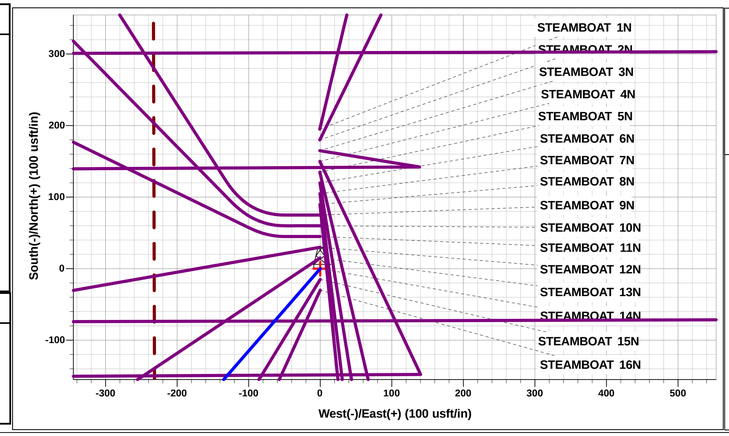
Project: WELD COUNTY, COLORADO (TRUE)
Site: NW SE SEC. 34 T4N R66W 6th P.M. (STEAMBOAT)
Well: STEAMBOAT 14N
Wellbore: ORIGINAL WELLBORE
Design: PROPOSAL #1

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: 1528ft FSL & 2432ft FEL of Sec 34
500.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00	START NUDGE (2°/100ft BUR)
1095.62	1100.00	12.00	221.00	-47.24	-41.07	-36.91	62.60	EOB TO 12° INC
4811.82	4899.22	12.00	221.00	-643.36	-559.34	-502.63	852.50	END OF TANGENT
5407.44	5499.22	0.00	0.00	-690.60	-600.41	-539.54	915.11	EOD TO VERTICAL
6396.81	6488.59	0.00	0.00	-690.60	-600.41	-539.54	915.11	KOP (8°/100ft BUR)
7088.60	7426.09	75.00	89.84	-689.12	-69.58	-10.76	1445.94	EP *NEW*: 839ft FSL & 2500ft FEL of Sec 34
7113.00	7616.45	90.23	89.84	-688.60	118.65	176.75	1634.17	HZ LANDING POINT
7108.01	8859.45	90.23	89.84	-685.13	1361.64	1414.94	2877.16	END OF TANGENT
7107.27	9042.46	90.23	84.35	-675.86	1544.34	1596.19	3060.17	EOT TO 84.35° AZ
7107.15	9072.46	90.23	84.35	-672.91	1574.19	1625.69	3090.17	END OF TANGENT
7106.42	9255.46	90.23	89.84	-663.63	1756.89	1806.94	3273.17	EOT TO 89.84° AZ
7083.00	15088.01	90.23	89.84	-647.36	7589.37	7616.93	9105.67	BHL: 860ft FSL & 150ft FEL of Sec 35

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude
KOP - STEAMBOAT 14N	6396.81	-690.60	-600.41	40.263322°N	104.764707°W
EP *NEW* - STEAMBOAT 14N	7088.60	-689.12	-69.58	40.263327°N	104.762805°W
BHL - STEAMBOAT 14N	7083.00	-647.36	7589.37	40.263438°N	104.735361°W
SHL - STEAMBOAT 14N	0.00	0.00	0.00	40.265218°N	104.762555°W

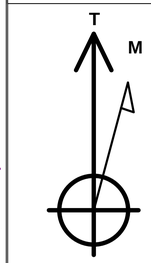


PROPOSED LOCAL COORDINATES:

SHL: 1528ft FSL & 2432ft FEL of Sec 34

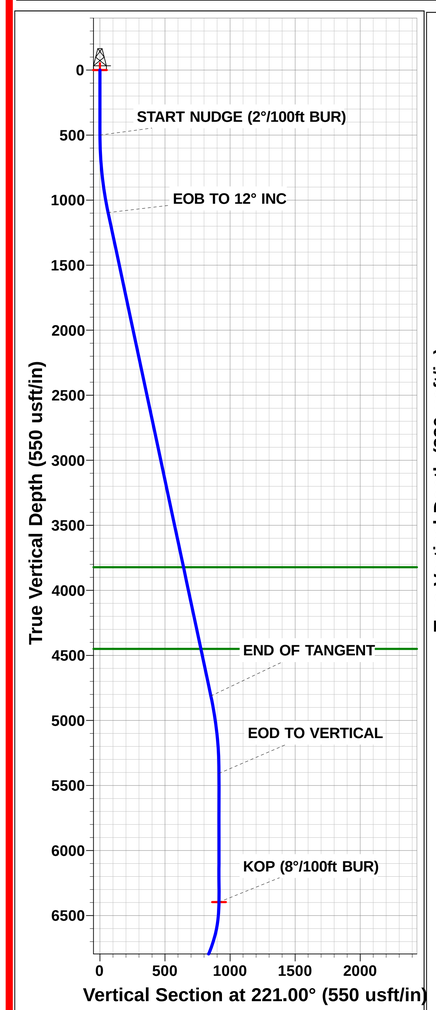
EP *NEW*: 839ft FSL & 2500ft FEL of Sec 34

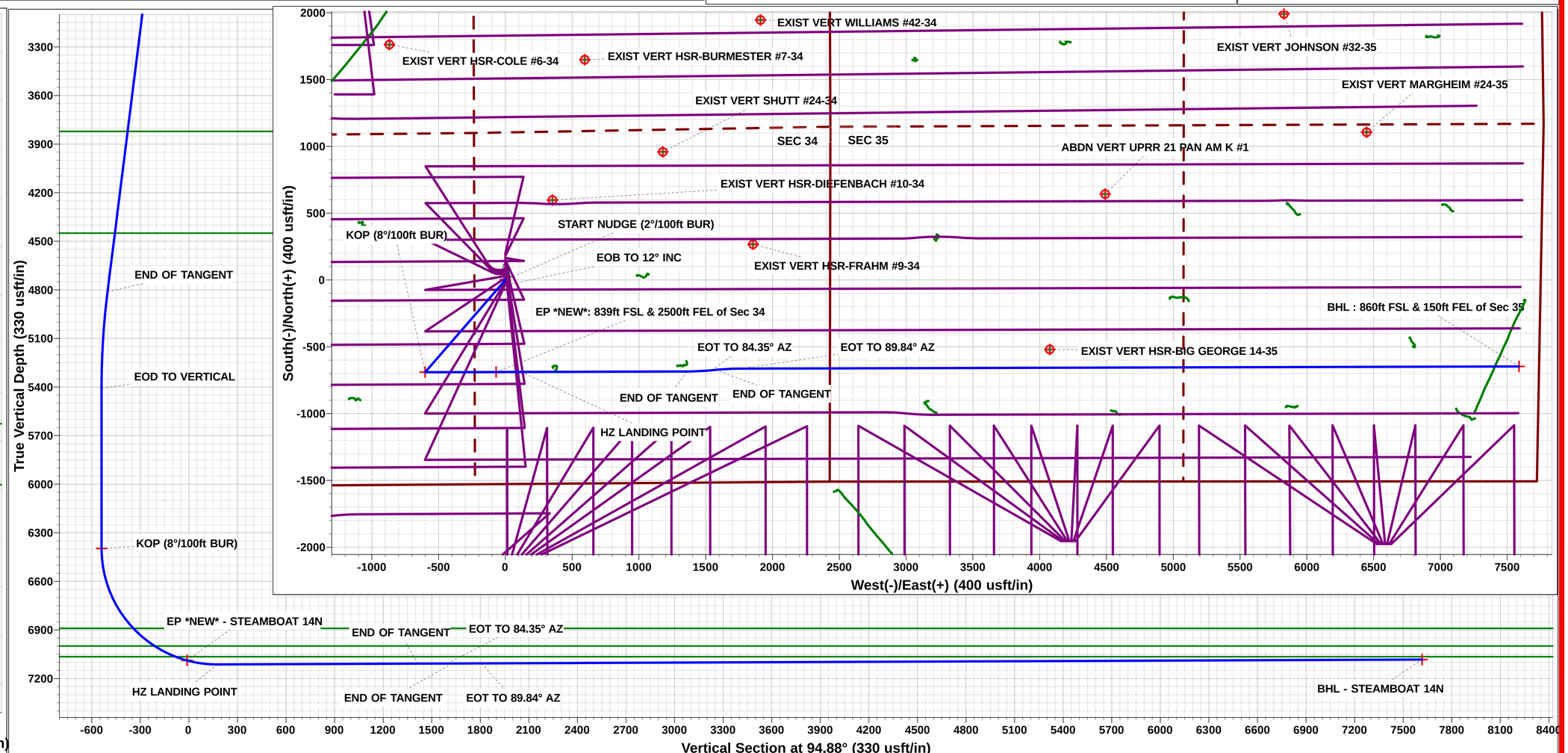
BHL: 860ft FSL & 150ft FEL of Sec 35



Azimuths to True North
Magnetic North: 8.03°

Magnetic Field
Strength: 52139.4snT
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 14N

ORIGINAL WELLBORE
PROPOSAL #1

Anticollision Report

25 January, 2019

Company:	PDC ENERGY	**Local Co-ordinate Reference:**	Well STEAMBOAT 14N
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 14N	**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	15,087.68	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	12,691.75	7,026.06	640.18	479.87	3.994	CC
CHEYENNE 1N - ORIGINAL WELLBORE - PROPOSAL	12,700.00	7,026.04	640.23	479.73	3.989	ES
CHEYENNE 1N - ORIGINAL WELLBORE - PROPOSAL	12,800.00	7,025.85	649.27	486.40	3.986	SF
CHEYENNE 2N - ORIGINAL WELLBORE - PROPOSAL	13,036.51	7,000.00	592.01	423.09	3.505	CC, ES
CHEYENNE 2N - ORIGINAL WELLBORE - PROPOSAL	13,100.00	7,000.00	595.41	424.91	3.492	SF
CHEYENNE 3N - ORIGINAL WELLBORE - PROPOSAL	13,368.98	6,900.00	640.28	472.94	3.826	CC, ES
CHEYENNE 3N - ORIGINAL WELLBORE - PROPOSAL	13,400.00	6,900.00	641.04	472.95	3.814	SF
CHEYENNE 4N - ORIGINAL WELLBORE - PROPOSAL	13,691.20	6,950.00	584.07	403.23	3.230	CC
CHEYENNE 4N - ORIGINAL WELLBORE - PROPOSAL	13,700.00	6,950.00	584.14	403.08	3.226	ES, SF
CHEYENNE 5N - ORIGINAL WELLBORE - PROPOSAL	14,001.27	6,876.46	639.31	459.77	3.561	CC, ES
CHEYENNE 5N - ORIGINAL WELLBORE - PROPOSAL	14,100.00	6,876.26	646.89	465.01	3.557	SF
CHEYENNE 6N - ORIGINAL WELLBORE - PROPOSAL	14,311.23	6,928.54	592.12	398.42	3.057	CC, ES
CHEYENNE 6N - ORIGINAL WELLBORE - PROPOSAL	14,400.00	6,928.35	598.74	402.85	3.057	SF
CHEYENNE 7N - ORIGINAL WELLBORE - PROPOSAL	14,671.06	6,900.00	639.46	439.32	3.195	CC
CHEYENNE 7N - ORIGINAL WELLBORE - PROPOSAL	14,700.00	6,900.00	640.11	439.27	3.187	ES, SF
CHEYENNE 8N - ORIGINAL WELLBORE - PROPOSAL	15,050.84	6,981.11	591.93	373.44	2.709	CC, ES
CHEYENNE 8N - ORIGINAL WELLBORE - PROPOSAL	15,088.01	6,981.03	593.09	374.03	2.707	SF
EXIST DD LORENZ #39-35 - Wellbore #1 - Wellbore #1	15,088.01	7,185.06	497.39	258.29	2.080	CC, ES, SF
EXIST DD MILE HIGH #30-2 - Wellbore #1 - Wellbore #1	9,970.57	7,157.26	917.82	821.05	9.485	CC
EXIST DD MILE HIGH #30-2 - Wellbore #1 - Wellbore #1	10,000.00	7,156.13	918.29	820.72	9.412	ES
EXIST DD MILE HIGH #30-2 - Wellbore #1 - Wellbore #1	10,200.00	7,148.27	946.01	843.00	9.183	SF
EXIST VERT HSR-BACANSKAS #13-35 - Wellbore #1 -	10,651.64	7,100.00	251.94	150.94	2.495	CC, ES, SF
EXIST VERT HSR-BANCROFT #15-35 - Wellbore #1 - W	13,347.34	7,075.37	296.69	120.84	1.687	CC, ES, SF
EXIST VERT LORENZ #14-35 - Wellbore #1 - Wellbore #	12,030.92	7,086.33	320.70	181.58	2.305	CC, ES, SF
EXIST VERT LORENZ #16-35 - Wellbore #1 - Wellbore #	14,617.20	7,088.43	319.63	108.13	1.511	CC, ES, 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 14N
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 14N	**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	529.57	486.26	3,017.37	3,015.61	1,715.388	CC, ES
ABDN DD PIERSON #21-34 - Wellbore #1 - Wellbore #1	15,000.00	7,077.52	8,442.42	8,206.90	35.846	SF
ABDN DD PIERSON #27-34 - Wellbore #1 - Wellbore #1	527.61	483.84	3,015.08	3,013.23	1,633.890	CC, ES
ABDN DD PIERSON #27-34 - Wellbore #1 - Wellbore #1	15,000.00	7,251.79	7,695.50	7,447.12	30.983	SF
ABDN DD PIERSON #28-34 - Wellbore #1 - Wellbore #1	178.45	99.40	3,018.91	3,018.63	10,000.000	CC
ABDN DD PIERSON #28-34 - Wellbore #1 - Wellbore #1	500.00	411.35	3,019.48	3,018.28	2,508.373	ES
ABDN DD PIERSON #28-34 - Wellbore #1 - Wellbore #1	15,000.00	7,061.24	8,836.18	8,613.62	39.701	SF
ABDN VERT AGRI PROD INC FED #32-7F - Wellbore #	5,855.99	5,671.65	9,998.44	9,981.16	578.371	CC
ABDN VERT AGRI PROD INC FED #32-7F - Wellbore #	5,900.00	5,700.00	9,998.49	9,981.14	576.169	ES
ABDN VERT AGRI PROD INC FED #32-7F - Wellbore #	6,100.00	5,852.04	9,999.15	9,981.48	566.080	SF
ABDN VERT AGRI PROD INC FED #32-8F - Wellbore #	6,496.85	6,400.00	8,628.90	8,605.94	375.767	CC, ES
ABDN VERT AGRI PROD INC FED #32-8F - Wellbore #	8,300.00	7,078.60	9,985.50	9,947.40	262.144	SF
ABDN VERT BECKER #1 - Wellbore #1 - Design #1	6,488.59	6,339.81	1,193.39	1,050.64	8.360	CC
ABDN VERT BECKER #1 - Wellbore #1 - Design #1	6,500.00	6,351.22	1,193.48	1,048.00	8.204	ES
ABDN VERT BECKER #1 - Wellbore #1 - Design #1	6,550.00	6,401.15	1,196.00	1,050.03	8.193	SF
ABDN VERT DEROO WILFRED #1 - Wellbore #1 - Well	6,499.55	6,439.86	9,052.62	9,029.77	396.201	CC
ABDN VERT DEROO WILFRED #1 - Wellbore #1 - Well	6,500.00	6,440.05	9,052.62	9,029.77	396.196	ES
ABDN VERT DEROO WILFRED #1 - Wellbore #1 - Well	7,800.00	6,743.50	9,923.02	9,896.21	370.106	SF
ABDN VERT FRANK #21-32 - Wellbore #1 - Wellbore #1						Out of range
ABDN VERT HEITMAN K #34-4 - Wellbore #1 - Wellbore	559.13	481.14	3,974.62	3,973.11	2,635.841	CC
ABDN VERT HEITMAN K #34-4 - Wellbore #1 - Wellbore	600.00	518.63	3,974.71	3,973.10	2,470.471	ES
ABDN VERT HEITMAN K #34-4 - Wellbore #1 - Wellbore	14,300.00	7,039.55	9,933.11	9,730.41	49.004	SF
ABDN VERT HSR-SPILMAN #9-35 - Wellbore #1 - Wellb	14,519.45	7,046.64	1,210.06	1,001.54	5.803	CC, ES
ABDN VERT HSR-SPILMAN #9-35 - Wellbore #1 - Wellb	14,700.00	7,046.67	1,223.45	1,009.88	5.729	SF
ABDN VERT JOHNSON UPRR #31-35 - Wellbore #1 - W	13,076.84	6,900.00	3,780.29	3,612.17	22.486	CC
ABDN VERT JOHNSON UPRR #31-35 - Wellbore #1 - W	13,200.00	6,900.00	3,782.30	3,610.74	22.047	ES
ABDN VERT JOHNSON UPRR #31-35 - Wellbore #1 - W	15,000.00	6,900.00	4,241.36	4,019.46	19.114	SF
ABDN VERT RAYMOND MARTIN GU #1 - Wellbore #1 -	100.00	14.21	2,217.52	2,217.43	10,000.000	CC, ES
ABDN VERT RAYMOND MARTIN GU #1 - Wellbore #1 -	14,300.00	7,018.09	6,586.01	6,383.50	32.521	SF
ABDN VERT SWEET VALLEY FARMS-UPRR #41-33 - W	500.00	411.00	4,655.62	4,647.43	568.131	CC
ABDN VERT SWEET VALLEY FARMS-UPRR #41-33 - W	6,500.00	6,319.22	4,747.91	4,599.88	32.076	ES
ABDN VERT SWEET VALLEY FARMS-UPRR #41-33 - W	6,650.00	6,467.86	4,758.90	4,609.24	31.797	SF
ABDN VERT TANNER K FED #33-12 - Wellbore #1 - We	5,415.32	5,123.07	7,113.67	7,092.30	332.884	CC, ES
ABDN VERT TANNER K FED #33-12 - Wellbore #1 - We	9,800.00	7,101.42	9,989.85	9,912.30	128.808	SF
ABDN VERT UPRR 21 PAN AM K #1 - Wellbore #1 - De	11,992.81	7,050.43	1,298.60	1,022.95	4.711	CC
ABDN VERT UPRR 21 PAN AM K #1 - Wellbore #1 - De	12,000.00	7,050.40	1,298.62	1,022.77	4.708	ES
ABDN VERT UPRR 21 PAN AM K #1 - Wellbore #1 - De	12,200.00	7,049.60	1,315.03	1,033.62	4.673	SF
CHATFIELD 10N - ORIGINAL WELLBORE - PROPOSA	348.72	283.72	3,072.84	3,071.69	2,683.595	CC
CHATFIELD 10N - ORIGINAL WELLBORE - PROPOSA	15,088.01	16,425.51	3,494.71	3,009.88	7.208	ES, SF
CHATFIELD 11N - ORIGINAL WELLBORE - PROPOSAL	448.74	383.74	3,066.85	3,065.25	1,923.185	CC
CHATFIELD 11N - ORIGINAL WELLBORE - PROPOSAL	15,088.01	16,517.21	3,184.80	2,699.90	6.568	ES, SF
CHATFIELD 12N - ORIGINAL WELLBORE - PROPOSA	9,238.64	10,622.95	2,822.99	2,663.19	17.666	CC
CHATFIELD 12N - ORIGINAL WELLBORE - PROPOSA	15,088.01	16,471.72	2,874.87	2,390.87	5.940	ES, SF
CHATFIELD 13N - ORIGINAL WELLBORE - PROPOSA	9,238.41	10,762.56	2,512.44	2,352.55	15.713	CC
CHATFIELD 13N - ORIGINAL WELLBORE - PROPOSA	15,088.01	16,611.63	2,565.00	2,081.01	5.300	ES, SF
CHATFIELD 14N - ORIGINAL WELLBORE - PROPOSA	9,238.68	10,776.72	2,193.33	2,033.61	13.732	CC
CHATFIELD 14N - ORIGINAL WELLBORE - PROPOSA	15,088.01	16,625.52	2,245.08	1,761.22	4.640	ES, SF
CHATFIELD 15N - ORIGINAL WELLBORE - PROPOSA	9,238.38	10,955.22	1,902.82	1,742.65	11.880	CC
CHATFIELD 15N - ORIGINAL WELLBORE - PROPOSA	14,800.00	16,509.62	1,952.62	1,483.88	4.166	ES
CHATFIELD 15N - ORIGINAL WELLBORE - PROPOSA	15,000.00	16,509.62	1,965.34	1,490.99	4.143	SF
CHATFIELD 8N - ORIGINAL WELLBORE - PROPOSAL	500.00	436.00	3,055.12	3,053.29	1,671.888	CC, ES
CHATFIELD 8N - ORIGINAL WELLBORE - PROPOSAL	15,088.01	16,147.17	4,175.45	3,699.35	8.770	SF

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

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Site Error:	0.00 usft	**North Reference:**	True
Reference Well:	STEAMBOAT 14N	**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 9N - ORIGINAL WELLBORE - PROPOSAL	500.00	435.00	3,060.94	3,059.12	1,677.137	CC, ES
CHATFIELD 9N - ORIGINAL WELLBORE - PROPOSAL	15,088.01	16,513.64	3,809.63	3,324.79	7.857	SF
CHATFIELD FEDERAL 1N - ORIGINAL WELLBORE - P	147.92	83.92	2,995.10	2,994.83	10,000.000	CC, ES
CHATFIELD FEDERAL 1N - ORIGINAL WELLBORE - P	15,000.00	6,400.00	9,463.73	9,232.04	40.847	SF
CHATFIELD FEDERAL 2N - ORIGINAL WELLBORE - P	447.92	383.92	3,000.23	2,998.64	1,883.132	CC, ES
CHATFIELD FEDERAL 2N - ORIGINAL WELLBORE - P	15,000.00	6,400.00	9,263.66	9,032.91	40.146	SF
CHATFIELD FEDERAL 3N - ORIGINAL WELLBORE - P	1,249.06	1,500.00	2,949.50	2,943.28	474.251	CC
CHATFIELD FEDERAL 3N - ORIGINAL WELLBORE - P	1,300.00	1,526.45	2,949.71	2,943.24	456.146	ES
CHATFIELD FEDERAL 3N - ORIGINAL WELLBORE - P	15,000.00	6,350.00	9,158.79	8,929.55	39.952	SF
CHATFIELD FEDERAL 4N - ORIGINAL WELLBORE - P	2,600.00	2,872.47	2,822.02	2,807.19	190.201	CC
CHATFIELD FEDERAL 4N - ORIGINAL WELLBORE - P	2,618.38	2,900.00	2,822.14	2,807.17	188.575	ES
CHATFIELD FEDERAL 4N - ORIGINAL WELLBORE - P	15,000.00	6,450.00	9,041.66	8,812.35	39.430	SF
CHATFIELD FEDERAL 5N - ORIGINAL WELLBORE - P	4,214.96	4,500.00	2,704.15	2,678.94	107.270	CC, ES
CHATFIELD FEDERAL 5N - ORIGINAL WELLBORE - P	15,000.00	6,400.00	8,940.72	8,713.91	39.418	SF
CHATFIELD FEDERAL 6N - ORIGINAL WELLBORE - P	6,488.59	6,443.61	2,479.28	2,436.87	58.465	CC, ES
CHATFIELD FEDERAL 6N - ORIGINAL WELLBORE - P	15,000.00	6,500.00	8,843.53	8,616.10	38.884	SF
CHATFIELD FEDERAL 7N - ORIGINAL WELLBORE - P	6,400.00	6,455.35	2,114.18	2,066.49	44.329	CC, ES
CHATFIELD FEDERAL 7N - ORIGINAL WELLBORE - P	15,000.00	6,550.00	8,754.32	8,530.76	39.160	SF
EXIST DD HUNT K FEDERAL #33-19 - Wellbore #1 - W	6,407.89	6,331.66	6,968.01	6,948.99	366.241	CC
EXIST DD HUNT K FEDERAL #33-19 - Wellbore #1 - W	6,500.00	6,400.00	6,968.34	6,943.10	276.033	ES
EXIST DD HUNT K FEDERAL #33-19 - Wellbore #1 - W	10,100.00	7,300.00	9,929.47	9,841.30	112.610	SF
EXIST DD PIERSON #18-34 - Wellbore #1 - Wellbore #1	932.57	1,194.63	3,003.08	2,997.11	503.219	CC, ES
EXIST DD PIERSON #18-34 - Wellbore #1 - Wellbore #1	15,000.00	7,308.53	9,555.64	9,305.83	38.252	SF
EXIST DD PIERSON #22-34 - Wellbore #1 - Wellbore #1	6,498.14	6,851.77	2,076.98	2,016.03	34.076	CC
EXIST DD PIERSON #22-34 - Wellbore #1 - Wellbore #1	6,500.00	6,853.59	2,076.98	2,016.03	34.074	ES
EXIST DD PIERSON #22-34 - Wellbore #1 - Wellbore #1	6,550.00	6,902.25	2,077.81	2,016.80	34.054	SF
EXIST DD PIERSON #29-34 - Wellbore #1 - Wellbore #1	100.00	31.88	3,020.58	3,020.48	10,000.000	CC
EXIST DD PIERSON #29-34 - Wellbore #1 - Wellbore #1	200.00	122.98	3,020.83	3,020.47	8,475.019	ES
EXIST DD PIERSON #29-34 - Wellbore #1 - Wellbore #1	14,900.00	7,413.95	9,965.19	9,716.45	40.063	SF
EXIST HZ PEAKS #K26-77-1HN - Wellbore #1 - Wellbor	11,449.07	6,203.00	4,446.88	4,313.01	33.219	CC
EXIST HZ PEAKS #K26-77-1HN - Wellbore #1 - Wellbor	11,600.00	6,203.00	4,449.44	4,311.46	32.248	ES
EXIST HZ PEAKS #K26-77-1HN - Wellbore #1 - Wellbor	15,000.00	6,582.00	5,678.77	5,443.45	24.133	SF
EXIST HZ PEAKS #K26-78-1HN - Wellbore #1 - Wellbor	10,919.79	6,672.00	4,520.25	4,399.79	37.524	CC
EXIST HZ PEAKS #K26-78-1HN - Wellbore #1 - Wellbor	11,000.00	6,672.00	4,520.96	4,398.29	36.854	ES
EXIST HZ PEAKS #K26-78-1HN - Wellbore #1 - Wellbor	15,000.00	6,672.00	6,089.40	5,855.60	26.046	SF
EXIST HZ PEPPLER #K26-79-1HN - Wellbore #1 - Wellb	10,398.70	6,247.22	4,444.19	4,338.03	41.862	CC
EXIST HZ PEPPLER #K26-79-1HN - Wellbore #1 - Wellb	10,500.00	6,239.98	4,445.33	4,336.49	40.842	ES
EXIST HZ PEPPLER #K26-79-1HN - Wellbore #1 - Wellb	15,000.00	5,677.00	6,361.91	6,139.09	28.552	SF
EXIST HZ TANNER FED #K33-65HN - Wellbore #1 - We	6,700.00	12,826.00	2,577.60	2,424.92	16.883	ES
EXIST HZ TANNER FED #K33-65HN - Wellbore #1 - We	6,709.04	12,826.00	2,577.55	2,424.93	16.890	CC
EXIST HZ TANNER FED #K33-65HN - Wellbore #1 - We	7,500.00	12,826.00	2,918.26	2,736.56	16.060	SF
EXIST HZ TARIN FED #32W-234 - Wellbore #1 - Wellbo	6,451.59	6,466.00	7,835.21	7,802.65	240.677	CC
EXIST HZ TARIN FED #32W-234 - Wellbore #1 - Wellbo	6,500.00	6,466.00	7,835.45	7,788.46	166.761	ES
EXIST HZ TARIN FED #32W-234 - Wellbore #1 - Wellbo	9,042.46	6,554.00	9,974.61	9,905.10	143.505	SF
EXIST HZ WIEDMAN #29O-243 - Wellbore #1 - Wellbore						Out of range
EXIST VERT AGRI PROD FED #32-17 - Wellbore #1 - D	6,488.59	6,304.81	9,410.15	9,268.10	66.244	CC
EXIST VERT AGRI PROD FED #32-17 - Wellbore #1 - D	6,500.00	6,316.22	9,410.24	9,262.99	63.906	ES
EXIST VERT AGRI PROD FED #32-17 - Wellbore #1 - D	6,550.00	6,366.15	9,412.66	9,264.85	63.683	SF
EXIST VERT AGRI PROD INC #32-1F - Wellbore #1 - D	6,488.59	6,307.81	9,048.91	8,907.42	63.955	CC
EXIST VERT AGRI PROD INC #32-1F - Wellbore #1 - D	6,500.00	6,319.22	9,049.00	8,901.27	61.254	ES
EXIST VERT AGRI PROD INC #32-1F - Wellbore #1 - D	7,900.00	7,022.86	9,973.54	9,806.05	59.546	SF
EXIST VERT AGRI PROD INC #32-2F - Wellbore #1 - D						Out of range

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 14N
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 14N	**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 BERIG #17-35 - Wellbore #1 - Design #1	13,859.32	7,036.93	3,312.41	2,984.86	10.113	CC
EXIST VERT BERIG #17-35 - Wellbore #1 - Design #1	14,000.00	7,036.37	3,315.40	2,983.92	10.002	ES
EXIST VERT BERIG #17-35 - Wellbore #1 - Design #1	14,800.00	7,033.16	3,443.39	3,089.59	9.732	SF
EXIST VERT BIERIG UPRR #41-35 #2 - Wellbore #1 - W	14,627.15	6,956.77	3,688.60	3,477.00	17.432	CC
EXIST VERT BIERIG UPRR #41-35 #2 - Wellbore #1 - W	14,700.00	6,955.15	3,689.32	3,475.68	17.269	ES
EXIST VERT BIERIG UPRR #41-35 #2 - Wellbore #1 - W	15,088.01	6,946.78	3,717.27	3,493.66	16.624	SF
EXIST VERT BIERIG-UPRR #42-35 - Wellbore #1 - Well	14,399.07	7,060.36	2,467.84	2,262.56	12.022	CC
EXIST VERT BIERIG-UPRR #42-35 - Wellbore #1 - Well	14,500.00	7,060.18	2,469.90	2,261.80	11.868	ES
EXIST VERT BIERIG-UPRR #42-35 - Wellbore #1 - Well	15,000.00	7,059.28	2,539.95	2,317.85	11.436	SF
EXIST VERT BRUZEWSKI #33-15F - Wellbore #1 - Des	6,488.59	6,327.81	4,111.38	3,966.55	28.388	CC
EXIST VERT BRUZEWSKI #33-15F - Wellbore #1 - Des	6,500.00	6,339.22	4,111.47	3,966.21	28.305	ES
EXIST VERT BRUZEWSKI #33-15F - Wellbore #1 - Des	6,550.00	6,389.15	4,114.01	3,968.27	28.229	SF
EXIST VERT BRUZEWSKI #33-15F (2) - Wellbore #1 - W	5,506.09	5,346.04	4,299.30	4,280.67	230.773	CC, ES
EXIST VERT BRUZEWSKI #33-15F (2) - Wellbore #1 - W	12,500.00	6,974.18	9,916.75	9,819.68	102.163	SF
EXIST VERT BRUZEWSKI #33-16F - Wellbore #1 - Wel	6,505.93	6,427.42	2,881.34	2,860.26	136.715	CC, ES
EXIST VERT BRUZEWSKI #33-16F - Wellbore #1 - Wel	13,300.00	7,100.00	9,272.22	9,104.07	55.144	SF
EXIST VERT FRANK #32-24 - Wellbore #1 - Wellbore #1						Out of range
EXIST VERT HEITMAN #K34-5 - Wellbore #1 - Design #	1,779.93	1,688.69	2,878.75	2,840.56	75.379	CC
EXIST VERT HEITMAN #K34-5 - Wellbore #1 - Design #	6,500.00	6,336.22	2,965.34	2,817.26	20.026	ES
EXIST VERT HEITMAN #K34-5 - Wellbore #1 - Design #	6,650.00	6,484.86	2,975.70	2,825.83	19.855	SF
EXIST VERT HSR-BURMESTER #7-34 - Wellbore #1 - D	500.00	441.00	1,752.67	1,745.22	235.259	CC
EXIST VERT HSR-BURMESTER #7-34 - Wellbore #1 - D	600.00	540.98	1,754.29	1,744.61	181.158	ES
EXIST VERT HSR-BURMESTER #7-34 - Wellbore #1 - D	9,200.00	7,047.64	2,564.57	2,365.79	12.902	SF
EXIST VERT HSR-CARRICO #3-34 - Wellbore #1 - Desi	500.00	417.00	3,365.48	3,357.22	407.433	CC
EXIST VERT HSR-CARRICO #3-34 - Wellbore #1 - Desi	600.00	516.98	3,366.38	3,355.90	321.101	ES
EXIST VERT HSR-CARRICO #3-34 - Wellbore #1 - Desi	9,700.00	7,021.63	5,036.25	4,823.12	23.631	SF
EXIST VERT HSR-COLE #6-34 - Wellbore #1 - Design #	500.00	446.00	1,964.09	1,956.59	261.833	CC
EXIST VERT HSR-COLE #6-34 - Wellbore #1 - Design #	700.00	645.84	1,966.80	1,954.85	164.564	ES
EXIST VERT HSR-COLE #6-34 - Wellbore #1 - Design #	7,400.00	7,027.39	2,570.12	2,412.20	16.275	SF
EXIST VERT HSR-DIEFENBACH #10-34 - Wellbore #1 -	500.00	445.00	694.57	687.08	92.720	CC
EXIST VERT HSR-DIEFENBACH #10-34 - Wellbore #1 -	600.00	544.98	696.29	686.56	71.605	ES
EXIST VERT HSR-DIEFENBACH #10-34 - Wellbore #1 -	8,100.00	7,056.05	1,309.28	1,138.06	7.647	SF
EXIST VERT HSR-ENGSTROM #15-34 - Wellbore #1 - W	7,854.76	7,068.83	30.59	2.49	1.089	Level 2, CC, ES, SF
EXIST VERT HSR-FRAHM #9-34 - Wellbore #1 - Design	9,355.69	7,064.02	930.02	726.78	4.576	CC
EXIST VERT HSR-FRAHM #9-34 - Wellbore #1 - Design	9,400.00	7,063.84	931.08	726.65	4.554	ES
EXIST VERT HSR-FRAHM #9-34 - Wellbore #1 - Design	9,500.00	7,063.44	941.15	734.03	4.544	SF
EXIST VERT HSR-FRENCH #16-34 - Wellbore #1 - Wel	8,789.49	7,072.60	42.14	-8.41	0.834	Level 1, CC, ES, SF
EXIST VERT HSR-SCHMID #2-34 - Wellbore #1 - Desig	500.00	426.00	3,120.25	3,111.89	373.274	CC
EXIST VERT HSR-SCHMID #2-34 - Wellbore #1 - Desig	600.00	525.98	3,121.72	3,111.14	295.093	ES
EXIST VERT HSR-SCHMID #2-34 - Wellbore #1 - Desig	10,300.00	7,028.23	4,422.18	4,192.59	19.261	SF
EXIST VERT HSR-THOMAS #10-35 - Wellbore #1 - Wel	13,355.43	7,079.88	1,218.25	1,042.12	6.917	CC
EXIST VERT HSR-THOMAS #10-35 - Wellbore #1 - Wel	13,400.00	7,079.98	1,219.07	1,041.69	6.873	ES
EXIST VERT HSR-THOMAS #10-35 - Wellbore #1 - Wel	13,600.00	7,080.46	1,242.56	1,059.59	6.791	SF
EXIST VERT HSR-TRAIN #12-35 - Wellbore #1 - Wellbo	10,724.25	7,102.10	953.82	850.96	9.273	CC, ES
EXIST VERT HSR-TRAIN #12-35 - Wellbore #1 - Wellbo	11,000.00	7,105.69	992.88	882.38	8.986	SF
EXIST VERT JOHNSON #32-35 - Wellbore #1 - Design #	13,334.95	7,042.04	2,643.79	2,330.83	8.448	CC
EXIST VERT JOHNSON #32-35 - Wellbore #1 - Design #	13,400.00	7,041.78	2,644.59	2,329.81	8.401	ES
EXIST VERT JOHNSON #32-35 - Wellbore #1 - Design #	14,000.00	7,039.37	2,726.15	2,394.65	8.224	SF
EXIST VERT MARGHEIM #24-35 - Wellbore #1 - Design	13,951.38	7,056.56	1,755.87	1,425.55	5.316	CC
EXIST VERT MARGHEIM #24-35 - Wellbore #1 - Design	14,000.00	7,056.37	1,756.55	1,424.87	5.296	ES
EXIST VERT MARGHEIM #24-35 - Wellbore #1 - Design	14,200.00	7,055.57	1,773.39	1,436.13	5.258	SF
EXIST VERT SANDAU #24-34 - Wellbore #1 - Wellbore	5,471.85	5,323.29	598.76	581.29	34.269	CC

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 14N
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 14N	**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 SANDAU #24-34 - Wellbore #1 - Wellbore	5,499.22	5,351.20	598.86	577.89	28.548	ES
EXIST VERT SANDAU #24-34 - Wellbore #1 - Wellbore	6,488.59	6,341.47	602.86	580.58	27.051	SF
EXIST VERT SANDAU #34-11F - Wellbore #1 - Wellbore	2,323.31	2,218.37	1,081.08	1,072.22	122.136	CC
EXIST VERT SANDAU #34-11F - Wellbore #1 - Wellbore	2,600.00	2,497.26	1,082.06	1,071.86	106.118	ES
EXIST VERT SANDAU #34-11F - Wellbore #1 - Wellbore	15,000.00	6,540.14	8,676.79	8,473.13	42.605	SF
EXIST VERT SANDAU #34-12F - Wellbore #1 - Wellbore	6,489.57	6,344.22	2,195.62	2,171.79	92.121	CC, ES
EXIST VERT SANDAU #34-12F - Wellbore #1 - Wellbore	15,000.00	7,000.00	9,990.78	9,769.11	45.069	SF
EXIST VERT SARATOGA #1 - Wellbore #1 - Design #1	6,488.59	6,323.81	6,602.54	6,458.32	45.782	CC
EXIST VERT SARATOGA #1 - Wellbore #1 - Design #1	6,500.00	6,335.22	6,602.63	6,456.86	45.297	ES
EXIST VERT SARATOGA #1 - Wellbore #1 - Design #1	9,100.00	7,034.04	8,804.07	8,607.63	44.818	SF
EXIST VERT SHUTT #20-34 - Wellbore #1 - Wellbore #1	8,484.11	7,064.57	719.88	677.25	16.887	CC
EXIST VERT SHUTT #20-34 - Wellbore #1 - Wellbore #1	8,500.00	7,064.40	720.06	677.03	16.735	ES
EXIST VERT SHUTT #20-34 - Wellbore #1 - Wellbore #1	8,800.00	7,061.28	786.13	735.42	15.502	SF
EXIST VERT SHUTT #24-34 - Wellbore #1 - Design #1	500.00	449.00	1,519.76	1,512.22	201.765	CC
EXIST VERT SHUTT #24-34 - Wellbore #1 - Design #1	8,700.00	7,057.65	1,644.54	1,458.56	8.843	ES
EXIST VERT SHUTT #24-34 - Wellbore #1 - Design #1	9,200.00	7,055.64	1,705.35	1,506.49	8.576	SF
EXIST VERT SWEET VALLEY FARMS #31-33 2 - Wellb	5,170.46	4,985.41	5,844.44	5,724.60	48.767	CC
EXIST VERT SWEET VALLEY FARMS #31-33 2 - Wellb	6,500.00	6,314.22	5,844.54	5,696.33	39.434	ES
EXIST VERT SWEET VALLEY FARMS #31-33 2 - Wellb	11,700.00	7,002.60	9,959.68	9,691.67	37.161	SF
EXIST VERT TANNER K #33-11 - Wellbore #1 - Wellbore	6,498.03	6,400.00	5,734.72	5,712.17	254.365	CC, ES
EXIST VERT TANNER K #33-11 - Wellbore #1 - Wellbore	11,200.00	7,108.27	9,955.57	9,839.50	85.774	SF
EXIST VERT TANNER K #33-14 - Wellbore #1 - Wellbor	5,486.40	5,311.99	5,448.46	5,429.28	284.103	CC, ES
EXIST VERT TANNER K #33-14 - Wellbore #1 - Wellbor	11,400.00	7,049.28	9,956.05	9,834.53	81.925	SF
EXIST VERT UPRC #33-7F - Wellbore #1 - Wellbore #1	5,483.48	5,300.00	4,695.40	4,673.00	209.613	CC, ES
EXIST VERT UPRC #33-7F - Wellbore #1 - Wellbore #1	12,500.00	6,751.88	9,974.54	9,823.19	65.904	SF
EXIST VERT UPRC #33-8F - Wellbore #1 - Wellbore #1	4,881.82	4,650.08	3,683.15	3,662.13	175.275	CC
EXIST VERT UPRC #33-8F - Wellbore #1 - Wellbore #1	4,900.00	4,663.84	3,683.16	3,662.06	174.550	ES
EXIST VERT UPRC #33-8F - Wellbore #1 - Wellbore #1	13,700.00	6,982.82	9,965.04	9,779.36	53.667	SF
EXIST VERT UPRC #35-3F - Wellbore #1 - Wellbore #1	11,734.27	6,964.87	3,957.18	3,826.40	30.259	CC
EXIST VERT UPRC #35-3F - Wellbore #1 - Wellbore #1	11,800.00	6,967.05	3,957.73	3,825.12	29.845	ES
EXIST VERT UPRC #35-3F - Wellbore #1 - Wellbore #1	14,900.00	14,900.00	5,066.16	4,845.85	22.996	SF
EXIST VERT UPRC #35-4F - Wellbore #1 - Wellbore #1	10,567.64	7,052.44	3,757.07	3,658.66	38.176	CC
EXIST VERT UPRC #35-4F - Wellbore #1 - Wellbore #1	10,700.00	7,049.32	3,759.40	3,657.33	36.833	ES
EXIST VERT UPRC #35-4F - Wellbore #1 - Wellbore #1	14,600.00	6,947.37	5,510.23	5,299.50	26.149	SF
EXIST VERT UPRC #35-5F - Wellbore #1 - Wellbore #1	10,558.73	7,033.65	2,304.75	2,206.61	23.484	CC
EXIST VERT UPRC #35-5F - Wellbore #1 - Wellbore #1	10,600.00	7,032.34	2,305.12	2,205.84	23.219	ES
EXIST VERT UPRC #35-5F - Wellbore #1 - Wellbore #1	12,100.00	6,978.33	2,771.99	2,631.15	19.682	SF
EXIST VERT UPRC #35-6F - Wellbore #1 - Wellbore #1	11,658.28	6,988.33	2,439.38	2,310.72	18.960	CC
EXIST VERT UPRC #35-6F - Wellbore #1 - Wellbore #1	11,700.00	6,988.31	2,439.74	2,309.92	18.794	ES
EXIST VERT UPRC #35-6F - Wellbore #1 - Wellbore #1	13,000.00	6,987.48	2,784.02	2,617.97	16.766	SF
EXIST VERT UPRC FEDERAL #33-3F - Wellbore #1 - W	6,500.86	6,394.85	6,515.13	6,491.31	273.569	CC, ES
EXIST VERT UPRC FEDERAL #33-3F - Wellbore #1 - W	10,800.00	7,023.32	9,957.17	9,851.95	94.632	SF
EXIST VERT UPRC FEDERAL #33-4F - Wellbore #1 - D	6,488.59	6,304.81	7,648.05	7,506.87	54.175	CC
EXIST VERT UPRC FEDERAL #33-4F - Wellbore #1 - D	6,500.00	6,316.22	7,648.13	7,500.22	51.709	ES
EXIST VERT UPRC FEDERAL #33-4F - Wellbore #1 - D	9,400.00	7,013.84	9,923.59	9,718.68	48.429	SF
EXIST VERT UPRC FEDERAL #33-5K - Wellbore #1 - W	5,993.40	5,800.00	7,673.94	7,657.01	453.016	CC
EXIST VERT UPRC FEDERAL #33-5K - Wellbore #1 - W	6,501.54	6,415.35	7,677.24	7,654.12	332.025	ES
EXIST VERT UPRC FEDERAL #33-5K - Wellbore #1 - W	9,300.00	7,056.85	9,945.00	9,880.69	154.637	SF
EXIST VERT UPRC FEDERAL #33-6F - Wellbore #1 - W	6,508.01	6,470.46	6,249.20	6,225.82	267.305	CC, ES
EXIST VERT UPRC FEDERAL #33-6F - Wellbore #1 - W	10,900.00	7,200.00	9,993.50	9,885.78	92.772	SF
EXIST VERT UPRC K #35-19 - Wellbore #1 - Wellbore #	11,346.74	6,700.00	3,116.87	2,997.51	26.114	CC
EXIST VERT UPRC K #35-19 - Wellbore #1 - Wellbore #	11,400.00	6,700.00	3,117.32	2,996.50	25.800	ES

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 14N
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 14N	**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 UPRC K #35-19 - Wellbore #1 - Wellbore #	13,600.00	6,700.00	3,846.04	3,664.16	21.146	SF
EXIST VERT WEBER K #33-10 - Wellbore #1 - Design #	6,488.59	6,323.81	4,378.90	4,236.15	30.676	CC
EXIST VERT WEBER K #33-10 - Wellbore #1 - Design #	6,500.00	6,335.22	4,378.98	4,231.94	29.780	ES
EXIST VERT WEBER K #33-10 - Wellbore #1 - Design #	6,550.00	6,385.15	4,381.46	4,233.89	29.691	SF
EXIST VERT WEBER K #33-9 - Wellbore #1 - Design #1	6,488.59	6,331.81	3,269.22	3,126.87	22.965	CC
EXIST VERT WEBER K #33-9 - Wellbore #1 - Design #1	6,500.00	6,343.22	3,269.31	3,121.81	22.165	ES
EXIST VERT WEBER K #33-9 - Wellbore #1 - Design #1	6,550.00	6,393.15	3,271.73	3,123.69	22.099	SF
EXIST VERT WILLIAMS #41-34-1 - Wellbore #1 - Design	500.00	426.00	3,607.71	3,599.35	431.588	CC
EXIST VERT WILLIAMS #41-34-1 - Wellbore #1 - Design	600.00	525.98	3,609.42	3,598.84	341.241	ES
EXIST VERT WILLIAMS #41-34-1 - Wellbore #1 - Design	11,300.00	7,024.21	4,322.68	4,065.52	16.810	SF
EXIST VERT WILLIAMS #42-34 - Wellbore #1 - Design #	9,416.06	7,045.77	2,609.30	2,404.62	12.748	CC
EXIST VERT WILLIAMS #42-34 - Wellbore #1 - Design #	9,500.00	7,045.44	2,610.65	2,403.71	12.615	ES
EXIST VERT WILLIAMS #42-34 - Wellbore #1 - Design #	10,300.00	7,042.23	2,754.96	2,526.23	12.045	SF
NE NW SEC. 2 T3N R66W 6th P.M. (EL DORADO)						
EL DORADO 1N - ORIGINAL WELLBORE - PROPOSAL	10,141.43	7,087.71	640.86	538.79	6.279	CC, ES
EL DORADO 1N - ORIGINAL WELLBORE - PROPOSAL	10,200.00	7,087.57	643.53	540.11	6.222	SF
EL DORADO 2N - ORIGINAL WELLBORE - PROPOSAL	10,486.35	7,050.00	589.97	481.61	5.445	CC
EL DORADO 2N - ORIGINAL WELLBORE - PROPOSAL	10,500.00	7,050.00	590.13	481.44	5.429	ES
EL DORADO 2N - ORIGINAL WELLBORE - PROPOSAL	10,600.00	7,050.00	600.82	489.70	5.407	SF
EL DORADO 3N - ORIGINAL WELLBORE - PROPOSAL	10,826.42	6,950.00	640.68	531.19	5.851	CC, ES
EL DORADO 3N - ORIGINAL WELLBORE - PROPOSAL	10,900.00	6,950.00	644.90	533.65	5.797	SF
EL DORADO 4N - ORIGINAL WELLBORE - PROPOSAL	11,156.20	6,950.00	590.34	473.83	5.067	CC, ES
EL DORADO 4N - ORIGINAL WELLBORE - PROPOSAL	11,200.00	6,950.00	591.97	474.38	5.034	SF
EL DORADO 5N - ORIGINAL WELLBORE - PROPOSAL	11,436.23	6,900.00	640.44	521.66	5.392	CC, ES
EL DORADO 5N - ORIGINAL WELLBORE - PROPOSAL	11,500.00	6,900.00	643.61	523.30	5.350	SF
EL DORADO 6N - ORIGINAL WELLBORE - PROPOSAL	11,780.72	6,950.00	590.25	459.27	4.506	CC
EL DORADO 6N - ORIGINAL WELLBORE - PROPOSAL	11,800.00	6,950.00	590.56	459.10	4.492	ES, SF
EL DORADO 7N - ORIGINAL WELLBORE - PROPOSAL	12,046.05	6,900.00	640.53	506.83	4.791	CC, ES
EL DORADO 7N - ORIGINAL WELLBORE - PROPOSAL	12,100.00	6,900.00	642.79	507.80	4.762	SF
EL DORADO 8N - ORIGINAL WELLBORE - PROPOSAL	12,395.67	6,950.00	590.25	442.64	3.999	CC
EL DORADO 8N - ORIGINAL WELLBORE - PROPOSAL	12,400.00	6,950.00	590.27	442.54	3.996	ES
EL DORADO 8N - ORIGINAL WELLBORE - PROPOSAL	12,500.00	6,950.00	599.40	449.22	3.991	SF

Company:	PDC ENERGY	**Local Co-ordinate Reference:**	Well STEAMBOAT 14N
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 14N	**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 NE SEC. 3 T3N R66W 6th P.M. (TRIPPETT)						
TRIPPETT 1N - ORIGINAL WELLBORE - PROPOSAL #	6,550.00	6,538.56	742.06	698.95	17.213	SF
TRIPPETT 1N - ORIGINAL WELLBORE - PROPOSAL #	7,441.15	6,912.26	581.87	549.30	17.867	CC
TRIPPETT 1N - ORIGINAL WELLBORE - PROPOSAL #	7,450.00	6,913.26	581.91	549.29	17.839	ES
TRIPPETT 2N - ORIGINAL WELLBORE - PROPOSAL #	7,810.03	6,882.34	632.56	595.95	17.280	CC, ES
TRIPPETT 2N - ORIGINAL WELLBORE - PROPOSAL #	8,000.00	6,881.99	660.47	620.54	16.541	SF
TRIPPETT 3N - ORIGINAL WELLBORE - PROPOSAL #	8,156.10	6,950.00	584.37	537.69	12.519	CC, ES
TRIPPETT 3N - ORIGINAL WELLBORE - PROPOSAL #	8,300.00	6,950.00	601.83	552.18	12.122	SF
TRIPPETT 4N - ORIGINAL WELLBORE - PROPOSAL #	8,446.16	6,950.00	628.76	574.40	11.565	CC, ES
TRIPPETT 4N - ORIGINAL WELLBORE - PROPOSAL #	8,600.00	6,950.00	647.31	589.66	11.228	SF
TRIPPETT 5N - ORIGINAL WELLBORE - PROPOSAL #	8,740.93	7,050.00	580.87	514.29	8.724	CC, ES
TRIPPETT 5N - ORIGINAL WELLBORE - PROPOSAL #	8,859.45	7,050.00	592.84	523.55	8.556	SF
TRIPPETT 6N - ORIGINAL WELLBORE - PROPOSAL #	8,993.73	7,067.86	630.35	555.77	8.452	CC
TRIPPETT 6N - ORIGINAL WELLBORE - PROPOSAL #	9,000.00	7,067.72	630.39	555.66	8.436	ES
TRIPPETT 6N - ORIGINAL WELLBORE - PROPOSAL #	9,100.00	7,064.95	640.80	563.98	8.341	SF
TRIPPETT 7N - ORIGINAL WELLBORE - PROPOSAL #	9,446.50	7,226.24	594.56	500.68	6.333	CC, ES
TRIPPETT 7N - ORIGINAL WELLBORE - PROPOSAL #	9,500.00	7,226.11	596.96	501.82	6.274	SF
TRIPPETT 8N - ORIGINAL WELLBORE - PROPOSAL #	9,756.57	7,300.00	638.29	534.02	6.121	CC, ES
TRIPPETT 8N - ORIGINAL WELLBORE - PROPOSAL #	9,800.00	7,300.00	639.77	534.48	6.076	SF
TRIPPETT 9N - ORIGINAL WELLBORE - PROPOSAL #	7,346.32	7,296.84	1,059.62	1,022.45	28.513	CC, ES
TRIPPETT 9N - ORIGINAL WELLBORE - PROPOSAL #	8,400.00	6,785.79	1,304.68	1,251.87	24.705	SF

Company:	PDC ENERGY	**Local Co-ordinate Reference:**	Well STEAMBOAT 14N
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 14N	**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 #	14,269.21	7,064.77	218.40	16.67	1.083	Level 2, CC, ES, SF
EXIST HZ LORENZ 23-35 - Wellbore #1 - Wellbore #1	12,474.79	7,057.62	515.66	364.22	3.405	CC
EXIST HZ LORENZ 23-35 - Wellbore #1 - Wellbore #1	12,500.00	7,057.44	516.28	364.13	3.393	ES, SF
EXIST VERT CLIFFORD L3-29 - Wellbore #1 - Wellbore	5,461.93	5,312.39	1,482.24	1,467.23	98.753	CC
EXIST VERT CLIFFORD L3-29 - Wellbore #1 - Wellbore	5,499.22	5,352.41	1,482.45	1,459.86	65.612	ES
EXIST VERT CLIFFORD L3-29 - Wellbore #1 - Wellbore	15,000.00	7,047.94	9,193.69	8,971.62	41.402	SF
EXIST VERT HSR-BIG GEORGE #14-35 - Wellbore #1 -	11,575.06	7,084.11	137.20	-129.19	0.515	Level 1, CC, ES, SF
STEAMBOAT 10N - ORIGINAL WELLBORE - PROPOSA	400.00	400.00	59.96	58.44	39.407	CC
STEAMBOAT 10N - ORIGINAL WELLBORE - PROPOSA	500.00	499.95	60.00	58.04	30.618	ES
STEAMBOAT 10N - ORIGINAL WELLBORE - PROPOSA	15,088.01	15,070.27	1,244.66	799.53	2.796	SF
STEAMBOAT 11N - ORIGINAL WELLBORE - PROPOSA	500.00	500.00	44.99	43.02	22.825	CC, ES
STEAMBOAT 11N - ORIGINAL WELLBORE - PROPOSA	15,088.01	15,146.29	973.45	529.58	2.193	SF
STEAMBOAT 12N - ORIGINAL WELLBORE - PROPOSA	500.00	500.00	29.98	28.01	15.210	CC, ES
STEAMBOAT 12N - ORIGINAL WELLBORE - PROPOSA	15,088.01	15,057.29	594.84	149.19	1.335	Level 3, SF
STEAMBOAT 13N - ORIGINAL WELLBORE - PROPOSA	500.00	500.00	15.01	13.04	7.614	CC
STEAMBOAT 13N - ORIGINAL WELLBORE - PROPOSA	15,088.01	15,155.93	297.32	-131.09	0.694	Level 1, ES, SF
STEAMBOAT 15N - ORIGINAL WELLBORE - PROPOSA	400.00	400.00	15.01	13.49	9.864	CC
STEAMBOAT 15N - ORIGINAL WELLBORE - PROPOSA	15,088.01	15,201.42	360.13	-72.14	0.833	Level 1, ES, SF
STEAMBOAT 16N - ORIGINAL WELLBORE - PROPOSA	300.00	300.00	29.98	28.91	27.965	CC, ES
STEAMBOAT 16N - ORIGINAL WELLBORE - PROPOSA	14,800.00	14,826.00	680.28	253.12	1.593	SF
STEAMBOAT 1N - ORIGINAL WELLBORE - PROPOSA	300.00	300.00	194.95	193.88	181.831	CC, ES
STEAMBOAT 1N - ORIGINAL WELLBORE - PROPOSA	9,300.00	6,750.00	2,257.60	2,183.08	30.295	SF
STEAMBOAT 2N - ORIGINAL WELLBORE - PROPOSA	400.00	400.00	179.97	178.44	118.269	CC, ES
STEAMBOAT 2N - ORIGINAL WELLBORE - PROPOSA	8,600.00	6,716.55	1,594.87	1,539.86	28.996	SF
STEAMBOAT 3N - ORIGINAL WELLBORE - PROPOSA	500.00	500.00	164.96	162.99	83.684	CC, ES
STEAMBOAT 3N - ORIGINAL WELLBORE - PROPOSA	7,800.00	6,950.00	903.19	864.11	23.110	SF
STEAMBOAT 4N - ORIGINAL WELLBORE - PROPOSA	500.00	500.00	149.95	147.98	76.069	CC, ES
STEAMBOAT 4N - ORIGINAL WELLBORE - PROPOSA	7,150.00	7,252.01	547.78	512.01	15.314	SF
STEAMBOAT 5N - ORIGINAL WELLBORE - PROPOSA	500.00	500.00	134.97	133.00	68.474	CC, ES
STEAMBOAT 5N - ORIGINAL WELLBORE - PROPOSA	7,350.00	7,218.58	210.13	175.15	6.007	SF
STEAMBOAT 6N - ORIGINAL WELLBORE - PROPOSA	7,259.64	7,253.19	90.03	54.33	2.522	CC, ES, SF
STEAMBOAT 7N - ORIGINAL WELLBORE - PROPOSA	500.00	500.00	104.96	102.98	53.245	CC, ES
STEAMBOAT 7N - ORIGINAL WELLBORE - PROPOSA	7,426.09	7,262.81	423.98	386.54	11.326	SF
STEAMBOAT 8N - ORIGINAL WELLBORE - PROPOSA	500.00	500.00	89.98	88.01	45.649	CC, ES
STEAMBOAT 8N - ORIGINAL WELLBORE - PROPOSA	2,100.00	2,106.10	207.52	194.41	15.830	SF
STEAMBOAT 9N - ORIGINAL WELLBORE - PROPOSA	300.00	300.00	74.97	73.90	69.930	CC
STEAMBOAT 9N - ORIGINAL WELLBORE - PROPOSA	500.00	499.66	75.32	73.36	38.553	ES
STEAMBOAT 9N - ORIGINAL WELLBORE - PROPOSA	15,088.01	15,179.52	1,521.96	1,077.71	3.426	SF

Company:	PDC ENERGY	**Local Co-ordinate Reference:**	Well STEAMBOAT 14N
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 14N	**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	5,309.22	4,828.70	8,428.24	8,407.87	413.712	CC, ES
EXIST VERT FLOYD #1 - Wellbore #1 - Wellbore #1	8,400.00	7,015.70	9,929.92	9,889.38	244.963	SF
EXIST VERT FLOYD #5 - Wellbore #1 - Wellbore #1	6,496.15	6,420.07	8,636.95	8,615.70	406.302	CC, ES
EXIST VERT FLOYD #5 - Wellbore #1 - Wellbore #1	8,200.00	7,200.00	9,927.52	9,898.58	343.081	SF
EXIST VERT GLEN #44-32 - Wellbore #1 - Wellbore #1	6,444.78	6,273.61	8,129.98	8,109.71	401.008	CC
EXIST VERT GLEN #44-32 - Wellbore #1 - Wellbore #1	6,500.00	6,333.54	8,130.09	8,109.02	385.876	ES
EXIST VERT GLEN #44-32 - Wellbore #1 - Wellbore #1	8,700.00	7,123.14	9,922.04	9,877.30	221.789	SF
TARIN FEDERAL 32W-234 - JOB #2015-138-135 - FINA	6,453.59	6,466.00	7,835.21	7,802.59	240.198	CC
TARIN FEDERAL 32W-234 - JOB #2015-138-135 - FINA	6,500.00	6,466.00	7,835.43	7,788.43	166.697	ES
TARIN FEDERAL 32W-234 - JOB #2015-138-135 - FINA	9,042.46	6,554.00	9,974.48	9,904.91	143.368	SF
TARIN FEDERAL 32W-434 - JOB #2015-139-135 - FINA	6,489.77	6,430.83	7,754.37	7,712.93	187.137	CC, ES
TARIN FEDERAL 32W-434 - JOB #2015-139-135 - FINA	9,100.00	6,639.00	9,954.02	9,884.00	142.167	SF
TARIN FEDERAL 32X-204 - JOB #2015-141-135 - FINAL	5,453.84	5,287.00	7,691.17	7,660.61	251.687	CC
TARIN FEDERAL 32X-204 - JOB #2015-141-135 - FINAL	6,500.00	6,279.00	7,693.00	7,659.35	228.585	ES
TARIN FEDERAL 32X-204 - JOB #2015-141-135 - FINAL	9,072.46	6,369.00	9,894.06	9,832.65	161.135	SF
TARIN FEDERAL 32X-314 - JOB #2015-140-135 - FINAL	5,496.89	5,402.69	7,747.60	7,712.16	218.583	CC
TARIN FEDERAL 32X-314 - JOB #2015-140-135 - FINAL	6,489.13	6,404.39	7,748.84	7,710.70	203.160	ES
TARIN FEDERAL 32X-314 - JOB #2015-140-135 - FINAL	9,100.00	6,548.00	9,959.95	9,892.62	147.938	SF
TARIN FEDERAL 32X-334 - JOB #2015-142-135 - FINAL	6,491.73	6,380.00	7,695.44	7,662.68	234.929	CC, ES
TARIN FEDERAL 32X-334 - JOB #2015-142-135 - FINAL	9,072.46	6,470.00	9,888.75	9,827.83	162.322	SF
TARIN FEDERAL 32Y-214 - JOB #2015-143-135 - FINAL	5,596.87	5,478.88	7,692.81	7,662.97	257.790	CC
TARIN FEDERAL 32Y-214 - JOB #2015-143-135 - FINAL	6,488.88	6,374.19	7,696.58	7,662.04	222.834	ES
TARIN FEDERAL 32Y-214 - JOB #2015-143-135 - FINAL	9,072.46	6,467.00	9,893.74	9,847.39	213.450	SF
TARIN FEDERAL 32Y-314 - JOB#2015-144-135 - FINAL	5,400.00	5,348.09	7,710.37	7,676.20	225.652	ES
TARIN FEDERAL 32Y-314 - JOB#2015-144-135 - FINAL	5,554.15	5,471.00	7,708.77	7,678.44	254.138	CC
TARIN FEDERAL 32Y-314 - JOB#2015-144-135 - FINAL	8,859.45	6,506.39	9,693.83	9,642.06	187.277	SF
TARIN FEDERAL 32Y-404 - JOB# 2015-145-135 - FINAL	6,490.48	6,433.71	7,731.58	7,693.04	200.589	CC, ES
TARIN FEDERAL 32Y-404 - JOB# 2015-145-135 - FINAL	8,859.45	6,601.18	9,699.47	9,641.51	167.365	SF
SW NE SEC. 5 T3N R66W 6th P.M. (NAVAJO)						
EXIST DD BRIGHT L #3-30D - Wellbore #1 - Wellbore #1	6,488.59	6,485.53	2,570.66	2,531.18	65.111	ES
EXIST DD BRIGHT L #3-30D - Wellbore #1 - Wellbore #1	6,498.91	6,494.43	2,570.59	2,537.88	78.577	CC
EXIST DD BRIGHT L #3-30D - Wellbore #1 - Wellbore #1	14,400.00	7,176.00	9,938.30	9,717.09	44.926	SF
EXIST DD WEBBER #29-4 - Wellbore #1 - Wellbore #1	5,480.76	5,434.30	6,330.48	6,298.88	200.317	CC
EXIST DD WEBBER #29-4 - Wellbore #1 - Wellbore #1	5,499.22	5,451.94	6,330.53	6,291.74	163.206	ES
EXIST DD WEBBER #29-4 - Wellbore #1 - Wellbore #1	10,500.00	7,100.92	9,927.11	9,811.25	85.682	SF

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

Survey Program: 0-MWD

Offset Site Error: 0.00 usft

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	2,035.93	1,981.29	0.00	8.88	105.84	-1,758.58	6,197.13	6,735.23				
100.00	100.00	2,131.15	2,071.97	0.09	9.49	105.76	-1,742.47	6,172.93	6,706.04	6,697.44	8.60	779.769	
200.00	200.00	2,226.38	2,162.65	0.31	10.09	105.68	-1,726.35	6,148.73	6,676.86	6,667.50	9.36	713.106	
300.00	300.00	2,321.60	2,253.33	0.54	10.70	105.60	-1,710.24	6,124.53	6,647.70	6,637.57	10.13	656.384	
400.00	400.00	2,416.83	2,344.00	0.76	11.31	105.52	-1,694.12	6,100.33	6,618.55	6,607.65	10.89	607.542	
500.00	500.00	2,512.05	2,434.68	0.99	11.92	105.44	-1,678.01	6,076.13	6,589.41	6,577.75	11.66	565.052	
600.00	599.98	2,607.33	2,525.41	1.19	12.52	-116.20	-1,661.89	6,051.92	6,561.01	6,552.33	8.68	756.032	
700.00	699.84	2,702.62	2,616.15	1.38	13.13	-116.82	-1,645.76	6,027.71	6,534.12	6,524.86	9.26	705.702	

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