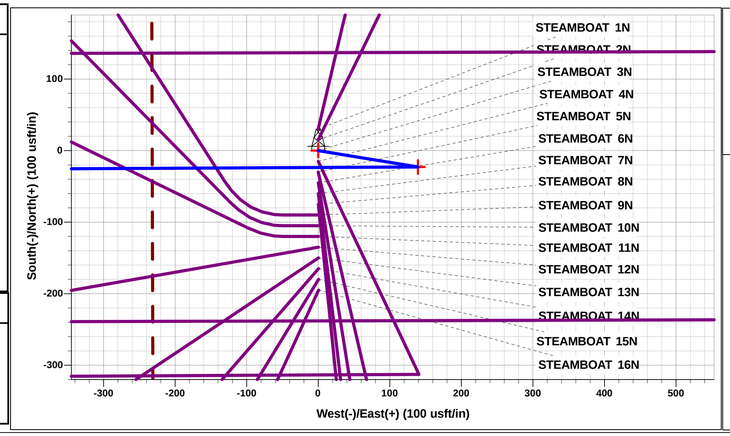
Project: WELD COUNTY, COLORADO (TRUE)
Site: NW SE SEC. 34 T4N R66W 6th P.M. (STEAMBOAT)
Well: STEAMBOAT 3N
Wellbore: ORIGINAL WELLBORE
Design: PROPOSAL #1

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: 1693ft FSL & 2432ft FEL of Sec 34
1200.00	1200.00	0.00	0.00	0.00	0.00	0.00	0.00	START NUDGE (2°/100ft BUR)
1795.62	1800.00	12.00	99.29	-10.11	61.78	-61.70	62.60	EOB TO 12° INC
1871.46	1877.53	12.00	99.29	-12.71	77.69	-77.58	78.72	END OF TANGENT
2467.08	2477.53	0.00	0.00	-22.82	139.47	-139.28	141.32	EOD TO VERTICAL
6496.80	6507.25	0.00	0.00	-22.82	139.47	-139.28	141.32	KOP (8°/100ft BUR)
7188.59	7444.74	75.00	269.70	-25.60	-391.35	391.54	672.15	EP: 1670ft FSL & 2500ft FWL of Sec 34
7213.00	7632.25	90.00	269.70	-26.57	-576.72	576.91	857.52	HZ LANDING POINT
7213.00	15551.02	90.00	269.70	-68.12	-8495.38	8495.65	8776.29	BHL: 1670ft FSL & 300ft FEL of Sec 32

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude
KOP - STEAMBOAT 3N	6496.80	-22.82	139.47	40.265608°N	104.762057°W
EP - STEAMBOAT 3N	7188.59	-25.60	-391.35	40.265601°N	104.763959°W
BHL - STEAMBOAT 3N	7213.00	-68.12	-8495.38	40.265480°N	104.792998°W
SHL - STEAMBOAT 3N	0.00	0.00	0.00	40.265671°N	104.762557°W

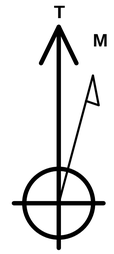


PROPOSED LOCAL COORDINATES:

SHL: 1693ft FSL & 2432ft FEL of Sec 34

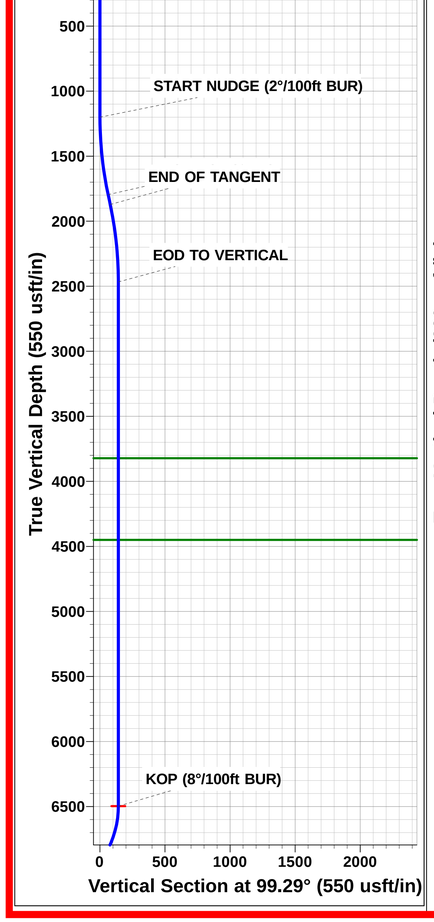
EP: 1670ft FSL & 2500ft FWL of Sec 34

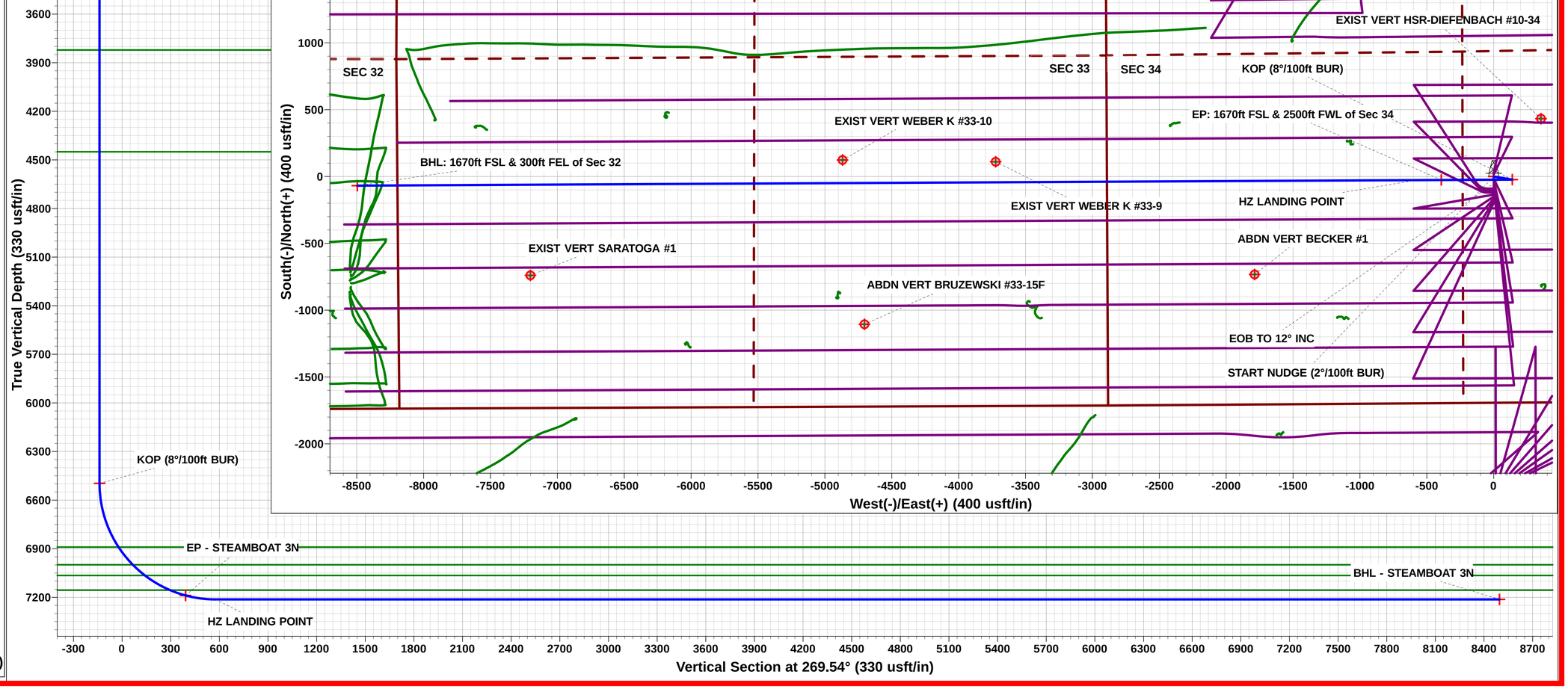
BHL: 1670ft FSL & 300ft FEL of Sec 32



Azimuths to True North
Magnetic North: 8.03°

Magnetic Field
Strength: 52139.6snT
Dip Angle: 66.71°
Date: 24/01/2019
Model: IGRF2015





PDC ENERGY

WELD COUNTY, COLORADO (TRUE)
NW SE SEC. 34 T4N R66W 6th P.M. (STEAMBOAT)
STEAMBOAT 3N

ORIGINAL WELLBORE
PROPOSAL #1

Anticollision Report

25 January, 2019

Company:	PDC ENERGY	**Local Co-ordinate Reference:**	Well STEAMBOAT 3N
Project:	WELD COUNTY, COLORADO (TRUE)	**TVD Reference:**	KB 23' @ 4863.00usft (Original Well Elev)
Reference Site:	NW SE SEC. 34 T4N R66W 6th P.M. (STEAMBOAT)	**MD Reference:**	KB 23' @ 4863.00usft (Original Well Elev)
Site Error:	0.00 usft	**North Reference:**	True
Reference Well:	STEAMBOAT 3N	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	ORIGINAL WELLBORE	**Database:**	Database 1
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** 25/01/2019

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.00	15,551.02	PROPOSAL #1 (ORIGINAL WELLBORE)	MWD	MWD - Standard

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
NE NE SEC 2 T3N R66W 6th P.M. (CHEYENNE)						
CHEYENNE 1N - ORIGINAL WELLBORE - PROPOSAL	6,361.80	6,602.44	5,202.10	5,155.35	111.264	CC
CHEYENNE 1N - ORIGINAL WELLBORE - PROPOSAL	6,400.00	6,627.90	5,202.12	5,155.26	111.008	ES
CHEYENNE 1N - ORIGINAL WELLBORE - PROPOSAL	11,700.00	6,918.73	9,934.55	9,785.04	66.445	SF
CHEYENNE 2N - ORIGINAL WELLBORE - PROPOSAL	6,459.48	6,627.52	5,537.67	5,496.37	134.091	CC
CHEYENNE 2N - ORIGINAL WELLBORE - PROPOSAL	6,500.00	6,650.30	5,537.70	5,496.28	133.717	ES
CHEYENNE 2N - ORIGINAL WELLBORE - PROPOSAL	11,400.00	6,900.00	9,974.25	9,835.70	71.993	SF
CHEYENNE 3N - ORIGINAL WELLBORE - PROPOSAL	6,361.80	6,484.26	5,861.76	5,825.70	162.528	CC
CHEYENNE 3N - ORIGINAL WELLBORE - PROPOSAL	6,400.00	6,509.72	5,861.78	5,825.59	161.991	ES
CHEYENNE 3N - ORIGINAL WELLBORE - PROPOSAL	11,000.00	6,800.00	9,912.24	9,790.00	81.086	SF
CHEYENNE 4N - ORIGINAL WELLBORE - PROPOSAL	6,465.73	6,567.55	6,177.45	6,144.82	189.309	CC
CHEYENNE 4N - ORIGINAL WELLBORE - PROPOSAL	6,550.00	6,618.34	6,178.84	6,143.91	176.847	ES
CHEYENNE 4N - ORIGINAL WELLBORE - PROPOSAL	10,700.00	6,850.00	9,928.96	9,815.38	87.418	SF
CHEYENNE 5N - ORIGINAL WELLBORE - PROPOSAL	6,361.80	6,455.82	6,481.52	6,451.70	217.306	CC
CHEYENNE 5N - ORIGINAL WELLBORE - PROPOSAL	6,550.00	6,550.00	6,484.09	6,448.87	184.105	ES
CHEYENNE 5N - ORIGINAL WELLBORE - PROPOSAL	10,400.00	6,771.40	9,944.69	9,842.27	97.097	SF
CHEYENNE 6N - ORIGINAL WELLBORE - PROPOSAL	3,466.71	3,528.71	6,777.46	6,761.08	413.837	CC
CHEYENNE 6N - ORIGINAL WELLBORE - PROPOSAL	6,550.00	6,600.00	6,787.78	6,751.78	188.559	ES
CHEYENNE 6N - ORIGINAL WELLBORE - PROPOSAL	10,100.00	6,850.00	9,950.02	9,852.93	102.490	SF
CHEYENNE 7N - ORIGINAL WELLBORE - PROPOSAL	2,309.00	1,935.67	6,898.45	6,887.37	622.883	CC, ES
CHEYENNE 7N - ORIGINAL WELLBORE - PROPOSAL	9,700.00	6,800.00	9,915.29	9,827.45	112.881	SF
CHEYENNE 8N - ORIGINAL WELLBORE - PROPOSAL	260.78	275.78	6,969.53	6,968.60	7,497.648	CC
CHEYENNE 8N - ORIGINAL WELLBORE - PROPOSAL	2,139.44	1,346.95	6,976.72	6,968.25	824.080	ES
CHEYENNE 8N - ORIGINAL WELLBORE - PROPOSAL	9,400.00	6,900.00	9,989.63	9,903.75	116.324	SF
EXIST DD LORENZ #39-35 - Wellbore #1 - Wellbore #1	2,328.81	1,945.00	7,238.03	7,228.86	789.522	CC, ES
EXIST DD LORENZ #39-35 - Wellbore #1 - Wellbore #1	9,400.00	7,356.44	9,974.90	9,889.85	117.288	SF
EXIST DD MILE HIGH #30-2 - Wellbore #1 - Wellbore #1	6,507.25	6,583.00	2,906.58	2,875.20	92.622	ES
EXIST DD MILE HIGH #30-2 - Wellbore #1 - Wellbore #1	6,512.60	6,590.77	2,906.56	2,878.44	103.354	CC
EXIST DD MILE HIGH #30-2 - Wellbore #1 - Wellbore #1	14,400.00	7,546.00	9,951.82	9,729.61	44.785	SF
EXIST VERT HSR-BACANSKAS #13-35 - Wellbore #1 -	5,655.71	5,647.24	3,180.80	3,166.79	227.007	CC
EXIST VERT HSR-BACANSKAS #13-35 - Wellbore #1 -	5,800.00	5,783.73	3,181.07	3,166.72	221.619	ES
EXIST VERT HSR-BACANSKAS #13-35 - Wellbore #1 -	13,800.00	7,200.00	9,948.30	9,756.12	51.766	SF
EXIST VERT HSR-BANCROFT #15-35 - Wellbore #1 - W	6,427.38	6,400.00	5,808.43	5,792.49	364.339	CC
EXIST VERT HSR-BANCROFT #15-35 - Wellbore #1 - W	6,500.00	6,456.80	5,808.54	5,792.43	360.461	ES
EXIST VERT HSR-BANCROFT #15-35 - Wellbore #1 - W	11,100.00	7,079.03	9,952.80	9,836.58	85.636	SF
EXIST VERT LORENZ #14-35 - Wellbore #1 - Wellbore #	6,515.27	6,544.08	4,541.40	4,525.17	279.845	CC, ES
EXIST VERT LORENZ #14-35 - Wellbore #1 - Wellbore #	12,400.00	7,150.00	9,937.82	9,785.04	65.045	SF

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

Company:	PDC ENERGY	**Local Co-ordinate Reference:**	Well STEAMBOAT 3N
Project:	WELD COUNTY, COLORADO (TRUE)	**TVD Reference:**	KB 23' @ 4863.00usft (Original Well Elev)
Reference Site:	NW SE SEC. 34 T4N R66W 6th P.M. (STEAMBOAT)	**MD Reference:**	KB 23' @ 4863.00usft (Original Well Elev)
Site Error:	0.00 usft	**North Reference:**	True
Reference Well:	STEAMBOAT 3N	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	ORIGINAL WELLBORE	**Database:**	Database 1
Reference Design:	PROPOSAL #1	**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
NE NE SEC 2 T3N R66W 6th P.M. (CHEYENNE)						
EXIST VERT LORENZ #16-35 - Wellbore #1 - Wellbore #	6,514.61	6,577.94	7,074.28	7,057.93	432.650	CC, ES
EXIST VERT LORENZ #16-35 - Wellbore #1 - Wellbore #	9,800.00	7,282.61	9,924.21	9,843.47	122.928	SF

Company:	PDC ENERGY	**Local Co-ordinate Reference:**	Well STEAMBOAT 3N
Project:	WELD COUNTY, COLORADO (TRUE)	**TVD Reference:**	KB 23' @ 4863.00usft (Original Well Elev)
Reference Site:	NW SE SEC. 34 T4N R66W 6th P.M. (STEAMBOAT)	**MD Reference:**	KB 23' @ 4863.00usft (Original Well Elev)
Site Error:	0.00 usft	**North Reference:**	True
Reference Well:	STEAMBOAT 3N	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	ORIGINAL WELLBORE	**Database:**	Database 1
Reference Design:	PROPOSAL #1	**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
NE NW SEC 34 T4N R66W 6th P.M. (CHATFIELD)						
ABDN DD PIERSON #21-34 - Wellbore #1 - Wellbore #1	7,358.41	7,148.00	2,389.11	2,355.49	71.063	CC
ABDN DD PIERSON #21-34 - Wellbore #1 - Wellbore #1	7,400.00	7,161.05	2,389.44	2,355.20	69.793	ES
ABDN DD PIERSON #21-34 - Wellbore #1 - Wellbore #1	13,600.00	7,225.13	6,678.60	6,478.42	33.363	SF
ABDN DD PIERSON #27-34 - Wellbore #1 - Wellbore #1	660.49	595.51	2,849.39	2,847.00	1,195.853	CC
ABDN DD PIERSON #27-34 - Wellbore #1 - Wellbore #1	700.00	618.79	2,849.50	2,846.98	1,130.879	ES
ABDN DD PIERSON #27-34 - Wellbore #1 - Wellbore #1	15,200.00	7,440.00	9,969.82	9,712.12	38.689	SF
ABDN DD PIERSON #28-34 - Wellbore #1 - Wellbore #1	178.58	99.49	2,854.12	2,853.84	10,000.000	CC
ABDN DD PIERSON #28-34 - Wellbore #1 - Wellbore #1	500.00	411.77	2,854.69	2,853.48	2,363.252	ES
ABDN DD PIERSON #28-34 - Wellbore #1 - Wellbore #1	15,551.02	7,241.27	9,023.39	8,781.77	37.345	SF
ABDN VERT AGRI PROD INC FED #32-7F - Wellbore #	15,551.02	7,083.20	2,360.35	2,119.33	9.793	CC, ES, SF
ABDN VERT AGRI PROD INC FED #32-8F - Wellbore #	15,551.02	7,130.03	1,505.23	1,264.19	6.245	CC, ES, SF
ABDN VERT BECKER #1 - Wellbore #1 - Design #1	8,846.15	7,156.00	699.63	505.09	3.596	CC, ES
ABDN VERT BECKER #1 - Wellbore #1 - Design #1	8,900.00	7,156.00	701.70	505.72	3.580	SF
ABDN VERT DEROO WILFRED #1 - Wellbore #1 - Well	15,551.02	7,131.65	2,018.41	1,777.32	8.372	CC, ES, SF
ABDN VERT FRANK #21-32 - Wellbore #1 - Wellbore #1	15,551.02	7,119.55	3,890.63	3,649.50	16.135	CC, ES, SF
ABDN VERT HEITMAN K #34-4 - Wellbore #1 - Wellbore	9,396.37	7,119.88	3,065.02	2,995.23	43.917	CC
ABDN VERT HEITMAN K #34-4 - Wellbore #1 - Wellbore	9,500.00	7,119.36	3,066.77	2,994.15	42.229	ES
ABDN VERT HEITMAN K #34-4 - Wellbore #1 - Wellbore	13,200.00	7,101.04	4,884.83	4,709.37	27.839	SF
ABDN VERT HSR-SPILMAN #9-35 - Wellbore #1 - Wellb	6,191.74	6,142.92	6,887.83	6,872.62	452.780	CC
ABDN VERT HSR-SPILMAN #9-35 - Wellbore #1 - Wellb	6,200.00	6,148.18	6,887.83	6,872.60	452.240	ES
ABDN VERT HSR-SPILMAN #9-35 - Wellbore #1 - Wellb	10,000.00	7,127.07	9,972.37	9,886.67	116.365	SF
ABDN VERT JOHNSON UPRR #31-35 - Wellbore #1 - W	6,226.25	6,150.26	6,188.00	6,172.79	407.038	CC, ES
ABDN VERT JOHNSON UPRR #31-35 - Wellbore #1 - W	11,000.00	6,900.00	9,978.39	9,864.84	87.880	SF
ABDN VERT RAYMOND MARTIN GU #1 - Wellbore #1 -	4,737.37	4,643.62	2,022.81	2,011.25	174.923	CC
ABDN VERT RAYMOND MARTIN GU #1 - Wellbore #1 -	6,515.62	6,430.27	2,023.30	2,007.24	125.920	ES
ABDN VERT RAYMOND MARTIN GU #1 - Wellbore #1 -	15,551.02	7,182.26	9,494.83	9,253.75	39.385	SF
ABDN VERT SWEET VALLEY FARMS-UPRR #41-33 - W	10,542.38	7,124.00	2,943.77	2,702.09	12.181	CC
ABDN VERT SWEET VALLEY FARMS-UPRR #41-33 - W	10,600.00	7,124.00	2,944.33	2,701.06	12.103	ES
ABDN VERT SWEET VALLEY FARMS-UPRR #41-33 - W	11,500.00	7,124.00	3,095.61	2,827.31	11.538	SF
ABDN VERT TANNER K FED #33-12 - Wellbore #1 - We	14,668.81	7,125.95	432.32	215.87	1.997	CC, ES
ABDN VERT TANNER K FED #33-12 - Wellbore #1 - We	14,700.00	7,125.70	433.44	216.11	1.994	SF
ABDN VERT UPRR 21 PAN AM K #1 - Wellbore #1 - De	6,507.25	6,451.80	4,380.30	4,238.66	30.926	CC, ES
ABDN VERT UPRR 21 PAN AM K #1 - Wellbore #1 - De	6,600.00	6,544.29	4,386.26	4,243.95	30.822	SF
CHATFIELD 10N - ORIGINAL WELLBORE - PROPOSA	8,512.75	7,404.92	2,613.20	2,546.24	39.028	CC
CHATFIELD 10N - ORIGINAL WELLBORE - PROPOSA	8,700.00	7,259.85	2,614.69	2,544.26	37.126	ES
CHATFIELD 10N - ORIGINAL WELLBORE - PROPOSA	11,600.00	6,550.00	3,651.32	3,505.78	25.087	SF
CHATFIELD 11N - ORIGINAL WELLBORE - PROPOSAL	8,001.51	8,004.13	2,303.64	2,241.12	36.843	CC
CHATFIELD 11N - ORIGINAL WELLBORE - PROPOSAL	8,100.00	7,959.48	2,304.73	2,240.70	35.992	ES
CHATFIELD 11N - ORIGINAL WELLBORE - PROPOSAL	11,100.00	6,650.00	3,102.23	2,969.73	23.412	SF
CHATFIELD 12N - ORIGINAL WELLBORE - PROPOSA	8,498.85	7,461.39	1,995.06	1,928.21	29.844	CC
CHATFIELD 12N - ORIGINAL WELLBORE - PROPOSA	8,700.00	7,300.00	1,997.31	1,926.64	28.262	ES
CHATFIELD 12N - ORIGINAL WELLBORE - PROPOSA	10,400.00	6,700.00	2,445.12	2,332.04	21.622	SF
CHATFIELD 13N - ORIGINAL WELLBORE - PROPOSA	8,527.02	7,570.95	1,680.21	1,612.35	24.763	CC
CHATFIELD 13N - ORIGINAL WELLBORE - PROPOSA	8,700.00	7,424.87	1,681.61	1,610.39	23.611	ES
CHATFIELD 13N - ORIGINAL WELLBORE - PROPOSA	9,900.00	6,900.00	1,923.06	1,822.32	19.089	SF
CHATFIELD 14N - ORIGINAL WELLBORE - PROPOSA	7,100.00	8,953.55	1,366.52	1,299.66	20.440	ES
CHATFIELD 14N - ORIGINAL WELLBORE - PROPOSA	7,145.49	8,919.10	1,366.21	1,300.01	20.636	CC
CHATFIELD 14N - ORIGINAL WELLBORE - PROPOSA	9,600.00	7,000.00	1,542.80	1,451.83	16.960	SF
CHATFIELD 15N - ORIGINAL WELLBORE - PROPOSA	8,180.17	8,101.98	1,073.78	1,010.00	16.836	CC
CHATFIELD 15N - ORIGINAL WELLBORE - PROPOSA	8,200.00	8,101.98	1,073.88	1,009.61	16.709	ES
CHATFIELD 15N - ORIGINAL WELLBORE - PROPOSA	9,300.00	7,250.00	1,167.44	1,083.12	13.846	SF
CHATFIELD 8N - ORIGINAL WELLBORE - PROPOSAL	647.92	583.92	2,904.51	2,902.02	1,165.402	CC, ES

Company:	PDC ENERGY	**Local Co-ordinate Reference:**	Well STEAMBOAT 3N
Project:	WELD COUNTY, COLORADO (TRUE)	**TVD Reference:**	KB 23' @ 4863.00usft (Original Well Elev)
Reference Site:	NW SE SEC. 34 T4N R66W 6th P.M. (STEAMBOAT)	**MD Reference:**	KB 23' @ 4863.00usft (Original Well Elev)
Site Error:	0.00 usft	**North Reference:**	True
Reference Well:	STEAMBOAT 3N	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	ORIGINAL WELLBORE	**Database:**	Database 1
Reference Design:	PROPOSAL #1	**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
NE NW SEC 34 T4N R66W 6th P.M. (CHATFIELD)						
CHATFIELD 8N - ORIGINAL WELLBORE - PROPOSAL	12,600.00	6,523.82	4,806.31	4,630.97	27.411	SF
CHATFIELD 9N - ORIGINAL WELLBORE - PROPOSAL	548.72	483.72	2,910.64	2,908.60	1,423.919	CC
CHATFIELD 9N - ORIGINAL WELLBORE - PROPOSAL	8,800.00	7,250.00	2,925.56	2,852.37	39.972	ES
CHATFIELD 9N - ORIGINAL WELLBORE - PROPOSAL	12,200.00	6,600.00	4,274.87	4,110.82	26.057	SF
CHATFIELD FEDERAL 1N - ORIGINAL WELLBORE - P	147.92	83.92	2,841.20	2,840.93	10,000.000	CC, ES
CHATFIELD FEDERAL 1N - ORIGINAL WELLBORE - P	15,551.02	14,237.41	3,346.12	2,899.00	7.484	SF
CHATFIELD FEDERAL 2N - ORIGINAL WELLBORE - P	447.92	383.92	2,846.62	2,845.03	1,786.711	CC
CHATFIELD FEDERAL 2N - ORIGINAL WELLBORE - P	15,551.02	14,280.04	2,893.54	2,446.17	6.468	ES, SF
CHATFIELD FEDERAL 3N - ORIGINAL WELLBORE - P	8,724.93	7,366.41	2,562.84	2,491.04	35.693	CC
CHATFIELD FEDERAL 3N - ORIGINAL WELLBORE - P	15,551.02	14,185.63	2,607.75	2,161.26	5.841	ES, SF
CHATFIELD FEDERAL 4N - ORIGINAL WELLBORE - P	8,678.72	7,440.03	2,266.93	2,197.27	32.543	CC
CHATFIELD FEDERAL 4N - ORIGINAL WELLBORE - P	15,551.02	14,306.83	2,314.12	1,867.23	5.178	ES, SF
CHATFIELD FEDERAL 5N - ORIGINAL WELLBORE - P	8,714.58	7,429.87	1,944.70	1,873.72	27.399	CC
CHATFIELD FEDERAL 5N - ORIGINAL WELLBORE - P	15,551.02	14,259.61	1,994.51	1,548.94	4.476	ES, SF
CHATFIELD FEDERAL 6N - ORIGINAL WELLBORE - P	8,697.13	7,529.38	1,627.79	1,556.78	22.925	CC
CHATFIELD FEDERAL 6N - ORIGINAL WELLBORE - P	15,551.02	14,379.67	1,704.69	1,258.25	3.818	ES, SF
CHATFIELD FEDERAL 7N - ORIGINAL WELLBORE - P	8,725.64	7,578.41	1,266.87	1,194.86	17.592	CC
CHATFIELD FEDERAL 7N - ORIGINAL WELLBORE - P	15,551.02	14,398.77	1,293.43	850.24	2.918	ES, SF
EXIST DD HUNT K FEDERAL #33-19 - Wellbore #1 - W	13,884.95	7,244.92	2,300.62	2,103.68	11.682	CC
EXIST DD HUNT K FEDERAL #33-19 - Wellbore #1 - W	13,900.00	7,244.62	2,300.66	2,103.31	11.657	ES
EXIST DD HUNT K FEDERAL #33-19 - Wellbore #1 - W	14,600.00	7,231.11	2,409.13	2,192.17	11.104	SF
EXIST DD PIERSON #18-34 - Wellbore #1 - Wellbore #1	8,588.10	7,375.86	2,294.65	2,219.01	30.337	CC
EXIST DD PIERSON #18-34 - Wellbore #1 - Wellbore #1	8,600.00	7,375.78	2,294.68	2,218.73	30.213	ES
EXIST DD PIERSON #18-34 - Wellbore #1 - Wellbore #1	10,500.00	7,362.48	2,986.74	2,859.00	23.381	SF
EXIST DD PIERSON #22-34 - Wellbore #1 - Wellbore #1	8,554.94	7,640.74	1,046.48	970.17	13.714	CC
EXIST DD PIERSON #22-34 - Wellbore #1 - Wellbore #1	8,600.00	7,640.33	1,047.45	969.96	13.518	ES
EXIST DD PIERSON #22-34 - Wellbore #1 - Wellbore #1	8,900.00	7,637.66	1,101.90	1,016.45	12.895	SF
EXIST DD PIERSON #29-34 - Wellbore #1 - Wellbore #1	100.00	32.06	2,855.88	2,855.78	10,000.000	CC
EXIST DD PIERSON #29-34 - Wellbore #1 - Wellbore #1	200.00	123.64	2,856.13	2,855.77	7,924.470	ES
EXIST DD PIERSON #29-34 - Wellbore #1 - Wellbore #1	13,000.00	7,399.48	5,566.82	5,367.66	27.953	SF
EXIST HZ PEAKS #K26-77-1HN - Wellbore #1 - Wellbor	2,238.61	1,938.00	4,407.46	4,399.25	536.590	CC, ES
EXIST HZ PEAKS #K26-77-1HN - Wellbore #1 - Wellbor	12,400.00	5,918.00	9,987.21	9,830.95	63.914	SF
EXIST HZ PEAKS #K26-78-1HN - Wellbore #1 - Wellbor	2,145.66	1,748.00	4,413.69	4,405.64	548.858	CC, ES
EXIST HZ PEAKS #K26-78-1HN - Wellbore #1 - Wellbor	12,900.00	6,672.00	9,990.62	9,812.68	56.145	SF
EXIST HZ PEPPLER #K26-79-1HN - Wellbore #1 - Wellb	2,525.64	2,463.63	4,340.41	4,330.58	441.311	CC, ES
EXIST HZ PEPPLER #K26-79-1HN - Wellbore #1 - Wellb	13,500.00	6,913.00	9,960.32	9,760.61	49.875	SF
EXIST HZ TANNER FED #K33-65HN - Wellbore #1 - We	12,568.04	9,452.85	965.93	740.20	4.279	CC
EXIST HZ TANNER FED #K33-65HN - Wellbore #1 - We	12,600.00	9,436.23	966.18	740.01	4.272	ES
EXIST HZ TANNER FED #K33-65HN - Wellbore #1 - We	12,700.00	9,395.00	970.36	742.52	4.259	SF
EXIST HZ TARIN FED #32W-234 - Wellbore #1 - Wellbo	15,551.02	7,185.00	706.78	461.22	2.878	CC, ES, SF
EXIST HZ WIEDMAN #29O-243 - Wellbore #1 - Wellbore	15,551.02	11,542.00	2,965.49	2,700.92	11.209	CC, ES, SF
EXIST VERT AGRI PROD FED #32-17 - Wellbore #1 - D	15,551.02	7,121.00	2,308.54	1,926.93	6.049	CC, ES, SF
EXIST VERT AGRI PROD INC #32-1F - Wellbore #1 - D	15,551.02	7,124.00	2,887.85	2,506.21	7.567	CC, ES, SF
EXIST VERT AGRI PROD INC #32-2F - Wellbore #1 - D	15,551.02	7,132.00	3,428.47	3,046.75	8.982	CC, ES, SF
EXIST VERT BERIG #17-35 - Wellbore #1 - Design #1	6,507.25	6,445.80	6,703.93	6,562.40	47.366	CC, ES
EXIST VERT BERIG #17-35 - Wellbore #1 - Design #1	10,300.00	7,162.00	9,926.13	9,691.79	42.358	SF
EXIST VERT BIERIG UPRR #41-35 #2 - Wellbore #1 - W	6,507.25	6,460.49	7,558.65	7,542.58	470.332	ES
EXIST VERT BIERIG UPRR #41-35 #2 - Wellbore #1 - W	6,510.38	6,464.07	7,558.65	7,542.59	470.908	CC
EXIST VERT BIERIG UPRR #41-35 #2 - Wellbore #1 - W	9,500.00	7,179.00	9,993.86	9,921.41	137.941	SF
EXIST VERT BIERIG-UPRR #42-35 - Wellbore #1 - Well	6,514.05	6,512.45	6,962.20	6,946.08	431.882	CC, ES
EXIST VERT BIERIG-UPRR #42-35 - Wellbore #1 - Well	10,000.00	7,126.89	9,983.24	9,897.08	115.859	SF
EXIST VERT BRUZEWSKI #33-15F - Wellbore #1 - Des	11,764.82	7,144.00	1,057.02	781.14	3.831	CC

Company:	PDC ENERGY	**Local Co-ordinate Reference:**	Well STEAMBOAT 3N
Project:	WELD COUNTY, COLORADO (TRUE)	**TVD Reference:**	KB 23' @ 4863.00usft (Original Well Elev)
Reference Site:	NW SE SEC. 34 T4N R66W 6th P.M. (STEAMBOAT)	**MD Reference:**	KB 23' @ 4863.00usft (Original Well Elev)
Site Error:	0.00 usft	**North Reference:**	True
Reference Well:	STEAMBOAT 3N	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	ORIGINAL WELLBORE	**Database:**	Database 1
Reference Design:	PROPOSAL #1	**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
NE NW SEC 34 T4N R66W 6th P.M. (CHATFIELD)						
EXIST VERT BRUZEWSKI #33-15F - Wellbore #1 - Des	11,800.00	7,144.00	1,057.61	780.74	3.820	ES
EXIST VERT BRUZEWSKI #33-15F - Wellbore #1 - Des	11,900.00	7,144.00	1,065.63	785.97	3.811	SF
EXIST VERT BRUZEWSKI #33-15F (2) - Wellbore #1 - W	11,974.88	7,153.52	855.53	714.46	6.065	CC
EXIST VERT BRUZEWSKI #33-15F (2) - Wellbore #1 - W	12,000.00	7,153.54	855.90	714.13	6.037	ES
EXIST VERT BRUZEWSKI #33-15F (2) - Wellbore #1 - W	12,100.00	7,153.63	864.63	720.07	5.981	SF
EXIST VERT BRUZEWSKI #33-16F - Wellbore #1 - Wel	10,529.09	7,145.50	894.85	793.89	8.863	CC, ES
EXIST VERT BRUZEWSKI #33-16F - Wellbore #1 - Wel	10,700.00	7,144.04	911.03	805.32	8.619	SF
EXIST VERT FRANK #32-24 - Wellbore #1 - Wellbore #1	15,551.02	7,150.00	3,331.05	3,089.86	13.811	CC, ES, SF
EXIST VERT HEITMAN #K34-5 - Wellbore #1 - Design #	9,352.96	7,141.00	1,605.49	1,396.39	7.678	CC
EXIST VERT HEITMAN #K34-5 - Wellbore #1 - Design #	9,400.00	7,141.00	1,606.18	1,395.80	7.635	ES
EXIST VERT HEITMAN #K34-5 - Wellbore #1 - Design #	9,700.00	7,141.00	1,642.57	1,423.98	7.514	SF
EXIST VERT HSR-BURMESTER #7-34 - Wellbore #1 - D	6,507.25	6,437.80	1,573.99	1,432.69	11.140	CC
EXIST VERT HSR-BURMESTER #7-34 - Wellbore #1 - D	6,550.00	6,480.53	1,574.36	1,431.93	11.054	ES
EXIST VERT HSR-BURMESTER #7-34 - Wellbore #1 - D	6,800.00	6,722.47	1,592.36	1,445.69	10.857	SF
EXIST VERT HSR-CARRICO #3-34 - Wellbore #1 - Desi	8,062.12	7,130.00	3,070.09	2,895.06	17.541	CC
EXIST VERT HSR-CARRICO #3-34 - Wellbore #1 - Desi	8,100.00	7,130.00	3,070.32	2,894.37	17.450	ES
EXIST VERT HSR-CARRICO #3-34 - Wellbore #1 - Desi	9,500.00	7,130.00	3,390.12	3,177.13	15.916	SF
EXIST VERT HSR-COLE #6-34 - Wellbore #1 - Design #	7,914.86	7,159.00	1,624.83	1,454.04	9.514	CC, ES
EXIST VERT HSR-COLE #6-34 - Wellbore #1 - Design #	8,300.00	7,159.00	1,669.85	1,489.60	9.264	SF
EXIST VERT HSR-DIEFENBACH #10-34 - Wellbore #1 -	6,507.25	6,441.80	503.76	362.41	3.564	CC
EXIST VERT HSR-DIEFENBACH #10-34 - Wellbore #1 -	6,550.00	6,484.53	504.31	361.88	3.541	ES
EXIST VERT HSR-DIEFENBACH #10-34 - Wellbore #1 -	6,600.00	6,534.29	506.36	363.02	3.533	SF
EXIST VERT HSR-ENGSTROM #15-34 - Wellbore #1 - W	4,836.21	4,782.57	816.84	804.99	68.943	CC
EXIST VERT HSR-ENGSTROM #15-34 - Wellbore #1 - W	5,000.00	4,943.34	817.12	804.88	66.747	ES
EXIST VERT HSR-ENGSTROM #15-34 - Wellbore #1 - W	15,551.02	7,200.00	8,884.34	8,643.36	36.867	SF
EXIST VERT HSR-FRAHM #9-34 - Wellbore #1 - Design	6,507.25	6,454.80	1,720.07	1,578.40	12.141	CC, ES
EXIST VERT HSR-FRAHM #9-34 - Wellbore #1 - Design	6,550.00	6,497.53	1,721.34	1,579.18	12.108	SF
EXIST VERT HSR-FRENCH #16-34 - Wellbore #1 - Wel	6,507.25	6,476.05	1,403.60	1,387.44	86.826	ES
EXIST VERT HSR-FRENCH #16-34 - Wellbore #1 - Wel	6,516.88	6,486.05	1,403.55	1,387.70	88.525	CC
EXIST VERT HSR-FRENCH #16-34 - Wellbore #1 - Wel	15,551.02	7,271.55	9,813.66	9,573.72	40.902	SF
EXIST VERT HSR-SCHMID #2-34 - Wellbore #1 - Desig	1,200.00	1,126.00	2,957.23	2,933.19	123.002	CC
EXIST VERT HSR-SCHMID #2-34 - Wellbore #1 - Desig	6,650.00	6,564.61	2,963.33	2,817.89	20.375	ES
EXIST VERT HSR-SCHMID #2-34 - Wellbore #1 - Desig	8,100.00	7,139.00	3,310.00	3,133.97	18.803	SF
EXIST VERT HSR-THOMAS #10-35 - Wellbore #1 - Wel	6,511.04	6,500.00	5,727.00	5,710.71	351.638	CC, ES
EXIST VERT HSR-THOMAS #10-35 - Wellbore #1 - Wel	11,100.00	7,100.00	9,908.92	9,793.91	86.152	SF
EXIST VERT HSR-TRAIN #12-35 - Wellbore #1 - Wellbo	5,021.60	5,000.00	3,077.01	3,064.49	245.681	CC
EXIST VERT HSR-TRAIN #12-35 - Wellbore #1 - Wellbo	6,429.01	6,400.00	3,079.22	3,063.44	195.099	ES
EXIST VERT HSR-TRAIN #12-35 - Wellbore #1 - Wellbo	13,100.00	7,047.75	9,270.16	9,145.91	74.605	SF
EXIST VERT JOHNSON #32-35 - Wellbore #1 - Design #	6,507.25	6,448.80	5,982.99	5,841.42	42.260	CC, ES
EXIST VERT JOHNSON #32-35 - Wellbore #1 - Design #	11,000.00	7,165.00	9,951.31	9,697.52	39.211	SF
EXIST VERT MARGHEIM #24-35 - Wellbore #1 - Design	6,507.25	6,465.80	6,381.99	6,240.21	45.016	CC, ES
EXIST VERT MARGHEIM #24-35 - Wellbore #1 - Design	10,500.00	7,182.00	9,941.40	9,701.32	41.409	SF
EXIST VERT SANDAU #24-34 - Wellbore #1 - Wellbore	8,230.43	7,150.00	1,027.40	988.82	26.633	CC, ES
EXIST VERT SANDAU #24-34 - Wellbore #1 - Wellbore	9,000.00	7,150.00	1,283.66	1,224.87	21.836	SF
EXIST VERT SANDAU #34-11F - Wellbore #1 - Wellbore	8,148.41	6,540.14	681.12	656.79	28.003	CC, ES
EXIST VERT SANDAU #34-11F - Wellbore #1 - Wellbore	8,400.00	6,540.14	726.10	698.80	26.595	SF
EXIST VERT SANDAU #34-12F - Wellbore #1 - Wellbore	9,471.85	7,150.00	414.26	342.72	5.790	CC, ES
EXIST VERT SANDAU #34-12F - Wellbore #1 - Wellbore	9,500.00	7,150.00	415.22	342.91	5.742	SF
EXIST VERT SARATOGA #1 - Wellbore #1 - Design #1	14,260.59	7,140.00	677.95	332.32	1.961	CC, ES
EXIST VERT SARATOGA #1 - Wellbore #1 - Design #1	14,300.00	7,140.00	679.10	332.36	1.959	SF
EXIST VERT SHUTT #20-34 - Wellbore #1 - Wellbore #1	6,511.40	6,466.23	855.93	839.56	52.274	CC, ES
EXIST VERT SHUTT #20-34 - Wellbore #1 - Wellbore #1	14,300.00	7,184.06	8,228.94	8,023.57	40.070	SF

Company:	PDC ENERGY	**Local Co-ordinate Reference:**	Well STEAMBOAT 3N
Project:	WELD COUNTY, COLORADO (TRUE)	**TVD Reference:**	KB 23' @ 4863.00usft (Original Well Elev)
Reference Site:	NW SE SEC. 34 T4N R66W 6th P.M. (STEAMBOAT)	**MD Reference:**	KB 23' @ 4863.00usft (Original Well Elev)
Site Error:	0.00 usft	**North Reference:**	True
Reference Well:	STEAMBOAT 3N	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	ORIGINAL WELLBORE	**Database:**	Database 1
Reference Design:	PROPOSAL #1	**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
NE NW SEC 34 T4N R66W 6th P.M. (CHATFIELD)						
EXIST VERT SHUTT #24-34 - Wellbore #1 - Design #1	6,507.25	6,445.80	1,322.46	1,180.98	9.348	CC, ES
EXIST VERT SHUTT #24-34 - Wellbore #1 - Design #1	6,600.00	6,538.29	1,327.20	1,184.41	9.295	SF
EXIST VERT SWEET VALLEY FARMS #31-33 2 - Wellb	12,037.80	7,119.00	3,042.93	2,759.68	10.743	CC
EXIST VERT SWEET VALLEY FARMS #31-33 2 - Wellb	12,100.00	7,119.00	3,043.57	2,758.58	10.680	ES
EXIST VERT SWEET VALLEY FARMS #31-33 2 - Wellb	13,000.00	7,119.00	3,191.43	2,881.30	10.290	SF
EXIST VERT TANNER K #33-11 - Wellbore #1 - Wellbore	13,220.55	7,134.36	532.95	357.07	3.030	CC, ES
EXIST VERT TANNER K #33-11 - Wellbore #1 - Wellbore	13,300.00	7,133.66	538.84	360.74	3.025	SF
EXIST VERT TANNER K #33-14 - Wellbore #1 - Wellbor	13,106.78	7,160.52	1,194.73	1,022.05	6.919	CC, ES
EXIST VERT TANNER K #33-14 - Wellbore #1 - Wellbor	13,300.00	7,160.45	1,210.25	1,032.17	6.796	SF
EXIST VERT UPRC #33-7F - Wellbore #1 - Wellbore #1	11,758.38	7,054.62	1,528.32	1,393.14	11.306	CC
EXIST VERT UPRC #33-7F - Wellbore #1 - Wellbore #1	11,800.00	7,055.52	1,528.89	1,392.55	11.214	ES
EXIST VERT UPRC #33-7F - Wellbore #1 - Wellbore #1	12,200.00	7,064.03	1,590.82	1,443.30	10.783	SF
EXIST VERT UPRC #33-8F - Wellbore #1 - Wellbore #1	10,558.58	7,100.00	1,457.49	1,355.82	14.335	CC
EXIST VERT UPRC #33-8F - Wellbore #1 - Wellbore #1	10,600.00	7,100.00	1,458.08	1,355.26	14.181	ES
EXIST VERT UPRC #33-8F - Wellbore #1 - Wellbore #1	11,100.00	7,100.00	1,554.81	1,438.10	13.322	SF
EXIST VERT UPRC #35-3F - Wellbore #1 - Wellbore #1	6,507.47	6,427.45	5,158.33	5,142.44	324.538	CC, ES
EXIST VERT UPRC #35-3F - Wellbore #1 - Wellbore #1	12,300.00	6,900.00	9,992.01	9,842.28	66.732	SF
EXIST VERT UPRC #35-4F - Wellbore #1 - Wellbore #1	6,537.12	6,567.74	4,175.03	4,159.08	261.729	CC, ES
EXIST VERT UPRC #35-4F - Wellbore #1 - Wellbore #1	13,500.00	7,290.00	9,957.85	9,774.49	54.309	SF
EXIST VERT UPRC #35-5F - Wellbore #1 - Wellbore #1	5,801.92	5,733.04	3,288.18	3,274.01	232.187	CC, ES
EXIST VERT UPRC #35-5F - Wellbore #1 - Wellbore #1	13,800.00	7,250.00	9,912.70	9,721.05	51.724	SF
EXIST VERT UPRC #35-6F - Wellbore #1 - Wellbore #1	6,521.27	6,523.87	4,338.74	4,322.48	266.811	CC, ES
EXIST VERT UPRC #35-6F - Wellbore #1 - Wellbore #1	12,700.00	7,050.68	9,939.92	9,778.88	61.725	SF
EXIST VERT UPRC FEDERAL #33-3F - Wellbore #1 - W	12,990.71	7,076.31	2,909.80	2,740.10	17.147	CC
EXIST VERT UPRC FEDERAL #33-3F - Wellbore #1 - W	13,100.00	7,075.42	2,911.85	2,739.10	16.856	ES
EXIST VERT UPRC FEDERAL #33-3F - Wellbore #1 - W	14,400.00	7,064.89	3,233.09	3,023.96	15.459	SF
EXIST VERT UPRC FEDERAL #33-4F - Wellbore #1 - D	14,419.97	7,121.00	2,747.79	2,397.89	7.853	CC
EXIST VERT UPRC FEDERAL #33-4F - Wellbore #1 - D	14,500.00	7,121.00	2,748.96	2,396.81	7.806	ES
EXIST VERT UPRC FEDERAL #33-4F - Wellbore #1 - D	15,000.00	7,121.00	2,808.35	2,442.18	7.670	SF
EXIST VERT UPRC FEDERAL #33-5K - Wellbore #1 - W	14,816.88	7,135.62	1,927.54	1,706.61	8.725	CC
EXIST VERT UPRC FEDERAL #33-5K - Wellbore #1 - W	14,900.00	7,135.45	1,929.33	1,706.07	8.642	ES
EXIST VERT UPRC FEDERAL #33-5K - Wellbore #1 - W	15,300.00	7,134.59	1,987.17	1,752.69	8.475	SF
EXIST VERT UPRC FEDERAL #33-6F - Wellbore #1 - W	13,305.68	7,105.19	1,795.36	1,617.12	10.073	CC
EXIST VERT UPRC FEDERAL #33-6F - Wellbore #1 - W	13,400.00	7,100.00	1,797.83	1,616.95	9.939	ES
EXIST VERT UPRC FEDERAL #33-6F - Wellbore #1 - W	13,800.00	7,078.14	1,861.97	1,669.92	9.695	SF
EXIST VERT UPRC K #35-19 - Wellbore #1 - Wellbore #	6,518.16	6,492.85	4,359.23	4,343.36	274.830	CC, ES
EXIST VERT UPRC K #35-19 - Wellbore #1 - Wellbore #	12,900.00	6,700.00	9,969.51	9,805.06	60.625	SF
EXIST VERT WEBER K #33-10 - Wellbore #1 - Design #	11,922.52	7,140.00	173.01	-107.23	0.617	Level 1, CC, ES, SF
EXIST VERT WEBER K #33-9 - Wellbore #1 - Design #1	10,777.85	7,148.00	153.70	-94.75	0.619	Level 1, CC, ES, SF
EXIST VERT WILLIAMS #41-34-1 - Wellbore #1 - Design	6,507.25	6,422.80	3,416.29	3,274.11	24.029	CC
EXIST VERT WILLIAMS #41-34-1 - Wellbore #1 - Design	6,550.00	6,465.53	3,416.90	3,273.67	23.856	ES
EXIST VERT WILLIAMS #41-34-1 - Wellbore #1 - Design	7,600.00	7,138.27	3,791.30	3,626.63	23.023	SF
EXIST VERT WILLIAMS #42-34 - Wellbore #1 - Design #	6,507.25	6,436.80	2,528.16	2,386.81	17.885	CC, ES
EXIST VERT WILLIAMS #42-34 - Wellbore #1 - Design #	6,600.00	6,529.29	2,532.39	2,389.51	17.724	SF

Company:	PDC ENERGY	**Local Co-ordinate Reference:**	Well STEAMBOAT 3N
Project:	WELD COUNTY, COLORADO (TRUE)	**TVD Reference:**	KB 23' @ 4863.00usft (Original Well Elev)
Reference Site:	NW SE SEC. 34 T4N R66W 6th P.M. (STEAMBOAT)	**MD Reference:**	KB 23' @ 4863.00usft (Original Well Elev)
Site Error:	0.00 usft	**North Reference:**	True
Reference Well:	STEAMBOAT 3N	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	ORIGINAL WELLBORE	**Database:**	Database 1
Reference Design:	PROPOSAL #1	**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
NE NW SEC. 2 T3N R66W 6th P.M. (EL DORADO)						
EL DORADO 1N - ORIGINAL WELLBORE - PROPOSAL	6,361.80	6,657.94	2,791.32	2,740.25	54.658	CC
EL DORADO 1N - ORIGINAL WELLBORE - PROPOSAL	6,400.00	6,683.40	2,791.35	2,740.18	54.546	ES
EL DORADO 1N - ORIGINAL WELLBORE - PROPOSAL	14,300.00	6,977.84	9,982.27	9,762.24	45.368	SF
EL DORADO 2N - ORIGINAL WELLBORE - PROPOSAL	6,462.31	6,673.48	3,104.47	3,059.04	68.328	CC
EL DORADO 2N - ORIGINAL WELLBORE - PROPOSAL	6,500.00	6,700.00	3,104.49	3,058.95	68.164	ES
EL DORADO 2N - ORIGINAL WELLBORE - PROPOSAL	13,900.00	6,950.00	9,922.92	9,715.91	47.933	SF
EL DORADO 3N - ORIGINAL WELLBORE - PROPOSAL	6,361.80	6,515.86	3,419.09	3,379.34	86.009	CC
EL DORADO 3N - ORIGINAL WELLBORE - PROPOSAL	6,400.00	6,546.00	3,419.11	3,379.24	85.751	ES
EL DORADO 3N - ORIGINAL WELLBORE - PROPOSAL	13,600.00	6,850.00	9,967.88	9,775.41	51.790	SF
EL DORADO 4N - ORIGINAL WELLBORE - PROPOSAL	6,461.80	6,578.69	3,728.67	3,693.15	104.990	CC
EL DORADO 4N - ORIGINAL WELLBORE - PROPOSAL	6,500.00	6,604.14	3,728.69	3,693.05	104.632	ES
EL DORADO 4N - ORIGINAL WELLBORE - PROPOSAL	13,300.00	6,850.00	9,992.54	9,809.96	54.731	SF
EL DORADO 5N - ORIGINAL WELLBORE - PROPOSAL	6,361.80	6,466.71	3,993.79	3,961.85	125.025	CC
EL DORADO 5N - ORIGINAL WELLBORE - PROPOSAL	6,400.00	6,496.85	3,993.80	3,961.72	124.499	ES
EL DORADO 5N - ORIGINAL WELLBORE - PROPOSAL	13,000.00	6,800.00	9,977.95	9,806.99	58.362	SF
EL DORADO 6N - ORIGINAL WELLBORE - PROPOSAL	6,461.80	6,562.04	4,322.94	4,292.98	144.309	CC
EL DORADO 6N - ORIGINAL WELLBORE - PROPOSAL	6,550.00	6,600.00	4,324.48	4,289.38	123.201	ES
EL DORADO 6N - ORIGINAL WELLBORE - PROPOSAL	12,600.00	6,850.00	9,918.21	9,756.27	61.249	SF
EL DORADO 7N - ORIGINAL WELLBORE - PROPOSAL	3,790.16	3,870.83	4,570.58	4,552.56	253.695	CC
EL DORADO 7N - ORIGINAL WELLBORE - PROPOSAL	6,550.00	6,550.00	4,580.74	4,544.82	127.512	ES
EL DORADO 7N - ORIGINAL WELLBORE - PROPOSAL	12,400.00	6,800.00	9,988.07	9,832.63	64.253	SF
EL DORADO 8N - ORIGINAL WELLBORE - PROPOSAL	2,336.53	2,157.23	4,702.03	4,689.57	377.271	CC, ES
EL DORADO 8N - ORIGINAL WELLBORE - PROPOSAL	12,000.00	6,870.27	9,933.27	9,783.28	66.226	SF
NW NE SEC. 3 T3N R66W 6th P.M. (TRIPPETT)						
TRIPPETT 1N - ORIGINAL WELLBORE - PROPOSAL #	6,461.79	6,531.76	1,259.49	1,222.21	33.792	CC
TRIPPETT 1N - ORIGINAL WELLBORE - PROPOSAL #	6,500.00	6,557.21	1,259.55	1,222.16	33.687	ES
TRIPPETT 1N - ORIGINAL WELLBORE - PROPOSAL #	6,507.25	6,557.21	1,259.64	1,222.24	33.675	SF
TRIPPETT 2N - ORIGINAL WELLBORE - PROPOSAL #	6,365.72	6,444.10	1,262.98	1,226.43	34.560	CC
TRIPPETT 2N - ORIGINAL WELLBORE - PROPOSAL #	6,400.00	6,475.63	1,262.98	1,226.32	34.450	ES
TRIPPETT 2N - ORIGINAL WELLBORE - PROPOSAL #	6,507.25	6,500.00	1,266.29	1,229.36	34.293	SF
TRIPPETT 3N - ORIGINAL WELLBORE - PROPOSAL #	6,461.79	6,565.81	1,352.30	1,317.98	39.398	CC
TRIPPETT 3N - ORIGINAL WELLBORE - PROPOSAL #	6,550.00	6,600.00	1,353.91	1,316.27	35.967	ES, SF
TRIPPETT 4N - ORIGINAL WELLBORE - PROPOSAL #	6,365.72	6,511.29	1,486.19	1,454.53	46.956	CC
TRIPPETT 4N - ORIGINAL WELLBORE - PROPOSAL #	6,550.00	6,600.00	1,491.86	1,449.31	35.066	ES, SF
TRIPPETT 5N - ORIGINAL WELLBORE - PROPOSAL #	6,163.89	6,358.78	1,663.66	1,633.20	54.626	CC
TRIPPETT 5N - ORIGINAL WELLBORE - PROPOSAL #	6,550.00	6,700.00	1,665.29	1,618.41	35.521	ES, SF
TRIPPETT 6N - ORIGINAL WELLBORE - PROPOSAL #	4,671.68	4,873.37	1,820.67	1,796.80	76.250	CC
TRIPPETT 6N - ORIGINAL WELLBORE - PROPOSAL #	4,800.00	4,993.51	1,821.23	1,796.67	74.136	ES
TRIPPETT 6N - ORIGINAL WELLBORE - PROPOSAL #	6,550.00	6,718.74	1,872.26	1,822.01	37.260	SF
TRIPPETT 7N - ORIGINAL WELLBORE - PROPOSAL #	3,594.75	3,785.86	1,964.71	1,946.10	105.572	CC
TRIPPETT 7N - ORIGINAL WELLBORE - PROPOSAL #	3,700.00	3,881.98	1,965.18	1,946.00	102.457	ES
TRIPPETT 7N - ORIGINAL WELLBORE - PROPOSAL #	6,550.00	6,900.00	2,194.53	2,140.33	40.489	SF
TRIPPETT 8N - ORIGINAL WELLBORE - PROPOSAL #	2,965.46	3,151.06	2,035.74	2,020.20	131.028	CC
TRIPPETT 8N - ORIGINAL WELLBORE - PROPOSAL #	3,000.00	3,181.69	2,035.80	2,020.08	129.485	ES
TRIPPETT 8N - ORIGINAL WELLBORE - PROPOSAL #	12,400.00	7,180.98	7,726.93	7,544.80	42.427	SF
TRIPPETT 9N - ORIGINAL WELLBORE - PROPOSAL #	7,137.01	7,264.24	1,889.58	1,855.56	55.542	CC
TRIPPETT 9N - ORIGINAL WELLBORE - PROPOSAL #	15,551.02	15,649.31	1,892.11	1,411.82	3.940	ES, SF

Company:	PDC ENERGY	**Local Co-ordinate Reference:**	Well STEAMBOAT 3N
Project:	WELD COUNTY, COLORADO (TRUE)	**TVD Reference:**	KB 23' @ 4863.00usft (Original Well Elev)
Reference Site:	NW SE SEC. 34 T4N R66W 6th P.M. (STEAMBOAT)	**MD Reference:**	KB 23' @ 4863.00usft (Original Well Elev)
Site Error:	0.00 usft	**North Reference:**	True
Reference Well:	STEAMBOAT 3N	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	ORIGINAL WELLBORE	**Database:**	Database 1
Reference Design:	PROPOSAL #1	**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
NW SE SEC. 34 T4N R66W 6th P.M. (STEAMBOAT)						
ABDN VERT HSR-BOB 16-35 - Wellbore #1 - Wellbore #	6,387.37	6,355.28	6,656.92	6,641.06	419.939	CC
ABDN VERT HSR-BOB 16-35 - Wellbore #1 - Wellbore #	6,400.00	6,362.26	6,656.92	6,641.04	419.203	ES
ABDN VERT HSR-BOB 16-35 - Wellbore #1 - Wellbore #	10,200.00	7,200.00	9,930.04	9,838.29	108.226	SF
EXIST HZ LORENZ 23-35 - Wellbore #1 - Wellbore #1	6,511.59	6,500.29	4,847.36	4,830.96	295.636	CC, ES
EXIST HZ LORENZ 23-35 - Wellbore #1 - Wellbore #1	12,000.00	7,224.38	9,922.31	9,781.45	70.442	SF
EXIST VERT CLIFFORD L3-29 - Wellbore #1 - Wellbore	8,687.63	7,189.45	1,905.94	1,855.44	37.742	CC
EXIST VERT CLIFFORD L3-29 - Wellbore #1 - Wellbore	8,700.00	7,189.33	1,905.98	1,855.16	37.500	ES
EXIST VERT CLIFFORD L3-29 - Wellbore #1 - Wellbore	10,700.00	7,172.89	2,771.63	2,666.10	26.262	SF
EXIST VERT HSR-BIG GEORGE #14-35 - Wellbore #1 -	6,507.25	6,483.80	3,992.39	3,848.41	27.728	CC, ES
EXIST VERT HSR-BIG GEORGE #14-35 - Wellbore #1 -	6,600.00	6,576.29	3,998.30	3,853.68	27.646	SF
STEAMBOAT 10N - ORIGINAL WELLBORE - PROPOSA	441.94	441.94	104.99	103.29	61.567	CC
STEAMBOAT 10N - ORIGINAL WELLBORE - PROPOSA	600.00	599.70	105.20	102.81	43.882	ES
STEAMBOAT 10N - ORIGINAL WELLBORE - PROPOSA	7,200.00	7,316.48	437.01	401.56	12.328	SF
STEAMBOAT 11N - ORIGINAL WELLBORE - PROPOSA	545.58	545.59	119.96	117.79	55.269	CC
STEAMBOAT 11N - ORIGINAL WELLBORE - PROPOSA	700.00	699.70	120.15	117.30	42.255	ES
STEAMBOAT 11N - ORIGINAL WELLBORE - PROPOSA	7,258.33	7,323.52	161.03	125.33	4.510	SF
STEAMBOAT 12N - ORIGINAL WELLBORE - PROPOSA	700.00	700.00	134.97	132.10	47.025	CC
STEAMBOAT 12N - ORIGINAL WELLBORE - PROPOSA	800.00	799.17	135.28	131.98	40.960	ES
STEAMBOAT 12N - ORIGINAL WELLBORE - PROPOSA	7,169.63	7,317.79	214.11	178.76	6.057	SF
STEAMBOAT 13N - ORIGINAL WELLBORE - PROPOSA	600.00	600.00	149.95	147.53	61.943	CC, ES
STEAMBOAT 13N - ORIGINAL WELLBORE - PROPOSA	7,350.00	7,284.96	528.90	492.69	14.606	SF
STEAMBOAT 14N - ORIGINAL WELLBORE - PROPOSA	500.00	500.00	164.96	162.99	83.684	CC, ES
STEAMBOAT 14N - ORIGINAL WELLBORE - PROPOSA	7,900.00	7,000.00	990.25	946.03	22.395	SF
STEAMBOAT 15N - ORIGINAL WELLBORE - PROPOSA	400.00	400.00	179.97	178.44	118.269	CC, ES
STEAMBOAT 15N - ORIGINAL WELLBORE - PROPOSA	8,400.00	6,950.00	1,456.70	1,398.73	25.127	SF
STEAMBOAT 16N - ORIGINAL WELLBORE - PROPOSA	300.00	300.00	194.94	193.87	181.824	CC, ES
STEAMBOAT 16N - ORIGINAL WELLBORE - PROPOSA	9,200.00	6,850.00	2,241.37	2,162.77	28.518	SF
STEAMBOAT 1N - ORIGINAL WELLBORE - PROPOSA	300.00	300.00	29.99	28.92	27.973	CC, ES
STEAMBOAT 1N - ORIGINAL WELLBORE - PROPOSA	14,900.00	14,901.13	630.89	190.12	1.431	Level 3, SF
STEAMBOAT 2N - ORIGINAL WELLBORE - PROPOSA	400.00	400.00	15.01	13.49	9.864	CC
STEAMBOAT 2N - ORIGINAL WELLBORE - PROPOSA	15,241.13	15,164.43	333.42	-110.20	0.752	Level 1, ES, SF
STEAMBOAT 4N - ORIGINAL WELLBORE - PROPOSA	1,100.00	1,100.00	15.01	10.34	3.215	CC
STEAMBOAT 4N - ORIGINAL WELLBORE - PROPOSA	15,551.02	15,475.66	305.03	-151.33	0.668	Level 1, ES, SF
STEAMBOAT 5N - ORIGINAL WELLBORE - PROPOSA	1,000.00	1,000.00	29.98	25.76	7.107	CC, ES
STEAMBOAT 5N - ORIGINAL WELLBORE - PROPOSA	15,551.02	15,601.85	619.77	141.29	1.295	Level 3, SF
STEAMBOAT 6N - ORIGINAL WELLBORE - PROPOSA	900.00	900.00	44.99	41.22	11.936	CC, ES
STEAMBOAT 6N - ORIGINAL WELLBORE - PROPOSA	15,551.02	15,536.56	924.63	448.44	1.942	SF
STEAMBOAT 7N - ORIGINAL WELLBORE - PROPOSA	800.00	800.00	60.00	56.68	18.074	CC, ES
STEAMBOAT 7N - ORIGINAL WELLBORE - PROPOSA	15,551.02	15,686.17	1,249.69	771.15	2.611	SF
STEAMBOAT 8N - ORIGINAL WELLBORE - PROPOSA	700.00	700.00	74.97	72.10	26.121	CC, ES
STEAMBOAT 8N - ORIGINAL WELLBORE - PROPOSA	15,551.02	15,672.50	1,542.55	1,064.57	3.227	SF
STEAMBOAT 9N - ORIGINAL WELLBORE - PROPOSA	339.98	339.98	89.98	88.74	72.123	CC
STEAMBOAT 9N - ORIGINAL WELLBORE - PROPOSA	500.00	499.70	90.23	88.28	46.199	ES
STEAMBOAT 9N - ORIGINAL WELLBORE - PROPOSA	7,700.00	7,131.20	788.63	747.03	18.955	SF

Company:	PDC ENERGY	**Local Co-ordinate Reference:**	Well STEAMBOAT 3N
Project:	WELD COUNTY, COLORADO (TRUE)	**TVD Reference:**	KB 23' @ 4863.00usft (Original Well Elev)
Reference Site:	NW SE SEC. 34 T4N R66W 6th P.M. (STEAMBOAT)	**MD Reference:**	KB 23' @ 4863.00usft (Original Well Elev)
Site Error:	0.00 usft	**North Reference:**	True
Reference Well:	STEAMBOAT 3N	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	ORIGINAL WELLBORE	**Database:**	Database 1
Reference Design:	PROPOSAL #1	**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.32 T4N R66W 6th P.M. (TARIN FEDERAL)						
EXIST VERT FLOYD #1 - Wellbore #1 - Wellbore #1	15,551.02	7,122.59	634.37	393.23	2.631	CC, ES, SF
EXIST VERT FLOYD #5 - Wellbore #1 - Wellbore #1	15,551.02	7,150.67	1,035.20	794.09	4.293	CC, ES, SF
EXIST VERT GLEN #44-32 - Wellbore #1 - Wellbore #1	15,551.02	7,139.41	935.98	694.60	3.878	CC, ES, SF
TARIN FEDERAL 32W-234 - JOB #2015-138-135 - FINA	15,551.02	7,185.00	706.15	460.34	2.873	CC, ES, SF
TARIN FEDERAL 32W-434 - JOB #2015-139-135 - FINA	15,551.02	7,265.70	276.14	22.11	1.087	Level 2, CC, ES, SF
TARIN FEDERAL 32X-204 - JOB #2015-141-135 - FINAL	15,551.02	7,065.54	502.07	278.51	2.246	CC, ES, SF
TARIN FEDERAL 32X-314 - JOB #2015-140-135 - FINAL	15,551.02	7,163.47	199.92	117.64	2.430	CC, ES, SF
TARIN FEDERAL 32X-334 - JOB #2015-142-135 - FINAL	15,551.02	7,126.55	644.89	394.20	2.572	CC, ES, SF
TARIN FEDERAL 32Y-214 - JOB #2015-143-135 - FINAL	15,551.02	7,099.00	1,238.20	985.94	4.908	CC, ES, SF
TARIN FEDERAL 32Y-314 - JOB#2015-144-135 - FINAL	15,551.02	7,154.76	1,488.27	1,234.13	5.856	CC, ES, SF
TARIN FEDERAL 32Y-404 - JOB# 2015-145-135 - FINAL	15,551.02	7,225.94	1,647.90	1,392.59	6.454	CC, ES, SF
SW NE SEC. 5 T3N R66W 6th P.M. (NAVAJO)						
EXIST DD BRIGHT L #3-30D - Wellbore #1 - Wellbore #1	10,052.49	7,283.07	1,753.47	1,649.75	16.905	CC
EXIST DD BRIGHT L #3-30D - Wellbore #1 - Wellbore #1	10,100.00	7,282.79	1,754.12	1,649.08	16.700	ES
EXIST DD BRIGHT L #3-30D - Wellbore #1 - Wellbore #1	10,900.00	7,278.39	1,947.54	1,820.35	15.312	SF
EXIST DD WEBBER #29-4 - Wellbore #1 - Wellbore #1	13,940.98	7,298.58	1,758.32	1,542.12	8.133	CC
EXIST DD WEBBER #29-4 - Wellbore #1 - Wellbore #1	14,000.00	7,298.80	1,759.31	1,541.46	8.076	ES
EXIST DD WEBBER #29-4 - Wellbore #1 - Wellbore #1	14,300.00	7,299.94	1,794.59	1,568.34	7.932	SF

Offset Design NE NE SEC 2 T3N R66W 6th P.M. (CHEYENNE) - CHEYENNE 1N - ORIGINAL WELLBORE - PROPO

Offset Site Error: 0.00 usft

Survey Program: 0-MWD

Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
0.00	0.00	2,063.97	2,007.99	0.00	9.06	107.22	-1,918.79	6,190.50	6,780.57				
100.00	100.00	2,159.19	2,098.67	0.09	9.66	107.15	-1,902.68	6,166.31	6,751.18	6,742.02	9.16	736.736	
200.00	200.00	2,254.42	2,189.35	0.31	10.27	107.07	-1,886.56	6,142.11	6,721.80	6,711.86	9.95	675.813	
300.00	300.00	2,349.65	2,280.03	0.54	10.88	107.00	-1,870.45	6,117.91	6,692.44	6,681.71	10.73	623.763	
400.00	400.00	2,444.87	2,370.71	0.76	11.49	106.93	-1,854.33	6,093.71	6,663.08	6,651.57	11.51	578.786	
500.00	500.00	2,540.10	2,461.39	0.99	12.09	106.85	-1,838.22	6,069.51	6,633.73	6,621.44	12.30	539.539	
600.00	600.00	2,635.32	2,552.06	1.21	12.70	106.77	-1,822.11	6,045.31	6,604.40	6,591.32	13.08	504.994	
700.00	700.00	2,730.55	2,642.74	1.44	13.31	106.70	-1,805.99	6,021.11	6,575.07	6,561.21	13.86	474.359	
800.00	800.00	2,825.77	2,733.42	1.66	13.92	106.62	-1,789.88	5,996.91	6,545.76	6,531.12	14.64	447.006	
900.00	900.00	2,921.00	2,824.10	1.88	14.53	106.54	-1,773.76	5,972.72	6,516.46	6,501.03	15.43	422.437	
1,000.00	1,000.00	3,016.22	2,914.78	2.11	15.14	106.46	-1,757.65	5,948.52	6,487.17	6,470.96	16.21	400.249	
1,100.00	1,100.00	3,111.45	3,005.46	2.33	15.75	106.38	-1,741.54	5,924.32	6,457.89	6,440.90	16.99	380.112	
1,200.00	1,200.00	3,206.67	3,096.14	2.56	16.36	106.30	-1,725.42	5,900.12	6,428.62	6,410.85	17.77	361.755	
1,300.00	1,299.98	3,301.39	3,186.34	2.77	16.97	7.01	-1,709.39	5,876.05	6,397.71	6,385.32	12.39	516.359	
1,400.00	1,399.84	3,395.03	3,275.50	2.97	17.57	7.02	-1,693.55	5,852.25	6,363.54	6,350.73	12.81	496.664	
1,500.00	1,499.45	3,487.46	3,363.52	3.18	18.17	7.05	-1,677.91	5,828.77	6,326.15	6,312.93	13.21	478.769	
1,600.00	1,598.70	3,578.58	3,450.29	3.42	18.75	7.09	-1,662.49	5,805.61	6,285.57	6,271.98	13.59	462.476	
1,700.00	1,697.47	3,668.28	3,535.71	3.68	19.33	7.14	-1,647.31	5,782.82	6,241.86	6,227.91	13.95	447.600	
1,800.00	1,795.62	3,756.45	3,619.66	3.98	19.89	7.21	-1,632.39	5,760.41	6,195.06	6,180.79	14.28	433.974	
1,877.53	1,871.46	3,824.18	3,684.16	4.24	20.33	7.16	-1,620.93	5,743.20	6,157.60	6,142.94	14.67	419.808	
1,900.00	1,893.46	3,843.85	3,702.89	4.31	20.45	7.12	-1,617.60	5,738.20	6,146.82	6,132.00	14.82	414.676	
2,000.00	1,991.76	3,932.37	3,787.18	4.59	21.02	6.93	-1,602.62	5,715.71	6,100.73	6,085.22	15.51	393.380	
2,100.00	2,090.64	4,022.40	3,872.91	4.87	21.60	6.74	-1,587.38	5,692.83	6,057.75	6,041.56	16.19	374.159	
2,200.00	2,189.99	4,113.82	3,959.97	5.13	22.19	6.57	-1,571.91	5,669.59	6,017.93	6,001.06	16.86	356.839	

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