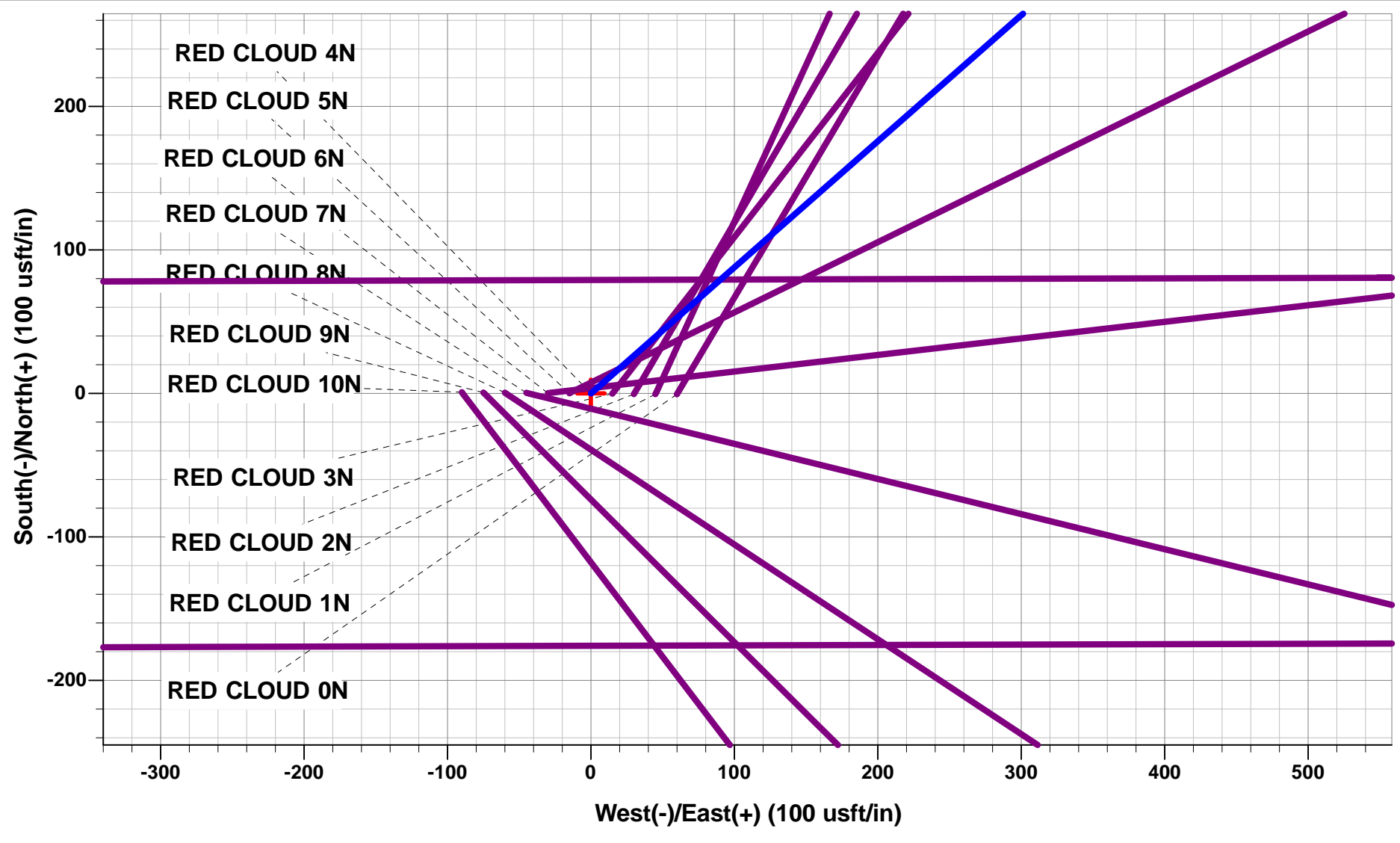




Project: WELD COUNTY, COLORADO (TRUE)
Site: SE NE SEC. 1 T4N R64W 6th P.M. (RED CLOUD)
Well: RED CLOUD 4N
Wellbore: ORIGINAL WELLBORE
Design: PROPOSAL #2

ANNOTATIONS									
TVD	MD	Inc	Azi	+N/-S	+E/-W	VSect	Dep	Annotation	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	SHL: 1529ft FNL & 689ft FEL of Sec 1	
700.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00	START NUDGE (2°/100ft BUR)	
1295.62	1300.00	12.00	48.69	41.32	47.03	-44.56	62.60	EOB TO 12° INC	
4917.61	5002.91	12.00	48.69	549.52	625.34	-592.50	832.48	END OF TANGENT	
5513.24	5602.91	0.00	48.69	590.84	672.37	-637.05	895.09	EOD TO VERTICAL	
5858.80	5948.47	0.00	0.00	590.84	672.37	-637.05	895.09	KOP (8°/100ft BUR)	
6575.00	7073.47	90.00	269.84	588.84	-43.82	77.82	1611.28	EP: 940ft FNL & 737ft FEL of Sec 1	
6575.00	16726.85	90.00	269.84	562.07	-9697.16	9713.44	11264.66	BHL: 940ft FNL & 50ft FWL of Sec 2	

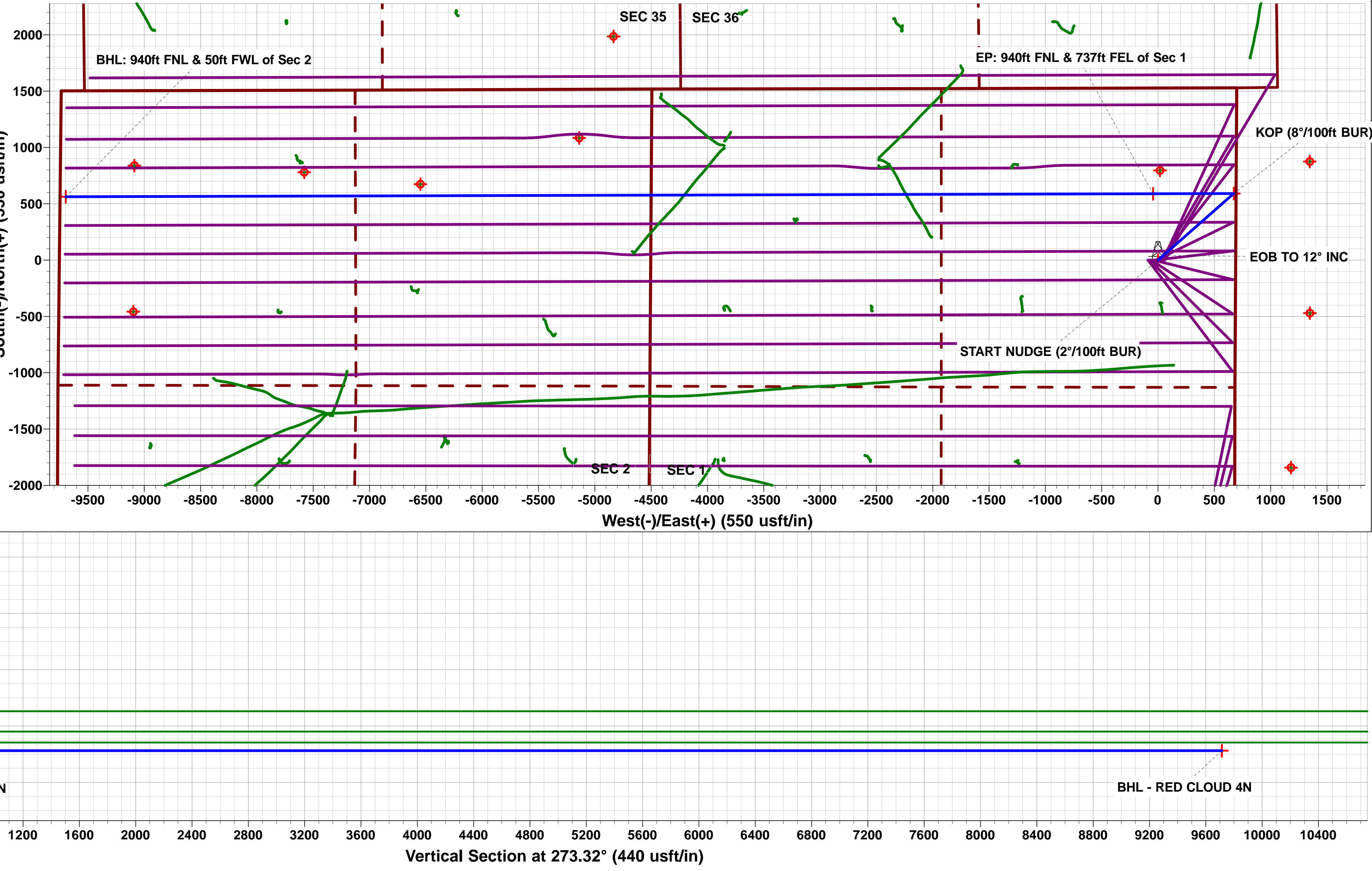
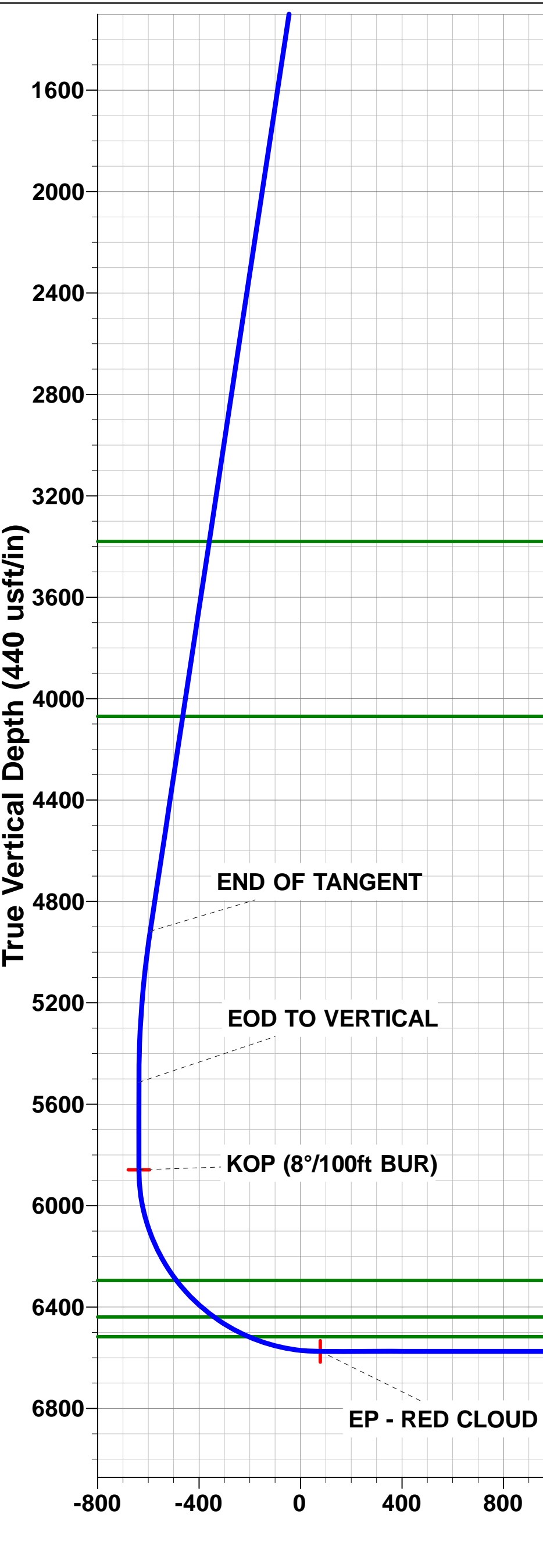
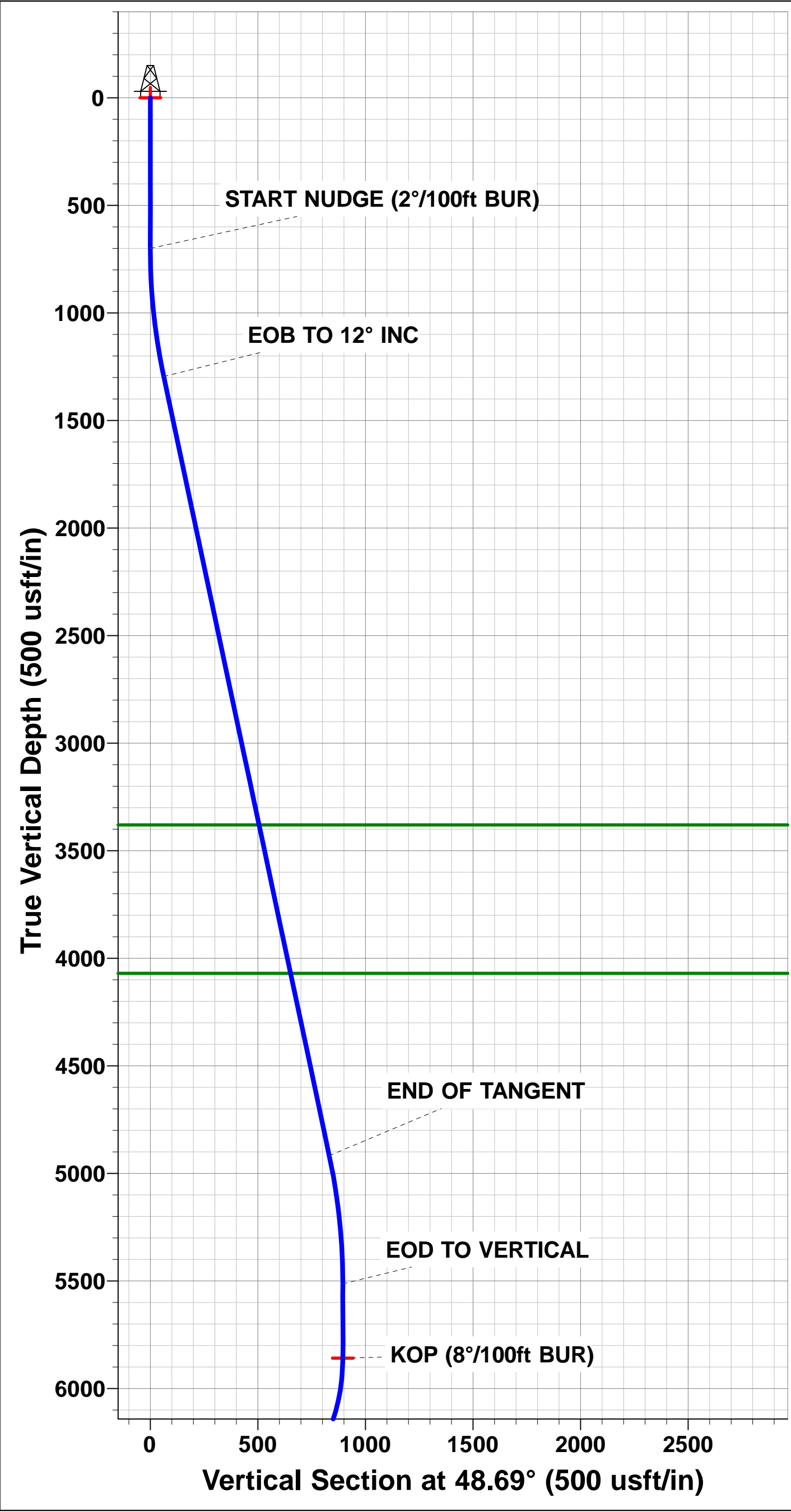
WELLBORE TARGET DETAILS (LAT/LONG)					
Name	TVD	+N/-S	+E/-W	Latitude	Longitude
KOP - RED CLOUD 4N	5858.80	590.84	672.37	40.346104	-104.489595
EP - RED CLOUD 4N	6575.00	588.84	-43.82	40.346099	-104.492165
BHL - RED CLOUD 4N	6575.00	562.07	-9697.16	40.346020	-104.526796
SHL - RED CLOUD 4N	0.00	0.00	0.00	40.344483	-104.492007



PROPOSED LOCAL COORDINATES:
SHL: 1529ft FNL & 689ft FEL of Sec 1
EP: 940ft FNL & 737ft FEL of Sec 1
BHL: 940ft FNL & 50ft FWL of Sec 2

Azimuths to True North
Magnetic North: 7.94°

Magnetic Field
Strength: 52267.3snT
Dip Angle: 66.82°
Date: 26/07/2018
Model: IGRF2015



PDC ENERGY

**WELD COUNTY, COLORADO (TRUE)
SE NE SEC. 1 T4N R64W 6th P.M. (RED CLOUD)
RED CLOUD 4N**

**ORIGINAL WELLBORE
PROPOSAL #2**

Anticollision Report

13 August, 2018



Anticollision Report



Company:	PDC ENERGY	Local Co-ordinate Reference:	Well RED CLOUD 4N
Project:	WELD COUNTY, COLORADO (TRUE)	TVD Reference:	KB-EST @ 4625.00usft (Original Well Elev)
Reference Site:	SE NE SEC. 1 T4N R64W 6th P.M. (RED CLOUD)	MD Reference:	KB-EST @ 4625.00usft (Original Well Elev)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	RED CLOUD 4N	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	13/08/2018		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.00	16,726.85	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						
SE NE SEC. 1 T4N R64W 6th P.M. (RED CLOUD)						
EXIST HZ SOONER STATE B #36-63HN - Wellbore #1 -	1,992.93	1,629.59	1,860.11	1,852.46	243.246	CC
EXIST HZ SOONER STATE B #36-63HN - Wellbore #1 -	10,800.00	11,055.00	1,935.05	1,688.91	7.862	ES
EXIST HZ SOONER STATE B #36-63HN - Wellbore #1 -	11,200.00	11,055.00	1,986.84	1,729.58	7.723	SF
EXIST VERT ROTHE #4-6 - Wellbore #1 - Design #1	5,948.47	5,841.80	732.45	594.79	5.321	CC, ES, SF
EXIST VERT ROTHE #5-6 - Wellbore #1 - Design #1	4,375.66	4,287.07	1,243.82	1,141.58	12.165	CC
EXIST VERT ROTHE #5-6 - Wellbore #1 - Design #1	5,950.00	5,843.33	1,258.71	1,120.59	9.113	ES
EXIST VERT ROTHE #5-6 - Wellbore #1 - Design #1	6,050.00	5,942.99	1,262.57	1,122.77	9.032	SF
RED CLOUD 0N - ORIGINAL WELLBORE - PROPOSAL	300.00	300.00	59.96	58.89	55.927	CC, ES
RED CLOUD 0N - ORIGINAL WELLBORE - PROPOSAL	16,600.00	17,188.44	1,058.79	492.75	1.871	SF
RED CLOUD 10N - ORIGINAL WELLBORE - PROPOSAL	700.00	700.00	89.98	87.11	31.350	CC, ES
RED CLOUD 10N - ORIGINAL WELLBORE - PROPOSAL	16,726.85	16,809.89	1,579.65	1,012.37	2.785	SF
RED CLOUD 1N - ORIGINAL WELLBORE - PROPOSAL	400.00	400.00	44.99	43.47	29.568	CC, ES
RED CLOUD 1N - ORIGINAL WELLBORE - PROPOSAL	16,726.85	16,824.82	791.81	225.39	1.398	Level 3, SF
RED CLOUD 2N - ORIGINAL WELLBORE - PROPOSAL	500.00	500.00	30.00	28.03	15.217	CC
RED CLOUD 2N - ORIGINAL WELLBORE - PROPOSAL	16,726.85	16,810.73	509.95	-57.28	0.899	Level 1, ES, SF
RED CLOUD 3N - ORIGINAL WELLBORE - PROPOSAL	600.00	600.00	15.00	12.58	6.195	CC
RED CLOUD 3N - ORIGINAL WELLBORE - PROPOSAL	16,726.85	16,688.00	265.76	-281.32	0.486	Level 1, ES, SF
RED CLOUD 5N - ORIGINAL WELLBORE - PROPOSAL	700.00	700.00	15.00	12.13	5.225	CC
RED CLOUD 5N - ORIGINAL WELLBORE - PROPOSAL	16,726.85	16,635.65	265.74	-279.60	0.487	Level 1, ES, SF
RED CLOUD 6N - ORIGINAL WELLBORE - PROPOSAL	700.00	700.00	29.99	27.12	10.450	CC
RED CLOUD 6N - ORIGINAL WELLBORE - PROPOSAL	16,726.85	16,703.28	509.87	-57.74	0.898	Level 1, ES, SF
RED CLOUD 7N - ORIGINAL WELLBORE - PROPOSAL	700.00	700.00	44.99	42.12	15.675	CC, ES
RED CLOUD 7N - ORIGINAL WELLBORE - PROPOSAL	16,726.85	16,622.70	769.01	204.55	1.362	Level 3, SF
RED CLOUD 8N - ORIGINAL WELLBORE - PROPOSAL	700.00	700.00	59.99	57.12	20.900	CC, ES
RED CLOUD 8N - ORIGINAL WELLBORE - PROPOSAL	16,726.85	16,705.13	1,069.80	502.69	1.886	SF
RED CLOUD 9N - ORIGINAL WELLBORE - PROPOSAL	700.00	700.00	74.99	72.12	26.125	CC, ES
RED CLOUD 9N - ORIGINAL WELLBORE - PROPOSAL	16,726.85	16,679.17	1,327.10	760.86	2.344	SF

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

Company:	PDC ENERGY	Local Co-ordinate Reference:	Well RED CLOUD 4N
Project:	WELD COUNTY, COLORADO (TRUE)	TVD Reference:	KB-EST @ 4625.00usft (Original Well Elev)
Reference Site:	SE NE SEC. 1 T4N R64W 6th P.M. (RED CLOUD)	MD Reference:	KB-EST @ 4625.00usft (Original Well Elev)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	RED CLOUD 4N	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		Separation Factor	Warning
Offset Well - Wellbore - Design			Between Centres (usft)	Between Ellipses (usft)		
SE NE SEC. 36 T5N R64W 6th P.M. (PYRAMID)						
ABDN VERT ROTHE STATE B #36-15 - Wellbore #1 - W	7,776.08	6,420.84	1,488.02	1,449.80	38.933	CC
ABDN VERT ROTHE STATE B #36-15 - Wellbore #1 - W	7,800.00	6,419.89	1,488.21	1,449.41	38.361	ES
ABDN VERT ROTHE STATE B #36-15 - Wellbore #1 - W	9,400.00	6,368.95	2,201.86	2,121.08	27.259	SF
ABDN VERT ROTHE STATE B #36-16 - Wellbore #1 - W	5,522.25	5,374.75	1,746.19	1,725.07	82.684	CC, ES
ABDN VERT ROTHE STATE B #36-16 - Wellbore #1 - W	16,000.00	6,200.00	9,434.52	9,173.32	36.119	SF
EXIST DD ECKHARDT B #35-13 - Wellbore #1 - Wellbor	15,932.83	6,687.98	1,477.16	1,213.05	5.593	CC
EXIST DD ECKHARDT B #35-13 - Wellbore #1 - Wellbor	16,000.00	6,687.63	1,478.69	1,212.69	5.559	ES
EXIST DD ECKHARDT B #35-13 - Wellbore #1 - Wellbor	16,200.00	6,686.57	1,501.13	1,229.51	5.527	SF
EXIST VERT BAKER STATE B #36-13 - Wellbore #1 - W	10,681.34	6,515.36	1,635.97	1,519.69	14.070	CC
EXIST VERT BAKER STATE B #36-13 - Wellbore #1 - W	10,700.00	6,514.35	1,636.07	1,519.28	14.009	ES
EXIST VERT BAKER STATE B #36-13 - Wellbore #1 - W	11,300.00	6,481.81	1,748.72	1,615.30	13.107	SF
EXIST VERT BAKER STATE B #36-14 - Wellbore #1 - W	9,294.37	6,496.82	1,496.37	1,418.29	19.166	CC
EXIST VERT BAKER STATE B #36-14 - Wellbore #1 - W	9,300.00	6,496.73	1,496.38	1,418.15	19.129	ES
EXIST VERT BAKER STATE B #36-14 - Wellbore #1 - W	10,100.00	6,483.34	1,699.40	1,599.22	16.963	SF
EXIST VERT HOSHIKO #2 - Wellbore #1 - Wellbore #1	13,253.45	6,616.47	1,641.97	1,453.81	8.726	CC
EXIST VERT HOSHIKO #2 - Wellbore #1 - Wellbore #1	13,300.00	6,616.85	1,642.63	1,453.17	8.670	ES
EXIST VERT HOSHIKO #2 - Wellbore #1 - Wellbore #1	13,700.00	6,620.20	1,701.60	1,500.95	8.480	SF
EXIST VERT HOSHIKO #35-16H4 - Wellbore #1 - Desig	11,859.65	6,585.03	1,409.46	1,132.26	5.085	CC
EXIST VERT HOSHIKO #35-16H4 - Wellbore #1 - Desig	11,900.00	6,585.03	1,410.03	1,131.71	5.066	ES
EXIST VERT HOSHIKO #35-16H4 - Wellbore #1 - Desig	12,100.00	6,585.03	1,429.80	1,145.90	5.036	SF
EXIST VERT HOSHIKO B #35-14 - Wellbore #1 - Wellbo	14,763.34	6,580.20	1,557.32	1,327.06	6.763	CC
EXIST VERT HOSHIKO B #35-14 - Wellbore #1 - Wellbo	14,800.00	6,579.84	1,557.75	1,326.46	6.735	ES
EXIST VERT HOSHIKO B #35-14 - Wellbore #1 - Wellbo	15,100.00	6,576.97	1,593.29	1,353.59	6.647	SF

Company:	PDC ENERGY	Local Co-ordinate Reference:	Well RED CLOUD 4N
Project:	WELD COUNTY, COLORADO (TRUE)	TVD Reference:	KB-EST @ 4625.00usft (Original Well Elev)
Reference Site:	SE NE SEC. 1 T4N R64W 6th P.M. (RED CLOUD)	MD Reference:	KB-EST @ 4625.00usft (Original Well Elev)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	RED CLOUD 4N	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 Offset Well - Wellbore - Design	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
SE SE SEC. 1 T4N R64W 6th P.M. (LINDSEY)						
ABDN DD MERCER C #11-30D - Wellbore #1 - Wellbore	16,726.85	6,562.62	4,409.52	4,123.67	15.426	CC, ES, SF
ABDN VERT BOOY HILLS FARM #2-12 - Wellbore #1 -	15,982.07	6,641.94	2,192.01	1,927.62	8.291	CC
ABDN VERT BOOY HILLS FARM #2-12 - Wellbore #1 -	16,000.00	6,642.17	2,192.08	1,927.19	8.275	ES
ABDN VERT BOOY HILLS FARM #2-12 - Wellbore #1 -	16,500.00	6,650.00	2,252.36	1,973.46	8.076	SF
ABDN VERT FHA #10-1 - Wellbore #1 - Wellbore #1	0.00	0.00	2,185.01			
ABDN VERT FHA #10-1 - Wellbore #1 - Wellbore #1	600.00	578.27	2,185.99	2,184.39	1,362.595	ES
ABDN VERT FHA #10-1 - Wellbore #1 - Wellbore #1	11,400.00	6,600.00	3,901.04	3,764.79	28.632	SF
ABDN VERT FHA #15-1 - Wellbore #1 - Wellbore #1	0.00	0.00	3,355.28			
ABDN VERT FHA #15-1 - Wellbore #1 - Wellbore #1	700.00	684.69	3,355.65	3,353.80	1,815.643	ES
ABDN VERT FHA #15-1 - Wellbore #1 - Wellbore #1	16,200.00	6,350.08	8,759.77	8,489.74	32.440	SF
ABDN VERT HOSHIKO C #2-8 - Wellbore #1 - Wellbore	12,484.44	6,598.33	1,100.95	934.22	6.603	CC
ABDN VERT HOSHIKO C #2-8 - Wellbore #1 - Wellbore	12,500.00	6,598.86	1,101.06	933.90	6.587	ES
ABDN VERT HOSHIKO C #2-8 - Wellbore #1 - Wellbore	12,700.00	6,606.09	1,121.84	949.10	6.495	SF
ABDN VERT SAND CREEK RANCH C #2-3X - Wellbore	14,679.98	6,566.72	360.17	132.03	1.579	CC
ABDN VERT SAND CREEK RANCH C #2-3X - Wellbore	14,700.00	6,567.14	360.72	132.02	1.577	ES, SF
ABDN VERT SAND CREEK RANCH CO #2-3 - Wellbore	14,608.82	6,581.02	211.89	-142.17	0.598	Level 1, CC, ES, SF
ABDN VERT SHAKLEE #1 - Wellbore #1 - Wellbore #1	16,214.20	6,557.02	3,628.93	3,357.99	13.393	CC
ABDN VERT SHAKLEE #1 - Wellbore #1 - Wellbore #1	16,300.00	6,557.18	3,629.95	3,356.59	13.279	ES
ABDN VERT SHAKLEE #1 - Wellbore #1 - Wellbore #1	16,726.85	6,557.99	3,664.96	3,379.63	12.845	SF
ABDN VERT SHAKLEE #2 - Wellbore #1 - Wellbore #1	14,880.50	6,561.22	3,600.52	3,366.92	15.413	CC
ABDN VERT SHAKLEE #2 - Wellbore #1 - Wellbore #1	15,000.00	6,564.99	3,602.50	3,365.55	15.203	ES
ABDN VERT SHAKLEE #2 - Wellbore #1 - Wellbore #1	16,400.00	6,611.11	3,907.65	3,631.43	14.147	SF
ABDN VERT SHAKLEE #3 - Wellbore #1 - Wellbore #1	14,840.55	6,589.98	2,330.90	2,098.45	10.028	CC
ABDN VERT SHAKLEE #3 - Wellbore #1 - Wellbore #1	14,900.00	6,589.25	2,331.66	2,097.54	9.960	ES
ABDN VERT SHAKLEE #3 - Wellbore #1 - Wellbore #1	15,500.00	6,582.43	2,422.37	2,171.44	9.653	SF
EXIST DD HOFFMAN C #2-20D - Wellbore #1 - Wellbore	15,416.99	6,724.67	1,617.30	1,347.97	6.005	CC
EXIST DD HOFFMAN C #2-20D - Wellbore #1 - Wellbore	15,500.00	6,725.84	1,619.43	1,347.77	5.961	ES
EXIST DD HOFFMAN C #2-20D - Wellbore #1 - Wellbore	15,700.00	6,728.63	1,641.87	1,364.60	5.922	SF
EXIST DD HOFFMAN C #2-25D - Wellbore #1 - Wellbore	15,487.36	6,863.08	3,025.52	2,751.73	11.050	CC
EXIST DD HOFFMAN C #2-25D - Wellbore #1 - Wellbore	15,600.00	6,863.06	3,027.62	2,750.66	10.932	ES
EXIST DD HOFFMAN C #2-25D - Wellbore #1 - Wellbore	16,400.00	6,862.94	3,160.17	2,860.78	10.555	SF
EXIST DD HOFFMAN C #2-33D - Wellbore #1 - Wellbore	16,726.85	7,352.57	3,033.48	2,696.23	8.995	CC, ES, SF
EXIST DD HOFFMAN C 2-21D - Wellbore #1 - Wellbore	14,236.12	6,604.40	1,556.86	1,329.65	6.852	CC
EXIST DD HOFFMAN C 2-21D - Wellbore #1 - Wellbore	14,300.00	6,604.48	1,558.17	1,329.17	6.804	ES
EXIST DD HOFFMAN C 2-21D - Wellbore #1 - Wellbore	14,500.00	6,604.72	1,579.06	1,344.46	6.731	SF
EXIST DD MARLEY C #1-18D - Wellbore #1 - Wellbore #	9,039.01	6,676.56	380.87	295.34	4.453	CC, ES
EXIST DD MARLEY C #1-18D - Wellbore #1 - Wellbore #	9,100.00	6,677.12	385.73	298.53	4.424	SF
EXIST DD MARLEY C #1-24D - Wellbore #1 - Wellbore #	8,852.58	7,096.36	3,091.90	2,983.10	28.417	CC
EXIST DD MARLEY C #1-24D - Wellbore #1 - Wellbore #	8,900.00	7,096.10	3,092.27	2,982.18	28.090	ES
EXIST DD MARLEY C #1-24D - Wellbore #1 - Wellbore #	11,300.00	7,082.29	3,943.30	3,767.08	22.377	SF
EXIST DD MARLEY C #1-28D - Wellbore #1 - Wellbore #	8,773.92	6,661.91	1,127.29	1,045.73	13.821	CC
EXIST DD MARLEY C #1-28D - Wellbore #1 - Wellbore #	8,800.00	6,662.13	1,127.60	1,045.33	13.707	ES
EXIST DD MARLEY C #1-28D - Wellbore #1 - Wellbore #	9,200.00	6,665.39	1,205.12	1,112.04	12.946	SF
EXIST DD MARLEY C #1-30D - Wellbore #1 - Wellbore #	11,437.75	6,633.37	898.00	745.49	5.888	CC, ES
EXIST DD MARLEY C #1-30D - Wellbore #1 - Wellbore #	11,600.00	6,633.59	912.54	755.51	5.811	SF
EXIST DD MARLEY C #1-31D - Wellbore #1 - Wellbore #	11,697.29	6,788.23	499.15	335.38	3.048	CC
EXIST DD MARLEY C #1-31D - Wellbore #1 - Wellbore #	11,700.00	6,788.26	499.16	335.31	3.047	ES, SF
EXIST DD MARLEY C #1-33D - Wellbore #1 - Wellbore #	11,402.79	6,689.17	2,990.79	2,839.96	19.829	CC
EXIST DD MARLEY C #1-33D - Wellbore #1 - Wellbore #	11,500.00	6,688.74	2,992.37	2,838.83	19.490	ES
EXIST DD MARLEY C #1-33D - Wellbore #1 - Wellbore #	13,100.00	6,682.31	3,438.80	3,240.59	17.349	SF
EXIST DD PANTHER C #11-27D - Wellbore #1 - Wellbor	12,899.60	6,712.07	4,288.97	4,096.15	22.243	CC
EXIST DD PANTHER C #11-27D - Wellbore #1 - Wellbor	13,000.00	6,711.56	4,290.15	4,094.52	21.930	ES

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

Company:	PDC ENERGY	Local Co-ordinate Reference:	Well RED CLOUD 4N
Project:	WELD COUNTY, COLORADO (TRUE)	TVD Reference:	KB-EST @ 4625.00usft (Original Well Elev)
Reference Site:	SE NE SEC. 1 T4N R64W 6th P.M. (RED CLOUD)	MD Reference:	KB-EST @ 4625.00usft (Original Well Elev)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	RED CLOUD 4N	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 Offset Well - Wellbore - Design	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
SE SE SEC. 1 T4N R64W 6th P.M. (LINDSEY)						
EXIST DD PANTHER C #11-27D - Wellbore #1 - Wellbor	15,600.00	6,698.87	5,068.28	4,799.83	18.880	SF
EXIST DD PANTHER C #11-28D - Wellbore #1 - Wellbor	14,256.93	7,101.23	4,267.80	4,013.14	16.759	CC
EXIST DD PANTHER C #11-28D - Wellbore #1 - Wellbor	14,400.00	7,099.43	4,270.19	4,011.53	16.508	ES
EXIST DD PANTHER C #11-28D - Wellbore #1 - Wellbor	16,300.00	7,077.54	4,731.57	4,419.64	15.169	SF
EXIST DD PANTHER C #2-23D - Wellbore #1 - Wellbore	12,872.51	6,724.82	2,997.87	2,805.61	15.593	CC
EXIST DD PANTHER C #2-23D - Wellbore #1 - Wellbore	13,000.00	6,723.53	3,000.57	2,804.76	15.323	ES
EXIST DD PANTHER C #2-23D - Wellbore #1 - Wellbore	14,200.00	6,711.14	3,278.61	3,049.23	14.293	SF
EXIST HZ BOBCAT C #12-69HN - Wellbore #1 - Wellbor	7,435.00	11,078.00	4,196.14	4,033.39	25.783	CC
EXIST HZ BOBCAT C #12-69HN - Wellbore #1 - Wellbor	7,500.00	11,078.00	4,196.64	4,032.49	25.565	ES
EXIST HZ BOBCAT C #12-69HN - Wellbore #1 - Wellbor	15,300.00	5,949.00	5,261.60	5,008.96	20.826	SF
EXIST HZ HOFFMAN C #02-65HN - Wellbore #1 - Wellb	6,875.35	13,691.00	1,523.10	1,297.37	6.747	CC
EXIST HZ HOFFMAN C #02-65HN - Wellbore #1 - Wellb	6,900.00	13,691.00	1,523.28	1,297.30	6.741	ES
EXIST HZ HOFFMAN C #02-65HN - Wellbore #1 - Wellb	6,950.00	13,691.00	1,524.77	1,298.21	6.730	SF
EXIST HZ TOBY C #12-79HN - Wellbore #1 - Wellbore #	11,479.48	6,057.00	4,398.64	4,243.57	28.366	CC
EXIST HZ TOBY C #12-79HN - Wellbore #1 - Wellbore #	11,600.00	6,057.00	4,400.29	4,241.90	27.782	ES
EXIST HZ TOBY C #12-79HN - Wellbore #1 - Wellbore #	14,900.00	6,057.00	5,572.09	5,322.46	22.322	SF
EXIST VERT AMIGO #1 - Wellbore #1 - Wellbore #1	10,829.38	6,350.00	1,051.77	933.43	8.887	CC, ES
EXIST VERT AMIGO #1 - Wellbore #1 - Wellbore #1	11,100.00	6,350.00	1,086.03	960.30	8.638	SF
EXIST VERT AMIGO #2 - Wellbore #1 - Wellbore #1	9,579.90	6,567.40	988.92	902.69	11.468	CC
EXIST VERT AMIGO #2 - Wellbore #1 - Wellbore #1	9,600.00	6,567.74	989.13	902.35	11.398	ES
EXIST VERT AMIGO #2 - Wellbore #1 - Wellbore #1	9,900.00	6,572.92	1,039.42	944.39	10.937	SF
EXIST VERT AMIGO FARMS #1-12 - Wellbore #1 - Well	10,890.88	6,565.48	2,336.63	2,214.61	19.150	CC
EXIST VERT AMIGO FARMS #1-12 - Wellbore #1 - Well	11,000.00	6,565.30	2,339.17	2,214.12	18.706	ES
EXIST VERT AMIGO FARMS #1-12 - Wellbore #1 - Well	12,100.00	6,563.57	2,630.93	2,475.23	16.897	SF
EXIST VERT FEIT #1 - Wellbore #1 - Wellbore #1	9,415.59	6,544.62	269.48	188.16	3.314	CC, ES, SF
EXIST VERT FEIT #1-4 - Wellbore #1 - Wellbore #1	10,822.95	6,350.00	593.24	477.94	5.145	CC, ES
EXIST VERT FEIT #1-4 - Wellbore #1 - Wellbore #1	10,900.00	6,350.00	598.22	480.90	5.099	SF
EXIST VERT FHA #2-1 - Wellbore #1 - Wellbore #1	14,844.09	6,599.52	1,011.08	778.52	4.347	CC
EXIST VERT FHA #2-1 - Wellbore #1 - Wellbore #1	14,900.00	6,599.39	1,012.63	778.49	4.325	ES
EXIST VERT FHA #2-1 - Wellbore #1 - Wellbore #1	15,000.00	6,599.17	1,023.03	786.10	4.318	SF
EXIST VERT FOOS #1-1614 - Wellbore #1 - Wellbore #1	0.00	0.00	2,778.13			
EXIST VERT FOOS #1-1614 - Wellbore #1 - Wellbore #1	300.00	275.74	2,778.71	2,777.97	3,783.770	ES
EXIST VERT FOOS #1-1614 - Wellbore #1 - Wellbore #1	16,726.85	6,900.00	9,871.98	9,587.63	34.718	SF
EXIST VERT FUEGO C #1-19 - Wellbore #1 - Wellbore #	10,240.96	6,550.00	220.95	116.91	2.124	CC, ES, SF
EXIST VERT HAPPY AMIGO C #1-25 - Wellbore #1 - W	10,248.90	6,600.00	3,296.32	3,191.77	31.527	CC
EXIST VERT HAPPY AMIGO C #1-25 - Wellbore #1 - W	10,300.00	6,600.00	3,296.72	3,190.75	31.110	ES
EXIST VERT HAPPY AMIGO C #1-25 - Wellbore #1 - W	13,200.00	6,575.49	4,424.28	4,237.49	23.686	SF
EXIST VERT HAPPY TALK #1 - Wellbore #1 - Wellbore	9,638.02	6,565.34	2,314.50	2,226.70	26.360	CC
EXIST VERT HAPPY TALK #1 - Wellbore #1 - Wellbore	9,700.00	6,564.73	2,315.33	2,225.82	25.868	ES
EXIST VERT HAPPY TALK #1 - Wellbore #1 - Wellbore	11,300.00	6,550.37	2,849.37	2,715.55	21.292	SF
EXIST VERT HAPPY TALK #2 - Wellbore #1 - Wellbore	9,592.34	6,600.00	3,604.23	3,518.09	41.843	CC
EXIST VERT HAPPY TALK #2 - Wellbore #1 - Wellbore	9,700.00	6,600.00	3,605.83	3,516.74	40.472	ES
EXIST VERT HAPPY TALK #2 - Wellbore #1 - Wellbore	13,900.00	6,600.00	5,616.64	5,410.57	27.256	SF
EXIST VERT HOFFMAN C #11-29 - Wellbore #1 - Wellb	15,564.99	6,700.00	4,047.94	3,794.97	16.001	CC
EXIST VERT HOFFMAN C #11-29 - Wellbore #1 - Wellb	15,700.00	6,700.00	4,050.20	3,793.44	15.774	ES
EXIST VERT HOFFMAN C #11-29 - Wellbore #1 - Wellb	16,726.85	6,700.00	4,211.39	3,925.83	14.748	SF
EXIST VERT HOSHIKO #1-2 - Wellbore #1 - Design #1	12,166.98	6,573.03	509.43	223.78	1.783	CC, ES
EXIST VERT HOSHIKO #1-2 - Wellbore #1 - Design #1	12,200.00	6,573.03	510.50	223.93	1.781	SF
EXIST VERT HOSHIKO #2-2 - Wellbore #1 - Design #1	13,577.81	6,597.03	103.10	-222.25	0.317	Level 1, CC, ES, SF
EXIST VERT HOSHIKO #7-2 - Wellbore #1 - Wellbore #1	13,663.10	6,583.97	805.93	606.41	4.039	CC
EXIST VERT HOSHIKO #7-2 - Wellbore #1 - Wellbore #1	13,700.00	6,584.14	806.77	606.23	4.023	ES
EXIST VERT HOSHIKO #7-2 - Wellbore #1 - Wellbore #1	13,800.00	6,584.58	817.47	614.13	4.020	SF

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

Company:	PDC ENERGY	Local Co-ordinate Reference:	Well RED CLOUD 4N
Project:	WELD COUNTY, COLORADO (TRUE)	TVD Reference:	KB-EST @ 4625.00usft (Original Well Elev)
Reference Site:	SE NE SEC. 1 T4N R64W 6th P.M. (RED CLOUD)	MD Reference:	KB-EST @ 4625.00usft (Original Well Elev)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	RED CLOUD 4N	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
SE SE SEC. 1 T4N R64W 6th P.M. (LINDSEY)						
EXIST VERT MCDERMED #1-1 - Wellbore #1 - Design #	7,011.35	6,558.31	206.75	56.36	1.375	Level 3, CC, ES, SF
EXIST VERT MCDERMED #2-1 - Wellbore #1 - Wellbore	8,276.03	6,546.20	264.36	213.49	5.197	CC, ES
EXIST VERT MCDERMED #2-1 - Wellbore #1 - Wellbore	8,300.00	6,546.17	265.44	213.96	5.155	SF
EXIST VERT MCFERREN #4-2 - Wellbore #1 - Design #	16,116.65	4,629.00	1,969.28	1,874.67	20.815	CC, ES
EXIST VERT MCFERREN #4-2 - Wellbore #1 - Design #	16,500.00	4,629.00	2,006.25	1,908.48	20.520	SF
EXIST VERT MCFERREN #5-2 - Wellbore #1 - Design #	16,129.03	6,601.01	1,022.06	740.69	3.632	CC, ES
EXIST VERT MCFERREN #5-2 - Wellbore #1 - Design #	16,200.00	6,601.01	1,024.52	741.16	3.616	SF
EXIST VERT MINOR #1 - Wellbore #1 - Wellbore #1	10,922.69	6,400.00	3,771.31	3,648.58	30.729	CC
EXIST VERT MINOR #1 - Wellbore #1 - Wellbore #1	11,000.00	6,400.00	3,772.10	3,647.23	30.207	ES
EXIST VERT MINOR #1 - Wellbore #1 - Wellbore #1	14,200.00	6,400.00	4,996.37	4,782.17	23.326	SF
EXIST VERT REIN #1 - Wellbore #1 - Wellbore #1	8,235.83	6,541.64	907.58	857.32	18.057	CC, ES
EXIST VERT REIN #1 - Wellbore #1 - Wellbore #1	8,700.00	6,539.09	1,019.38	956.86	16.305	SF
EXIST VERT REIN #1-8 - Wellbore #1 - Wellbore #1	706.89	684.56	471.20	469.34	253.663	CC, ES
EXIST VERT REIN #1-8 - Wellbore #1 - Wellbore #1	8,500.00	6,541.99	1,788.07	1,731.42	31.562	SF
EXIST VERT ROTHE #1 - Wellbore #1 - Wellbore #1	12,306.43	6,578.77	2,247.81	2,086.27	13.915	CC
EXIST VERT ROTHE #1 - Wellbore #1 - Wellbore #1	12,400.00	6,580.27	2,249.76	2,085.60	13.705	ES
EXIST VERT ROTHE #1 - Wellbore #1 - Wellbore #1	13,200.00	6,592.65	2,418.87	2,232.34	12.968	SF
EXIST VERT ROTHE #2 - Wellbore #1 - Wellbore #1	13,538.25	6,535.27	3,640.86	3,444.91	18.581	CC
EXIST VERT ROTHE #2 - Wellbore #1 - Wellbore #1	13,600.00	6,534.90	3,641.39	3,443.71	18.421	ES
EXIST VERT ROTHE #2 - Wellbore #1 - Wellbore #1	15,400.00	6,524.61	4,089.25	3,841.15	16.482	SF
EXIST VERT ROTHE #2-10 - Wellbore #1 - Wellbore #1	13,363.76	6,131.14	2,200.67	2,013.09	11.732	CC
EXIST VERT ROTHE #2-10 - Wellbore #1 - Wellbore #1	13,400.00	6,132.05	2,200.97	2,012.38	11.671	ES
EXIST VERT ROTHE #2-10 - Wellbore #1 - Wellbore #1	14,100.00	6,151.93	2,320.38	2,112.23	11.148	SF
EXIST VERT ROTHE #3 - Wellbore #1 - Wellbore #1	12,260.17	6,567.45	3,630.56	3,470.02	22.615	CC
EXIST VERT ROTHE #3 - Wellbore #1 - Wellbore #1	12,400.00	6,566.83	3,633.25	3,468.81	22.094	ES
EXIST VERT ROTHE #3 - Wellbore #1 - Wellbore #1	14,600.00	6,557.22	4,319.23	4,093.22	19.110	SF
EXIST VERT SPIKE STATE #CC6-12 - Wellbore #1 - De	700.00	677.00	2,187.90	2,175.19	172.131	CC
EXIST VERT SPIKE STATE #CC6-12 - Wellbore #1 - De	1,100.00	1,075.70	2,192.27	2,170.59	101.129	ES
EXIST VERT SPIKE STATE #CC6-12 - Wellbore #1 - De	6,450.00	6,297.33	2,524.87	2,382.83	17.776	SF
EXIST VERT SPIKE STATE #CC6-13 - Wellbore #1 - We	294.81	273.82	3,463.61	3,462.98	5,520.665	CC
EXIST VERT SPIKE STATE #CC6-13 - Wellbore #1 - We	600.00	562.97	3,464.00	3,462.51	2,324.270	ES
EXIST VERT SPIKE STATE #CC6-13 - Wellbore #1 - We	15,100.00	6,350.51	9,998.18	9,758.76	41.761	SF
LINDSEY 10N - ORIGINAL WELLBORE - PROPOSAL #	264.16	271.16	3,437.43	3,436.50	3,709.144	CC
LINDSEY 10N - ORIGINAL WELLBORE - PROPOSAL #	300.00	300.00	3,437.44	3,436.37	3,206.164	ES
LINDSEY 10N - ORIGINAL WELLBORE - PROPOSAL #	16,726.85	16,473.16	4,243.40	3,676.49	7.485	SF
LINDSEY 1C - ORIGINAL WELLBORE - PROPOSAL #1	16,645.88	17,061.53	1,865.44	1,303.79	3.321	CC
LINDSEY 1C - ORIGINAL WELLBORE - PROPOSAL #1	16,700.00	17,061.79	1,866.10	1,302.93	3.314	ES
LINDSEY 1C - ORIGINAL WELLBORE - PROPOSAL #1	16,726.85	17,061.79	1,867.01	1,303.09	3.311	SF
LINDSEY 2N - ORIGINAL WELLBORE - PROPOSAL #1	16,653.36	16,856.65	2,121.10	1,556.92	3.760	CC
LINDSEY 2N - ORIGINAL WELLBORE - PROPOSAL #1	16,700.00	16,856.65	2,121.60	1,556.12	3.752	ES
LINDSEY 2N - ORIGINAL WELLBORE - PROPOSAL #1	16,726.85	16,856.65	2,122.36	1,556.12	3.748	SF
LINDSEY 3N - ORIGINAL WELLBORE - PROPOSAL #1	16,654.97	16,822.59	2,386.58	1,822.08	4.228	CC
LINDSEY 3N - ORIGINAL WELLBORE - PROPOSAL #1	16,726.85	16,822.59	2,387.68	1,821.16	4.215	ES, SF
LINDSEY 4N - ORIGINAL WELLBORE - PROPOSAL #1	16,658.21	16,701.63	2,649.24	2,084.73	4.693	CC
LINDSEY 4N - ORIGINAL WELLBORE - PROPOSAL #1	16,726.85	16,701.63	2,650.13	2,083.69	4.679	ES, SF
LINDSEY 5N - ORIGINAL WELLBORE - PROPOSAL #1	16,659.04	16,694.71	2,914.82	2,350.09	5.161	CC
LINDSEY 5N - ORIGINAL WELLBORE - PROPOSAL #1	16,726.85	16,694.71	2,915.60	2,348.97	5.146	ES, SF
LINDSEY 6N - ORIGINAL WELLBORE - PROPOSAL #1	16,659.89	16,594.46	3,181.06	2,616.42	5.634	CC
LINDSEY 6N - ORIGINAL WELLBORE - PROPOSAL #1	16,726.85	16,594.46	3,181.76	2,615.25	5.616	ES, SF
LINDSEY 7N - ORIGINAL WELLBORE - PROPOSAL #1	3,659.08	4,100.00	3,324.98	3,300.88	137.965	CC
LINDSEY 7N - ORIGINAL WELLBORE - PROPOSAL #1	16,726.85	16,630.53	3,447.27	2,880.34	6.081	ES, SF
LINDSEY 8N - ORIGINAL WELLBORE - PROPOSAL #1	700.00	708.00	3,408.36	3,405.47	1,180.080	CC

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 RED CLOUD 4N
Project:	WELD COUNTY, COLORADO (TRUE)	TVD Reference:	KB-EST @ 4625.00usft (Original Well Elev)
Reference Site:	SE NE SEC. 1 T4N R64W 6th P.M. (RED CLOUD)	MD Reference:	KB-EST @ 4625.00usft (Original Well Elev)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	RED CLOUD 4N	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
Offset Well - Wellbore - Design						
SE SE SEC. 1 T4N R64W 6th P.M. (LINDSEY)						
LINDSEY 8N - ORIGINAL WELLBORE - PROPOSAL #1	16,726.85	16,558.58	3,709.78	3,142.61	6.541	ES, SF
LINDSEY 9N - ORIGINAL WELLBORE - PROPOSAL #1	364.16	371.16	3,422.89	3,421.52	2,487.067	CC
LINDSEY 9N - ORIGINAL WELLBORE - PROPOSAL #1	16,726.85	16,608.36	3,975.36	3,407.78	7.004	ES, SF

Offset Design

SE NE SEC. 1 T4N R64W 6th P.M. (RED CLOUD) - EXIST HZ SOONER STATE B #36-63HN - Wellbo												Offset Site Error:	0.00 usft
Survey Program: 572-MWD												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	24.59	1,795.07	821.50	1,974.12				
100.00	100.00	99.00	99.00	0.09	0.11	24.59	1,795.07	821.50	1,974.12	1,973.93	0.19	N/A	
200.00	200.00	199.00	199.00	0.31	0.22	24.59	1,795.07	821.50	1,974.12	1,973.59	0.53	3,750.643	
300.00	300.00	299.00	299.00	0.54	0.32	24.59	1,795.07	821.50	1,974.12	1,973.26	0.86	2,297.710	
400.00	400.00	399.00	399.00	0.76	0.43	24.59	1,795.07	821.50	1,974.12	1,972.93	1.19	1,656.148	
500.00	500.00	499.00	499.00	0.99	0.54	24.59	1,795.07	821.50	1,974.12	1,972.60	1.52	1,294.656	
600.00	600.00	599.55	599.55	1.21	0.68	24.59	1,795.09	821.45	1,974.12	1,972.23	1.89	1,045.572	
700.00	700.00	703.56	703.55	1.44	0.89	24.57	1,795.32	820.67	1,974.01	1,971.68	2.33	848.455	
800.00	799.98	808.91	808.90	1.66	1.10	-24.19	1,795.31	819.76	1,972.05	1,969.29	2.76	714.946	
900.00	899.84	906.89	906.87	1.88	1.30	-24.32	1,795.19	818.87	1,966.78	1,963.60	3.18	618.158	
1,000.00	999.45	1,008.99	1,008.98	2.11	1.52	-24.52	1,795.16	817.84	1,958.40	1,954.78	3.62	540.772	
1,100.00	1,098.70	1,112.25	1,112.23	2.37	1.73	-24.80	1,794.94	816.71	1,946.67	1,942.60	4.07	478.477	
1,200.00	1,197.47	1,208.00	1,207.97	2.65	1.94	-25.15	1,794.75	815.43	1,931.75	1,927.24	4.51	428.462	
1,300.00	1,295.62	1,253.13	1,253.09	2.98	2.03	-25.42	1,795.24	815.17	1,915.20	1,910.34	4.85	394.663	
1,400.00	1,393.44	1,300.00	1,299.93	3.25	2.13	-25.55	1,796.82	815.81	1,899.89	1,894.68	5.21	364.531	
1,500.00	1,491.25	1,341.15	1,340.99	3.73	2.22	-25.66	1,799.27	816.91	1,887.45	1,881.88	5.57	338.801	
1,600.00	1,589.07	1,392.00	1,391.60	4.13	2.34	-25.80	1,803.86	818.63	1,878.01	1,872.06	5.95	315.434	
1,700.00	1,686.88	1,466.97	1,466.06	4.54	2.51	-26.05	1,812.27	820.95	1,870.64	1,864.24	6.41	292.022	
1,800.00	1,784.70	1,525.34	1,523.95	4.96	2.65	-26.26	1,819.61	822.36	1,864.56	1,857.73	6.83	273.027	
1,900.00	1,882.51	1,577.00	1,574.99	5.38	2.78	-26.45	1,827.40	824.11	1,861.09	1,853.85	7.24	256.913	
1,992.93	1,973.41	1,629.59	1,626.73	5.77	2.93	-26.64	1,836.49	826.27	1,860.11	1,852.46	7.65	243.246	CC
2,000.00	1,980.33	1,633.68	1,630.76	5.80	2.94	-26.66	1,837.24	826.45	1,860.11	1,852.43	7.68	242.270	
2,100.00	2,078.14	1,669.00	1,665.39	6.23	3.05	-26.79	1,843.97	828.06	1,861.65	1,853.59	8.06	230.881	
2,200.00	2,175.96	1,761.00	1,755.05	6.67	3.36	-27.14	1,863.95	833.06	1,865.46	1,856.86	8.60	217.010	
2,300.00	2,273.77	1,830.79	1,822.73	7.10	3.62	-27.41	1,880.50	837.06	1,871.06	1,861.98	9.08	206.059	
2,400.00	2,371.59	1,898.72	1,888.54	7.54	3.88	-27.69	1,896.93	840.63	1,877.45	1,867.88	9.57	196.276	
2,500.00	2,469.40	1,959.46	1,947.03	7.98	4.13	-27.94	1,912.89	844.36	1,886.06	1,876.03	10.04	187.910	
2,600.00	2,567.22	2,049.93	2,033.81	8.42	4.55	-28.31	1,937.90	849.86	1,896.12	1,885.52	10.60	178.864	
2,700.00	2,665.03	2,225.93	2,203.84	8.86	5.29	-29.06	1,982.46	858.23	1,903.13	1,891.75	11.37	167.330	
2,800.00	2,762.84	2,326.78	2,301.67	9.31	5.72	-29.47	2,006.51	862.97	1,909.28	1,897.32	11.96	159.641	
2,900.00	2,860.66	2,391.94	2,364.75	9.75	6.01	-29.73	2,022.51	866.36	1,916.36	1,903.90	12.46	153.789	
3,000.00	2,958.47	2,457.92	2,428.33	10.19	6.33	-29.97	2,039.54	870.90	1,925.26	1,912.30	12.97	148.453	
3,100.00	3,056.29	2,527.07	2,494.63	10.64	6.68	-30.23	2,058.61	875.48	1,935.89	1,922.40	13.49	143.484	
3,200.00	3,154.10	2,621.11	2,584.58	11.08	7.17	-30.62	2,085.51	880.94	1,947.41	1,933.31	14.10	138.119	
3,300.00	3,251.92	2,711.78	2,671.19	11.53	7.66	-31.01	2,111.92	885.60	1,959.34	1,944.64	14.70	133.264	
3,400.00	3,349.73	2,818.86	2,773.48	11.98	8.23	-31.48	2,143.21	890.59	1,971.34	1,955.98	15.36	128.359	
3,500.00	3,447.55	2,925.86	2,875.81	12.42	8.80	-31.95	2,174.16	894.97	1,983.01	1,966.99	16.01	123.831	
3,600.00	3,545.36	3,131.49	3,073.88	12.87	9.78	-32.84	2,228.71	902.58	1,992.76	1,975.82	16.94	117.630	
3,700.00	3,643.18	3,253.05	3,192.14	13.32	10.30	-33.31	2,256.41	907.40	1,998.54	1,980.93	17.61	113.476	

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