERT CPC BOHLENDER 29-2 - Wellbore #1 - De	17,400.00	7,094.00	1,847.57	1,645.17	9.128	SF
EXIST VERT HAMBERT G 32-4X - Wellbore #1 - Design	11,448.02	7,094.01	611.36	521.59	6.810	CC, ES
EXIST VERT HAMBERT G 32-4X - Wellbore #1 - Design	11,500.00	7,094.01	613.57	522.83	6.762	SF
EXIST VERT HAMBERT R G 32-1 - Wellbore #1 - Desig	11,694.72	7,094.01	3,039.20	2,944.85	32.212	CC
EXIST VERT HAMBERT R G 32-1 - Wellbore #1 - Desig	11,800.00	7,094.01	3,041.02	2,944.71	31.576	ES
EXIST VERT HAMBERT R G 32-1 - Wellbore #1 - Desig	13,600.00	7,094.01	3,587.01	3,456.88	27.566	SF
EXIST VERT HAMBERT R G 32-2 - Wellbore #1 - Desig	11,512.28	7,094.01	1,993.38	1,902.42	21.914	CC, ES
EXIST VERT HAMBERT R G 32-2 - Wellbore #1 - Desig	12,300.00	7,094.01	2,143.38	2,037.73	20.288	SF
EXIST VERT HAMBERT R G 32-3 - Wellbore #1 - Desig	11,579.21	7,094.01	578.54	486.34	6.275	CC
EXIST VERT HAMBERT R G 32-3 - Wellbore #1 - Desig	11,600.00	7,094.01	578.91	486.32	6.252	ES, SF
EXIST VERT HAMBERT R G 32-6 - Wellbore #1 - Desig	10,252.87	7,094.00	413.20	345.19	6.076	CC, ES
EXIST VERT HAMBERT R G 32-6 - Wellbore #1 - Desig	10,300.00	7,094.01	415.88	347.03	6.040	SF
EXIST VERT HAMBERT R G 32-7 - Wellbore #1 - Desig	10,233.32	7,094.00	1,861.53	1,793.87	27.512	CC, ES
EXIST VERT HAMBERT R G 32-7 - Wellbore #1 - Desig	11,200.00	7,094.01	2,097.56	2,012.36	24.621	SF
EXIST VERT HAMBERT R G 32-8 - Wellbore #1 - Desig	10,548.87	7,094.01	3,217.49	3,144.17	43.886	CC
EXIST VERT HAMBERT R G 32-8 - Wellbore #1 - Desig	10,600.00	7,094.01	3,217.89	3,143.65	43.346	ES
EXIST VERT HAMBERT R G 32-8 - Wellbore #1 - Desig	13,200.00	7,094.01	4,168.98	4,046.41	34.013	SF
EXIST VERT HSR-CARTER 11-29 - Wellbore #1 - Desig	14,078.45	7,094.01	635.90	496.72	4.569	CC
EXIST VERT HSR-CARTER 11-29 - Wellbore #1 - Desig	14,100.00	7,094.01	636.27	496.68	4.558	ES, SF
EXIST VERT HSR-CROUSE 5-29 - Wellbore #1 - Design	15,384.45	7,094.00	735.00	571.01	4.482	CC

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

<b>Company:</b>	PDC ENERGY	<b>Local Co-ordinate Reference:</b>	Well HARVEY 5N
<b>Project:</b>	WELD COUNTY, COLORADO (TRUE)	<b>TVD Reference:</b>	KB-EST @ 4919.00usft (Original Well Elev)
<b>Reference Site:</b>	SW SE SEC. 32 T4N R65W 6th P.M. (HARVEY)	<b>MD Reference:</b>	KB-EST @ 4919.00usft (Original Well Elev)
<b>Site Error:</b>	0.00 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	HARVEY 5N	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 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 #4	<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
<b>Offset Well - Wellbore - Design</b>						
SW SE SEC. 32 T4N R65W 6th P.M. (HARVEY)						
EXIST VERT HSR-CROUSE 5-29 - Wellbore #1 - Design	15,400.00	7,094.00	735.16	570.88	4.475	ES, SF
EXIST VERT HSR-DICERSON 14-29A - Wellbore #1 - D	12,952.18	7,094.01	288.95	171.05	2.451	CC, ES, SF
EXIST VERT HSR-FRISBIE 16-29A - Wellbore #1 - Desi	12,996.76	7,094.01	3,012.15	2,893.41	25.368	CC
EXIST VERT HSR-FRISBIE 16-29A - Wellbore #1 - Desi	13,100.00	7,094.01	3,013.92	2,893.23	24.974	ES
EXIST VERT HSR-FRISBIE 16-29A - Wellbore #1 - Desi	14,400.00	7,094.01	3,322.96	3,177.68	22.873	SF
EXIST VERT HSR-FROELICH 12-29A - Wellbore #1 - De	14,112.71	7,094.01	717.36	577.52	5.130	CC, ES
EXIST VERT HSR-FROELICH 12-29A - Wellbore #1 - De	14,200.00	7,094.01	722.65	581.16	5.108	SF
EXIST VERT HSR-HARRISON 9-32 - Wellbore #1 - Des	1,100.00	1,100.00	2,276.97	2,272.31	487.743	CC, ES
EXIST VERT HSR-HARRISON 9-32 - Wellbore #1 - Des	13,700.00	7,094.01	5,696.77	5,564.75	43.152	SF
EXIST VERT HSR-MUNDS 13.29 - Wellbore #1 - Design	13,136.97	7,094.01	808.18	686.80	6.658	CC, ES
EXIST VERT HSR-MUNDS 13.29 - Wellbore #1 - Design	13,200.00	7,094.01	810.64	688.07	6.614	SF
EXIST VERT HSR-NICHOLS 15-32 - Wellbore #1 - Desig	1,100.00	1,100.00	827.07	822.40	177.164	CC, ES
EXIST VERT HSR-NICHOLS 15-32 - Wellbore #1 - Desig	11,300.00	7,094.01	3,922.78	3,835.74	45.070	SF
EXIST VERT HSR-RAY 3-29 - Wellbore #1 - Design #1	16,857.59	7,094.00	316.62	124.57	1.649	CC, ES, SF
EXIST VERT HSR-SALISBURY 6-29 - Wellbore #1 - Des	15,676.48	7,094.00	297.65	128.10	1.756	CC, ES, SF
EXIST VERT HSR-TEAGLE 10-29A - Wellbore #1 - Desi	14,417.99	7,094.01	1,740.50	1,594.88	11.952	CC, ES
EXIST VERT HSR-TEAGLE 10-29A - Wellbore #1 - Desi	14,800.00	7,094.01	1,781.92	1,629.05	11.656	SF
EXIST VERT HSR-WILLIAM 10-32A - Wellbore #1 - Des	1,100.00	1,100.00	1,336.12	1,331.46	286.206	CC, ES
EXIST VERT HSR-WILLIAM 10-32A - Wellbore #1 - Des	10,400.00	7,094.01	2,335.48	2,264.85	33.063	SF
EXIST VERT HSR-WRIGHT 9-29A - Wellbore #1 - Desig	14,351.16	7,094.01	2,925.84	2,781.48	20.268	CC
EXIST VERT HSR-WRIGHT 9-29A - Wellbore #1 - Desig	14,400.00	7,094.01	2,926.25	2,780.97	20.142	ES
EXIST VERT HSR-WRIGHT 9-29A - Wellbore #1 - Desig	15,500.00	7,094.00	3,143.29	2,977.11	18.914	SF
EXIST VERT MARSHALL 32-11G - Wellbore #1 - Design	9,167.39	7,094.00	509.77	460.15	10.273	CC, ES
EXIST VERT MARSHALL 32-11G - Wellbore #1 - Design	9,300.00	7,094.00	526.74	475.02	10.184	SF
EXIST VERT MARSHALL 32-12G - Wellbore #1 - Design	8,819.55	7,094.00	639.46	595.01	14.387	CC, ES
EXIST VERT MARSHALL 32-12G - Wellbore #1 - Design	9,000.00	7,094.00	664.44	617.38	14.120	SF
EXIST VERT MARSHALL 32-14G - Wellbore #1 - Design	7,580.10	7,068.93	294.52	259.39	8.382	CC, ES
EXIST VERT MARSHALL 32-14G - Wellbore #1 - Design	7,600.00	7,073.88	295.15	259.92	8.379	SF
EXIST VERT MARSHALL G 32-13JI - Wellbore #1 - Des	6,750.00	6,482.26	1,199.83	1,155.12	26.838	SF
EXIST VERT MARSHALL G 32-13JI - Wellbore #1 - Des	7,715.13	7,091.89	1,006.21	971.00	28.576	CC, ES
EXIST VERT MEL SMOOKLER GAS UNIT 1 - Wellbore	8,299.56	7,094.00	481.84	443.61	12.601	CC
EXIST VERT MEL SMOOKLER GAS UNIT 1 - Wellbore	8,300.00	7,094.00	481.84	443.60	12.600	ES
EXIST VERT MEL SMOOKLER GAS UNIT 1 - Wellbore	8,400.00	7,094.00	492.20	452.97	12.545	SF
<b>EXIST VERT MUSICK 1-32 - Wellbore #1 - Design #1</b>	<b>10,660.90</b>	<b>7,094.01</b>	<b>50.10</b>	<b>-25.24</b>	<b>0.665</b>	<b>Level 1, CC, ES, SF</b>
EXIST VERT MUSICK GAS UNIT 1 - Wellbore #1 - Desi	10,694.25	7,094.01	2,573.75	2,497.81	33.890	CC
EXIST VERT MUSICK GAS UNIT 1 - Wellbore #1 - Desi	10,700.00	7,094.01	2,573.76	2,497.71	33.843	ES
EXIST VERT MUSICK GAS UNIT 1 - Wellbore #1 - Desi	12,300.00	7,094.01	3,033.57	2,927.92	28.715	SF
EXIST VERT MUSICK MCCLINTOCK 2 - Wellbore #1 - D	10,365.86	4,755.00	2,436.02	2,402.53	72.727	CC
EXIST VERT MUSICK MCCLINTOCK 2 - Wellbore #1 - D	10,400.00	4,755.00	2,436.26	2,402.48	72.114	ES
EXIST VERT MUSICK MCCLINTOCK 2 - Wellbore #1 - D	11,900.00	4,755.00	2,878.85	2,832.20	61.715	SF
EXIST VERT MUSICK MCCLINTOCK 4 - Wellbore #1 - D	1,100.00	1,100.00	3,002.36	2,997.70	643.126	CC, ES
EXIST VERT MUSICK MCCLINTOCK 4 - Wellbore #1 - D	15,100.00	4,750.00	6,227.74	6,101.63	49.381	SF
EXIST VERT MUSICK MCCLINTOCK 6 - Wellbore #1 - D	10,464.81	4,750.00	2,416.11	2,377.79	63.048	CC
EXIST VERT MUSICK MCCLINTOCK 6 - Wellbore #1 - D	10,500.00	4,750.00	2,416.37	2,377.76	62.594	ES
EXIST VERT MUSICK MCCLINTOCK 6 - Wellbore #1 - D	11,700.00	4,750.00	2,713.54	2,665.18	56.109	SF
EXIST VERT MUSICK MCCLINTOCK 7 - Wellbore #1 - D	1,100.00	1,100.00	2,558.39	2,553.73	548.025	CC, ES
EXIST VERT MUSICK MCCLINTOCK 7 - Wellbore #1 - D	13,200.00	4,739.00	4,274.04	4,191.32	51.668	SF
EXIST VERT MUSICK-MCCLINTOCK 1 - Wellbore #1 - D	11,638.91	4,803.00	2,978.12	2,916.72	48.498	CC
EXIST VERT MUSICK-MCCLINTOCK 1 - Wellbore #1 - D	11,700.00	4,803.00	2,978.75	2,916.54	47.879	ES
EXIST VERT MUSICK-MCCLINTOCK 1 - Wellbore #1 - D	13,600.00	4,803.00	3,565.81	3,478.31	40.750	SF
EXIST VERT MUSICK-MCCLINTOCK 5 - Wellbore #1 - D	11,692.20	4,752.00	2,374.07	2,331.78	56.128	CC
EXIST VERT MUSICK-MCCLINTOCK 5 - Wellbore #1 - D	11,700.00	4,752.00	2,374.09	2,331.73	56.049	ES

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

<b>Company:</b>	PDC ENERGY	<b>Local Co-ordinate Reference:</b>	Well HARVEY 5N
<b>Project:</b>	WELD COUNTY, COLORADO (TRUE)	<b>TVD Reference:</b>	KB-EST @ 4919.00usft (Original Well Elev)
<b>Reference Site:</b>	SW SE SEC. 32 T4N R65W 6th P.M. (HARVEY)	<b>MD Reference:</b>	KB-EST @ 4919.00usft (Original Well Elev)
<b>Site Error:</b>	0.00 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	HARVEY 5N	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 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 #4	<b>Offset TVD Reference:</b>	Offset Datum

## Summary

Site Name Offset Well - Wellbore - Design	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
SW SE SEC. 32 T4N R65W 6th P.M. (HARVEY)						
EXIST VERT MUSICK-MCCLINTOCK 5 - Wellbore #1 - D	12,700.00	4,752.00	2,579.12	2,529.03	51.486	SF
EXIST VERT NGL C3B - Wellbore #1 - Design #1	16,538.75	7,094.00	3,455.16	3,269.19	18.579	CC
EXIST VERT NGL C3B - Wellbore #1 - Design #1	16,600.00	7,094.00	3,455.70	3,268.56	18.466	ES
EXIST VERT NGL C3B - Wellbore #1 - Design #1	17,431.85	7,094.00	3,568.71	3,365.74	17.582	SF
EXIST VERT R G 32-5 - Wellbore #1 - Design #1	10,283.67	7,094.00	881.66	813.10	12.860	CC
EXIST VERT R G 32-5 - Wellbore #1 - Design #1	10,300.00	7,094.01	881.81	812.96	12.808	ES
EXIST VERT R G 32-5 - Wellbore #1 - Design #1	10,500.00	7,094.01	907.81	835.38	12.533	SF
EXIST VERT SPAYD 5-29 - Wellbore #1 - Design #1	15,758.90	7,094.00	998.97	827.85	5.838	CC, ES
EXIST VERT SPAYD 5-29 - Wellbore #1 - Design #1	15,900.00	7,094.00	1,008.88	835.08	5.805	SF
EXIST VERT UPRR 21 PAN AM D #1 - Wellbore #1 - De	14,238.47	4,730.00	2,409.93	2,346.84	38.201	CC, ES
EXIST VERT UPRR 21 PAN AM D #1 - Wellbore #1 - De	15,000.00	4,730.00	2,527.39	2,458.18	36.521	SF
EXIST VERT UPRR 21 PAN AM D #2 - Wellbore #1 - De	12,956.94	7,094.01	3,160.10	3,042.11	26.783	CC
EXIST VERT UPRR 21 PAN AM D #2 - Wellbore #1 - De	13,000.00	7,094.01	3,160.39	3,041.59	26.603	ES
EXIST VERT UPRR 21 PAN AM D #2 - Wellbore #1 - De	14,600.00	7,094.01	3,561.71	3,412.63	23.892	SF
EXIST VERT UPRR 21 PAN AM G #1 - Wellbore #1 - De	16,223.15	4,660.00	2,445.62	2,368.39	31.667	CC, ES
EXIST VERT UPRR 21 PAN AM G #1 - Wellbore #1 - De	16,800.00	4,660.00	2,512.73	2,431.19	30.815	SF
EXIST VERT UPRR PAN AM "J"1 - Wellbore #1 - Design	13,049.13	7,094.01	1,661.59	1,541.86	13.878	CC
EXIST VERT UPRR PAN AM "J"1 - Wellbore #1 - Design	13,100.00	7,094.01	1,662.37	1,541.68	13.775	ES
EXIST VERT UPRR PAN AM "J"1 - Wellbore #1 - Design	13,500.00	7,094.01	1,721.67	1,593.43	13.426	SF
EXIST VERT VERN MARSHALL 1 - Wellbore #1 - Desig	5,034.02	4,785.00	2,144.21	2,106.31	56.586	CC, ES
EXIST VERT VERN MARSHALL 1 - Wellbore #1 - Desig	5,600.00	4,785.00	2,217.91	2,176.16	53.124	SF
EXIST VERT WEINMASTER G 32-18 - Wellbore #1 - De	10,921.00	7,094.01	1,327.43	1,247.35	16.577	CC, ES
EXIST VERT WEINMASTER G 32-18 - Wellbore #1 - De	11,300.00	7,094.01	1,380.47	1,293.44	15.861	SF
HARVEY 10N - ORIGINAL WELLBORE - PROPOSAL #	1,100.00	1,100.00	89.98	85.31	19.275	CC, ES
HARVEY 10N - ORIGINAL WELLBORE - PROPOSAL #	17,431.85	17,389.22	1,664.17	1,289.65	4.444	SF
HARVEY 11N - ORIGINAL WELLBORE - PROPOSAL #4	1,100.00	1,100.00	74.97	70.31	16.060	CC, ES
HARVEY 11N - ORIGINAL WELLBORE - PROPOSAL #4	17,431.85	17,361.01	2,008.66	1,633.62	5.356	SF
HARVEY 12N - ORIGINAL WELLBORE - PROPOSAL #	1,100.00	1,100.00	59.96	55.30	12.845	CC, ES
HARVEY 12N - ORIGINAL WELLBORE - PROPOSAL #	17,431.85	17,458.28	2,280.37	1,904.92	6.074	SF
HARVEY 13N - ORIGINAL WELLBORE - PROPOSAL #	1,000.00	1,000.00	15.01	10.79	3.559	CC, ES
HARVEY 13N - ORIGINAL WELLBORE - PROPOSAL #	1,100.00	1,099.71	15.91	11.27	3.424	SF
HARVEY 14N - ORIGINAL WELLBORE - PROPOSAL #	900.00	900.00	30.02	26.25	7.964	CC, ES
HARVEY 14N - ORIGINAL WELLBORE - PROPOSAL #	1,100.00	1,098.86	33.35	28.73	7.223	SF
HARVEY 15N - ORIGINAL WELLBORE - PROPOSAL #	800.00	800.00	44.99	41.67	13.553	CC, ES
HARVEY 15N - ORIGINAL WELLBORE - PROPOSAL #	17,431.85	17,644.07	3,298.39	2,920.49	8.728	SF
HARVEY 16N - ORIGINAL WELLBORE - PROPOSAL #	700.00	700.00	60.00	57.13	20.904	CC, ES
HARVEY 16N - ORIGINAL WELLBORE - PROPOSAL #	17,431.85	17,858.54	3,649.43	3,268.69	9.585	SF
HARVEY 1N - ORGINAL WELLBORE - PROPOSAL #6	300.00	300.00	119.97	118.89	111.894	CC, ES
HARVEY 1N - ORGINAL WELLBORE - PROPOSAL #6	17,200.00	17,504.15	1,275.97	914.19	3.527	SF
HARVEY 2N - ORIGINAL WELLBORE - PROPOSAL #5	400.00	400.00	104.99	103.47	68.998	CC, ES
HARVEY 2N - ORIGINAL WELLBORE - PROPOSAL #5	17,431.85	17,835.26	995.88	625.10	2.686	SF
HARVEY 3N - ORIGINAL WELLBORE - PROPOSAL #5	500.00	500.00	89.98	88.01	45.649	CC, ES
HARVEY 3N - ORIGINAL WELLBORE - PROPOSAL #5	17,431.85	17,603.66	595.19	220.19	1.587	SF
HARVEY 4N - ORIGINAL WELLBORE - PROPOSAL #5	600.00	600.00	74.97	72.55	30.972	CC
HARVEY 4N - ORIGINAL WELLBORE - PROPOSAL #5	17,431.85	17,589.00	324.16	-26.90	0.923	Level 1, ES, SF
HARVEY 6N - ORIGINAL WELLBORE - PROPOSAL #4	1,100.00	1,100.00	14.97	10.30	3.207	CC
HARVEY 6N - ORIGINAL WELLBORE - PROPOSAL #4	17,431.85	17,431.06	351.64	-14.64	0.960	Level 1, ES, SF
HARVEY 7N - ORIGINAL WELLBORE - PROPOSAL #4	1,100.00	1,100.00	29.98	25.31	6.422	CC, ES
HARVEY 7N - ORIGINAL WELLBORE - PROPOSAL #4	17,431.85	17,269.75	759.84	385.97	2.032	SF
HARVEY 8N - ORIGINAL WELLBORE - PROPOSAL #4	1,100.00	1,100.00	44.99	40.32	9.637	CC, ES
HARVEY 8N - ORIGINAL WELLBORE - PROPOSAL #4	17,431.85	17,340.59	1,043.64	669.65	2.791	SF
HARVEY 9N - ORIGINAL WELLBORE - PROPOSAL #4	1,100.00	1,100.00	104.96	100.29	22.482	CC, ES

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

## Anticollision Report



<b>Company:</b>	PDC ENERGY	<b>Local Co-ordinate Reference:</b>	Well HARVEY 5N
<b>Project:</b>	WELD COUNTY, COLORADO (TRUE)	<b>TVD Reference:</b>	KB-EST @ 4919.00usft (Original Well Elev)
<b>Reference Site:</b>	SW SE SEC. 32 T4N R65W 6th P.M. (HARVEY)	<b>MD Reference:</b>	KB-EST @ 4919.00usft (Original Well Elev)
<b>Site Error:</b>	0.00 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	HARVEY 5N	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 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 #4	<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 SE SEC. 32 T4N R65W 6th P.M. (HARVEY)						
HARVEY 9N - ORIGINAL WELLBORE - PROPOSAL #4	17,431.85	17,290.40	1,363.78	990.78	3.656	SF
SW SW SEC. 33 T4N R65W 6th P.M. (CRAWFORD)						
EXIST DD RAY 39-32 - Wellbore #1 - Wellbore #1	100.00	66.72	2,235.61	2,235.45	10,000.000	CC, ES
EXIST DD RAY 39-32 - Wellbore #1 - Wellbore #1	16,600.00	7,210.43	9,088.99	8,898.80	47.790	SF
EXIST DD SPAYD 39-29 - Wellbore #1 - Wellbore #1	13,647.20	7,107.44	3,745.04	3,613.98	28.574	CC
EXIST DD SPAYD 39-29 - Wellbore #1 - Wellbore #1	13,700.00	7,107.61	3,745.41	3,613.35	28.361	ES
EXIST DD SPAYD 39-29 - Wellbore #1 - Wellbore #1	15,700.00	7,097.00	4,270.76	4,100.76	25.122	SF
EXIST VERT HSR-KOCH 16-32 - Wellbore #1 - Design #	1,100.00	1,072.00	1,789.39	1,784.78	388.064	CC, ES
EXIST VERT HSR-KOCH 16-32 - Wellbore #1 - Design #	16,900.00	7,066.00	9,920.38	9,727.57	51.453	SF

Offset Design													SE SW SEC. 32 T4N R65W 6th P.M. - EXIST VERT HAMBERT R G 32-5 - Wellbore #1 - Design #1		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		Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor				
							+N/-S (usft)	+E/-W (usft)								
0.00	0.00	0.00	0.00	0.00	0.00	-41.87	2,526.58	-2,264.77	3,393.05							
100.00	100.00	100.00	100.00	0.09	0.09	-41.87	2,526.58	-2,264.77	3,393.05	3,392.88	0.17	N/A				
200.00	200.00	200.00	200.00	0.31	0.31	-41.87	2,526.58	-2,264.77	3,393.05	3,392.43	0.62	5,449.795				
300.00	300.00	300.00	300.00	0.54	0.54	-41.87	2,526.58	-2,264.77	3,393.05	3,391.98	1.07	3,164.766				
400.00	400.00	400.00	400.00	0.76	0.76	-41.87	2,526.58	-2,264.77	3,393.05	3,391.53	1.52	2,229.828				
500.00	500.00	500.00	500.00	0.99	0.99	-41.87	2,526.58	-2,264.77	3,393.05	3,391.08	1.97	1,721.315				
600.00	600.00	600.00	600.00	1.21	1.21	-41.87	2,526.58	-2,264.77	3,393.05	3,390.63	2.42	1,401.665				
700.00	700.00	700.00	700.00	1.44	1.44	-41.87	2,526.58	-2,264.77	3,393.05	3,390.18	2.87	1,182.141				
800.00	800.00	800.00	800.00	1.66	1.66	-41.87	2,526.58	-2,264.77	3,393.05	3,389.73	3.32	1,022.067				
900.00	900.00	900.00	900.00	1.88	1.88	-41.87	2,526.58	-2,264.77	3,393.05	3,389.28	3.77	900.175				
1,000.00	1,000.00	1,000.00	1,000.00	2.11	2.11	-41.87	2,526.58	-2,264.77	3,393.05	3,388.84	4.22	804.259				
1,100.00	1,100.00	1,100.00	1,100.00	2.33	2.33	-41.87	2,526.58	-2,264.77	3,393.05	3,388.39	4.67	726.814				
1,200.00	1,199.98	1,199.98	1,199.98	2.54	2.56	75.07	2,526.58	-2,264.77	3,392.60	3,387.51	5.10	665.527				
1,300.00	1,299.84	1,299.84	1,299.84	2.73	2.78	75.18	2,526.58	-2,264.77	3,391.26	3,385.75	5.51	615.074				
1,400.00	1,399.45	1,399.45	1,399.45	2.94	3.01	75.37	2,526.58	-2,264.77	3,389.04	3,383.09	5.94	570.248				
1,500.00	1,498.70	1,498.70	1,498.70	3.17	3.23	75.63	2,526.58	-2,264.77	3,385.96	3,379.57	6.39	529.611				
1,600.00	1,597.47	1,597.47	1,597.47	3.43	3.45	75.96	2,526.58	-2,264.77	3,382.08	3,375.20	6.87	492.077				
1,700.00	1,695.62	1,695.62	1,695.62	3.74	3.67	76.35	2,526.58	-2,264.77	3,377.43	3,370.04	7.39	456.908				
1,800.00	1,793.06	1,793.06	1,793.06	4.09	3.89	76.82	2,526.58	-2,264.77	3,372.08	3,364.12	7.96	423.666				
1,900.00	1,889.64	1,889.64	1,889.64	4.51	4.11	77.35	2,526.58	-2,264.77	3,366.11	3,357.52	8.58	392.153				
2,000.00	1,985.27	1,985.27	1,985.27	4.99	4.32	77.95	2,526.58	-2,264.77	3,359.58	3,350.31	9.27	362.328				
2,100.00	2,079.82	2,079.82	2,079.82	5.54	4.54	78.60	2,526.58	-2,264.77	3,352.60	3,342.57	10.03	334.240				
2,162.58	2,138.38	2,138.38	2,138.38	5.93	4.67	79.04	2,526.58	-2,264.77	3,348.04	3,337.50	10.54	317.576				
2,200.00	2,173.26	2,173.26	2,173.26	6.17	4.75	79.25	2,526.58	-2,264.77	3,345.31	3,334.45	10.86	308.039				
2,300.00	2,266.46	2,266.46	2,266.46	6.83	4.96	79.82	2,526.58	-2,264.77	3,338.26	3,326.54	11.73	284.634				
2,400.00	2,359.66	2,359.66	2,359.66	7.51	5.17	80.39	2,526.58	-2,264.77	3,331.60	3,318.98	12.62	264.008				
2,500.00	2,452.86	2,452.86	2,452.86	8.21	5.37	80.97	2,526.58	-2,264.77	3,325.31	3,311.78	13.53	245.812				
2,600.00	2,546.06	2,546.06	2,546.06	8.92	5.58	81.55	2,526.58	-2,264.77	3,319.41	3,304.96	14.45	229.718				
2,700.00	2,639.26	2,639.26	2,639.26	9.64	5.79	82.12	2,526.58	-2,264.77	3,313.90	3,298.51	15.38	215.429				
2,800.00	2,732.46	2,732.46	2,732.46	10.37	6.00	82.70	2,526.58	-2,264.77	3,308.77	3,292.44	16.32	202.692				
2,900.00	2,825.66	2,825.66	2,825.66	11.11	6.21	83.29	2,526.58	-2,264.77	3,304.03	3,286.76	17.27	191.291				
3,000.00	2,918.86	2,918.86	2,918.86	11.84	6.42	83.87	2,526.58	-2,264.77	3,299.68	3,281.46	18.23	181.042				

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