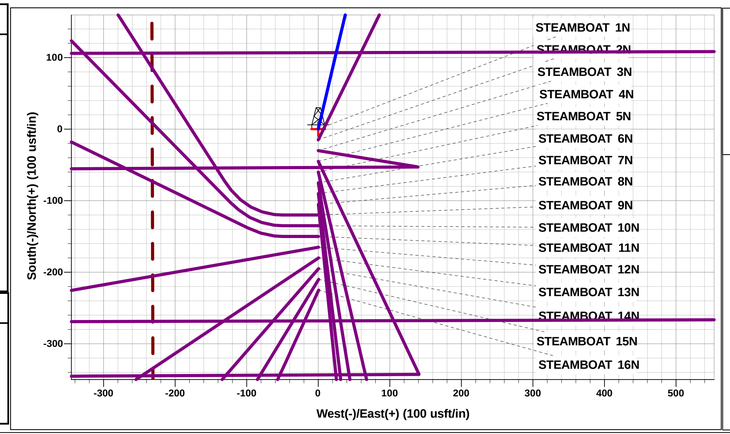
Project: WELD COUNTY, COLORADO (TRUE)
Site: NW SE SEC. 34 T4N R66W 6th P.M. (STEAMBOAT)
Well: STEAMBOAT 1N
Wellbore: ORIGINAL WELLBORE
Design: PROPOSAL #1

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: 1723ft FSL & 2432ft FEL of Sec 34
300.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00	START NUDGE (2°/100ft BUR)
895.62	900.00	12.00	13.31	60.92	14.41	-10.21	62.60	EOB TO 12° INC
3096.63	3150.18	12.00	13.31	516.20	122.09	-86.50	530.44	END OF TANGENT
3692.25	3750.18	0.00	0.00	577.12	136.50	-96.71	593.04	EOD TO VERTICAL
6496.81	6554.74	0.00	0.00	577.12	136.50	-96.71	593.04	KOP (8°/100ft BUR)
7188.60	7492.23	75.00	269.69	574.25	-394.32	432.67	1123.87	EP: 2300ft FSL & 2500ft FWL of Sec 34
7213.00	7679.73	90.00	269.69	573.25	-579.68	617.53	1309.24	HZ LANDING POINT
7213.00	14901.13	90.00	269.70	534.79	-7800.98	7819.29	8530.64	BHL: 2300ft FSL & 400ft FWL of Sec 33

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude
KOP - STEAMBOAT 1N	6496.81	577.12	136.50	40.267337°N	104.762068°W
EP - STEAMBOAT 1N	7188.60	574.25	-394.32	40.267330°N	104.763970°W
BHL - STEAMBOAT 1N	7213.00	534.79	-7800.98	40.267218°N	104.790511°W
SHL - STEAMBOAT 1N	0.00	0.00	0.00	40.265753°N	104.762557°W

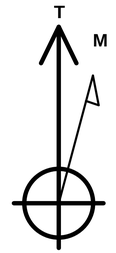


PROPOSED LOCAL COORDINATES:

SHL: 1723ft FSL & 2432ft FEL of Sec 34

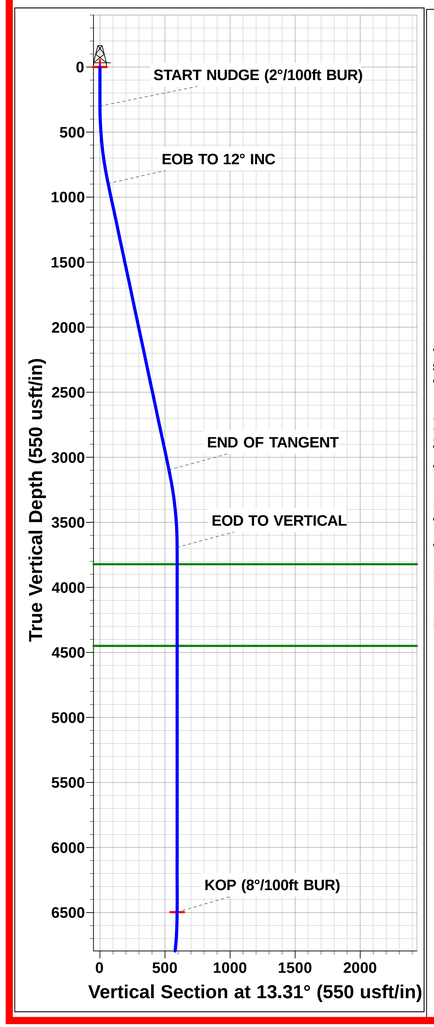
EP: 2300ft FSL & 2500ft FWL of Sec 34

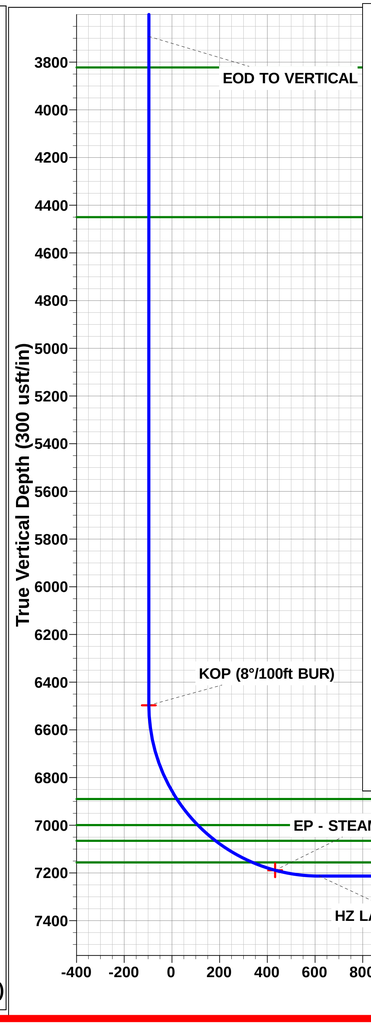
BHL: 2300ft FSL & 400ft FWL of Sec 33

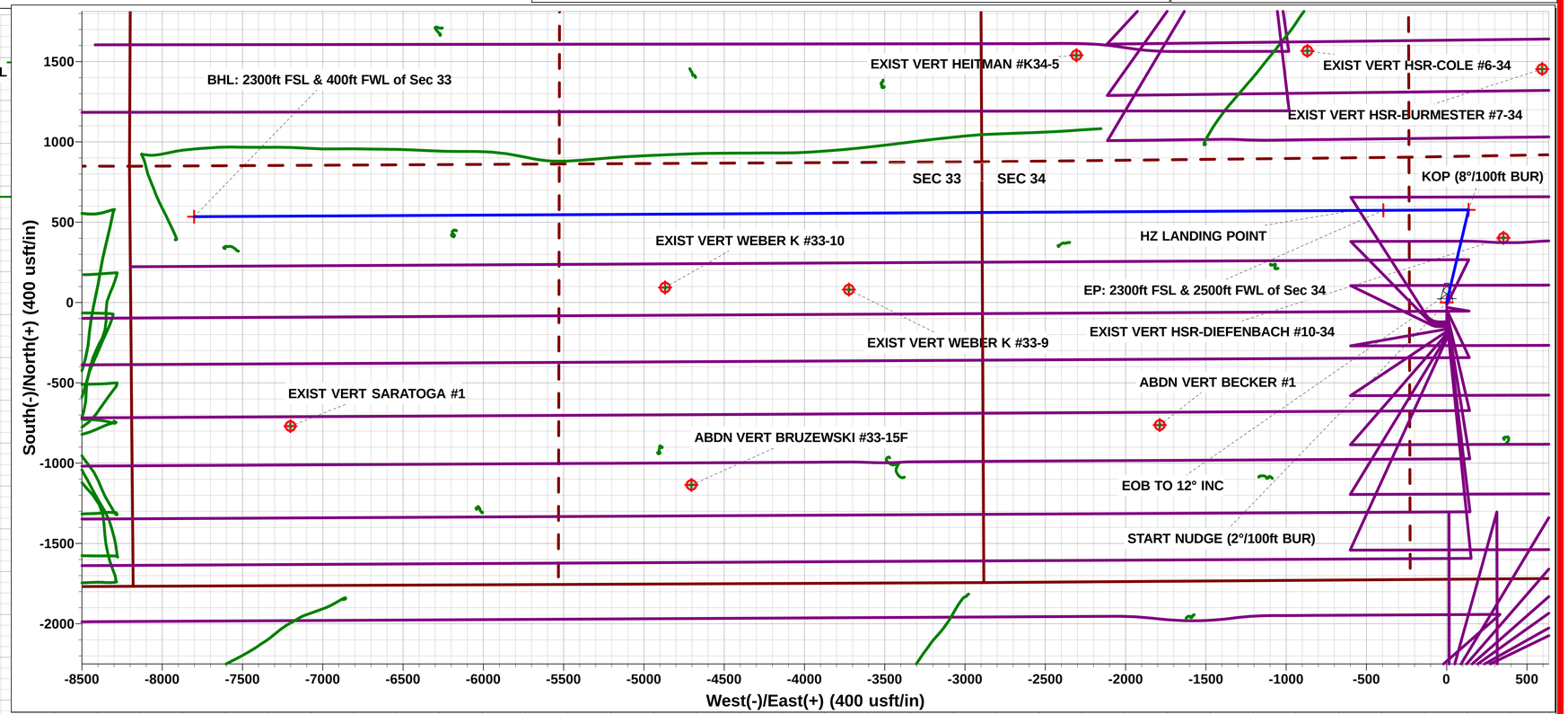


Azimuths to True North
Magnetic North: 8.03°

Magnetic Field
Strength: 52140.0snT
Dip Angle: 66.71°
Date: 23/01/2019
Model: IGRF2015







PDC ENERGY

WELD COUNTY, COLORADO (TRUE)
NW SE SEC. 34 T4N R66W 6th P.M. (STEAMBOAT)
STEAMBOAT 1N

ORIGINAL WELLBORE
PROPOSAL #1

Anticollision Report

25 January, 2019

Company:	PDC ENERGY	**Local Co-ordinate Reference:**	Well STEAMBOAT 1N - Slot STEAMBOAT 1N
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 1N	**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	14,901.13	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	6,400.00	6,593.17	5,389.05	5,341.19	112.596	CC, ES
CHEYENNE 1N - ORIGINAL WELLBORE - PROPOSAL	11,700.00	6,850.00	9,989.80	9,837.46	65.575	SF
CHEYENNE 2N - ORIGINAL WELLBORE - PROPOSAL	6,521.15	6,641.72	5,713.74	5,671.20	134.323	CC
CHEYENNE 2N - ORIGINAL WELLBORE - PROPOSAL	6,554.74	6,650.30	5,713.79	5,671.17	134.068	ES
CHEYENNE 2N - ORIGINAL WELLBORE - PROPOSAL	11,300.00	6,850.00	9,930.56	9,792.59	71.974	SF
CHEYENNE 3N - ORIGINAL WELLBORE - PROPOSAL	6,404.05	6,479.03	6,028.61	5,991.38	161.922	CC
CHEYENNE 3N - ORIGINAL WELLBORE - PROPOSAL	6,500.00	6,527.59	6,028.87	5,991.37	160.784	ES
CHEYENNE 3N - ORIGINAL WELLBORE - PROPOSAL	11,000.00	6,730.96	9,967.84	9,843.64	80.257	SF
CHEYENNE 4N - ORIGINAL WELLBORE - PROPOSAL	6,532.41	6,586.75	6,335.93	6,302.19	187.780	CC
CHEYENNE 4N - ORIGINAL WELLBORE - PROPOSAL	6,600.00	6,599.08	6,337.54	6,299.72	167.597	ES
CHEYENNE 4N - ORIGINAL WELLBORE - PROPOSAL	10,700.00	6,800.00	9,983.79	9,869.00	86.976	SF
CHEYENNE 5N - ORIGINAL WELLBORE - PROPOSAL	6,401.23	6,447.77	6,632.97	6,602.42	217.105	CC
CHEYENNE 5N - ORIGINAL WELLBORE - PROPOSAL	6,600.00	6,526.90	6,635.83	6,597.40	172.681	ES
CHEYENNE 5N - ORIGINAL WELLBORE - PROPOSAL	10,300.00	6,700.00	9,902.29	9,801.20	97.960	SF
CHEYENNE 6N - ORIGINAL WELLBORE - PROPOSAL	6,521.15	6,569.90	6,931.23	6,901.18	230.601	CC
CHEYENNE 6N - ORIGINAL WELLBORE - PROPOSAL	6,600.00	6,600.00	6,932.87	6,893.32	175.295	ES
CHEYENNE 6N - ORIGINAL WELLBORE - PROPOSAL	10,000.00	6,778.84	9,907.00	9,812.18	104.484	SF
CHEYENNE 7N - ORIGINAL WELLBORE - PROPOSAL	300.00	315.00	6,964.56	6,963.46	6,297.933	CC
CHEYENNE 7N - ORIGINAL WELLBORE - PROPOSAL	400.00	400.00	6,964.73	6,963.21	4,579.328	ES
CHEYENNE 7N - ORIGINAL WELLBORE - PROPOSAL	9,700.00	6,721.85	9,971.29	9,882.80	112.687	SF
CHEYENNE 8N - ORIGINAL WELLBORE - PROPOSAL	260.78	275.78	6,978.89	6,977.96	7,507.716	CC
CHEYENNE 8N - ORIGINAL WELLBORE - PROPOSAL	300.00	300.00	6,978.90	6,977.83	6,509.356	ES
CHEYENNE 8N - ORIGINAL WELLBORE - PROPOSAL	9,300.00	6,850.00	9,946.47	9,862.73	118.785	SF
EXIST DD LORENZ #39-35 - Wellbore #1 - Wellbore #1	1,697.18	1,607.64	7,347.23	7,338.29	821.131	CC
EXIST DD LORENZ #39-35 - Wellbore #1 - Wellbore #1	1,800.00	1,661.00	7,347.65	7,338.13	771.866	ES
EXIST DD LORENZ #39-35 - Wellbore #1 - Wellbore #1	9,400.00	7,356.40	9,968.16	9,884.09	118.561	SF
EXIST DD MILE HIGH #30-2 - Wellbore #1 - Wellbore #1	5,708.10	5,721.19	3,319.58	3,289.81	111.518	CC
EXIST DD MILE HIGH #30-2 - Wellbore #1 - Wellbore #1	6,554.74	6,578.25	3,319.84	3,287.09	101.355	ES
EXIST DD MILE HIGH #30-2 - Wellbore #1 - Wellbore #1	14,300.00	7,546.00	9,937.37	9,718.31	45.365	SF
EXIST VERT HSR-BACANSKAS #13-35 - Wellbore #1 -	157.87	155.84	3,439.99	3,439.62	9,117.279	CC
EXIST VERT HSR-BACANSKAS #13-35 - Wellbore #1 -	5,900.00	5,837.31	3,445.72	3,430.61	228.111	ES
EXIST VERT HSR-BACANSKAS #13-35 - Wellbore #1 -	13,800.00	7,200.00	9,988.51	9,797.85	52.388	SF
EXIST VERT HSR-BANCROFT #15-35 - Wellbore #1 - W	6,442.53	6,367.67	5,962.07	5,945.81	366.666	CC
EXIST VERT HSR-BANCROFT #15-35 - Wellbore #1 - W	6,600.00	6,500.00	5,963.89	5,944.00	299.858	ES
EXIST VERT HSR-BANCROFT #15-35 - Wellbore #1 - W	11,100.00	7,083.32	9,996.17	9,881.25	86.982	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 1N - Slot STEAMBOAT 1N
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 1N	**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 #14-35 - Wellbore #1 - Wellbore #	6,563.25	6,547.56	4,739.30	4,719.59	240.420	CC, ES
EXIST VERT LORENZ #14-35 - Wellbore #1 - Wellbore #	12,400.00	7,150.00	9,982.63	9,831.31	65.971	SF
EXIST VERT LORENZ #16-35 - Wellbore #1 - Wellbore #	6,562.34	6,587.64	7,203.47	7,183.55	361.546	CC, ES
EXIST VERT LORENZ #16-35 - Wellbore #1 - Wellbore #	9,800.00	7,288.78	9,969.41	9,890.01	125.559	SF

Company:	PDC ENERGY	**Local Co-ordinate Reference:**	Well STEAMBOAT 1N - Slot STEAMBOAT 1N
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 1N	**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	7,405.35	7,146.67	1,759.25	1,725.36	51.918	CC
ABDN DD PIERSON #21-34 - Wellbore #1 - Wellbore #1	7,450.00	7,161.00	1,759.76	1,725.23	50.976	ES
ABDN DD PIERSON #21-34 - Wellbore #1 - Wellbore #1	10,600.00	7,208.33	3,642.24	3,527.26	31.677	SF
ABDN DD PIERSON #27-34 - Wellbore #1 - Wellbore #1	3,204.20	2,676.78	2,600.83	2,582.74	143.758	CC, ES
ABDN DD PIERSON #27-34 - Wellbore #1 - Wellbore #1	14,901.13	7,425.14	9,433.21	9,185.44	38.072	SF
ABDN DD PIERSON #28-34 - Wellbore #1 - Wellbore #1	1,883.67	1,250.37	2,677.44	2,672.02	493.656	CC
ABDN DD PIERSON #28-34 - Wellbore #1 - Wellbore #1	1,900.00	1,259.09	2,677.47	2,671.99	489.062	ES
ABDN DD PIERSON #28-34 - Wellbore #1 - Wellbore #1	14,901.13	7,237.07	8,141.07	7,919.19	36.691	SF
ABDN VERT AGRI PROD INC FED #32-7F - Wellbore #	14,901.13	7,084.76	2,685.35	2,464.09	12.137	CC, ES, SF
ABDN VERT AGRI PROD INC FED #32-8F - Wellbore #	14,901.13	7,126.99	1,389.31	1,168.05	6.279	CC, ES, SF
ABDN VERT BECKER #1 - Wellbore #1 - Design #1	8,894.06	7,156.00	1,329.27	1,134.80	6.835	CC
ABDN VERT BECKER #1 - Wellbore #1 - Design #1	8,900.00	7,156.00	1,329.28	1,134.65	6.830	ES
ABDN VERT BECKER #1 - Wellbore #1 - Design #1	9,100.00	7,156.00	1,345.13	1,145.14	6.726	SF
ABDN VERT DEROO WILFRED #1 - Wellbore #1 - Well	14,901.13	7,120.13	1,914.62	1,693.26	8.649	CC, ES, SF
ABDN VERT FRANK #21-32 - Wellbore #1 - Wellbore #1	14,901.13	7,114.49	4,031.24	3,809.84	18.208	CC, ES, SF
ABDN VERT HEITMAN K #34-4 - Wellbore #1 - Wellbore	9,443.79	7,119.26	2,435.46	2,365.78	34.954	CC
ABDN VERT HEITMAN K #34-4 - Wellbore #1 - Wellbore	9,500.00	7,118.98	2,436.11	2,364.90	34.211	ES
ABDN VERT HEITMAN K #34-4 - Wellbore #1 - Wellbore	11,800.00	7,107.55	3,388.62	3,253.76	25.127	SF
ABDN VERT HSR-SPILMAN #9-35 - Wellbore #1 - Wellb	6,251.55	6,149.26	6,881.20	6,865.50	438.267	CC
ABDN VERT HSR-SPILMAN #9-35 - Wellbore #1 - Wellb	6,600.00	6,460.35	6,884.61	6,865.13	353.413	ES
ABDN VERT HSR-SPILMAN #9-35 - Wellbore #1 - Wellb	10,000.00	7,127.82	9,920.34	9,836.78	118.711	SF
ABDN VERT JOHNSON UPRR #31-35 - Wellbore #1 - W	6,290.47	6,167.01	5,914.09	5,897.24	351.113	CC
ABDN VERT JOHNSON UPRR #31-35 - Wellbore #1 - W	6,300.00	6,172.74	5,914.09	5,897.23	350.706	ES
ABDN VERT JOHNSON UPRR #31-35 - Wellbore #1 - W	11,200.00	6,900.00	9,958.41	9,840.82	84.685	SF
ABDN VERT RAYMOND MARTIN GU #1 - Wellbore #1 -	6,554.74	6,420.66	1,444.10	1,424.96	75.468	ES
ABDN VERT RAYMOND MARTIN GU #1 - Wellbore #1 -	6,562.14	6,428.40	1,444.08	1,427.51	87.123	CC
ABDN VERT RAYMOND MARTIN GU #1 - Wellbore #1 -	14,901.13	7,175.07	8,698.09	8,476.83	39.311	SF
ABDN VERT SWEET VALLEY FARMS-UPRR #41-33 - W	10,589.87	7,124.00	2,314.34	2,072.81	9.582	CC
ABDN VERT SWEET VALLEY FARMS-UPRR #41-33 - W	10,700.00	7,124.00	2,316.96	2,072.38	9.473	ES
ABDN VERT SWEET VALLEY FARMS-UPRR #41-33 - W	11,200.00	7,124.00	2,393.41	2,134.94	9.260	SF
ABDN VERT TANNER K FED #33-12 - Wellbore #1 - We	14,716.61	7,117.58	196.79	-19.46	0.910	Level 1, CC, ES, SF
ABDN VERT UPRR 21 PAN AM K #1 - Wellbore #1 - De	6,554.74	6,451.81	4,356.59	4,214.48	30.657	CC
ABDN VERT UPRR 21 PAN AM K #1 - Wellbore #1 - De	6,600.00	6,497.04	4,358.02	4,212.47	29.942	ES, SF
CHATFIELD 10N - ORIGINAL WELLBORE - PROPOSA	8,544.75	7,420.79	1,985.32	1,918.58	29.747	CC
CHATFIELD 10N - ORIGINAL WELLBORE - PROPOSA	8,700.00	7,300.00	1,986.62	1,917.14	28.593	ES
CHATFIELD 10N - ORIGINAL WELLBORE - PROPOSA	10,500.00	6,650.00	2,465.74	2,352.02	21.682	SF
CHATFIELD 11N - ORIGINAL WELLBORE - PROPOSAL	7,250.00	8,768.93	1,677.23	1,610.97	25.312	ES
CHATFIELD 11N - ORIGINAL WELLBORE - PROPOSAL	8,050.55	8,003.66	1,674.54	1,611.92	26.738	CC
CHATFIELD 11N - ORIGINAL WELLBORE - PROPOSAL	10,100.00	6,766.64	2,008.24	1,904.67	19.390	SF
CHATFIELD 12N - ORIGINAL WELLBORE - PROPOSA	7,150.00	8,802.29	1,366.47	1,299.38	20.369	ES
CHATFIELD 12N - ORIGINAL WELLBORE - PROPOSA	7,192.49	8,770.07	1,366.20	1,299.69	20.541	CC
CHATFIELD 12N - ORIGINAL WELLBORE - PROPOSA	9,700.00	6,850.00	1,563.60	1,471.48	16.974	SF
CHATFIELD 13N - ORIGINAL WELLBORE - PROPOSA	8,542.30	7,603.09	1,052.06	984.87	15.658	CC
CHATFIELD 13N - ORIGINAL WELLBORE - PROPOSA	8,700.00	7,467.14	1,053.64	983.61	15.045	ES
CHATFIELD 13N - ORIGINAL WELLBORE - PROPOSA	9,400.00	7,050.00	1,157.10	1,072.05	13.605	SF
CHATFIELD 14N - ORIGINAL WELLBORE - PROPOSA	7,150.00	8,955.98	736.69	669.33	10.937	ES
CHATFIELD 14N - ORIGINAL WELLBORE - PROPOSA	7,184.61	8,929.87	736.35	669.53	11.020	CC
CHATFIELD 14N - ORIGINAL WELLBORE - PROPOSA	9,000.00	7,289.32	787.38	714.04	10.736	SF
CHATFIELD 15N - ORIGINAL WELLBORE - PROPOSA	7,200.00	9,096.71	451.21	383.84	6.698	SF
CHATFIELD 15N - ORIGINAL WELLBORE - PROPOSA	7,300.00	9,014.24	446.10	380.24	6.774	ES
CHATFIELD 15N - ORIGINAL WELLBORE - PROPOSA	7,327.77	8,990.02	445.90	380.49	6.817	CC

Company:	PDC ENERGY	**Local Co-ordinate Reference:**	Well STEAMBOAT 1N - Slot STEAMBOAT 1N
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 1N	**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	8,561.02	7,431.08	2,640.34	2,572.61	38.980	CC
CHATFIELD 8N - ORIGINAL WELLBORE - PROPOSAL	8,800.00	7,250.00	2,642.88	2,570.41	36.464	ES
CHATFIELD 8N - ORIGINAL WELLBORE - PROPOSAL	11,400.00	6,600.00	3,509.51	3,368.85	24.950	SF
CHATFIELD 9N - ORIGINAL WELLBORE - PROPOSAL	8,602.48	7,450.00	2,294.56	2,226.36	33.644	CC
CHATFIELD 9N - ORIGINAL WELLBORE - PROPOSAL	8,800.00	7,287.47	2,296.18	2,224.07	31.841	ES
CHATFIELD 9N - ORIGINAL WELLBORE - PROPOSAL	11,100.00	6,650.00	3,047.66	2,915.84	23.119	SF
CHATFIELD FEDERAL 1N - ORIGINAL WELLBORE - P	8,754.95	7,407.09	2,690.77	2,618.91	37.440	CC
CHATFIELD FEDERAL 1N - ORIGINAL WELLBORE - P	14,901.13	13,542.29	2,715.14	2,307.32	6.658	ES, SF
CHATFIELD FEDERAL 2N - ORIGINAL WELLBORE - P	8,724.36	7,416.96	2,237.20	2,167.10	31.913	CC
CHATFIELD FEDERAL 2N - ORIGINAL WELLBORE - P	14,901.13	13,584.87	2,261.98	1,853.86	5.542	ES, SF
CHATFIELD FEDERAL 3N - ORIGINAL WELLBORE - P	8,768.90	7,365.34	1,935.04	1,863.40	27.011	CC
CHATFIELD FEDERAL 3N - ORIGINAL WELLBORE - P	14,901.13	13,490.44	1,977.59	1,570.71	4.860	ES, SF
CHATFIELD FEDERAL 4N - ORIGINAL WELLBORE - P	8,742.31	7,456.18	1,638.00	1,567.64	23.282	CC
CHATFIELD FEDERAL 4N - ORIGINAL WELLBORE - P	14,901.13	13,611.61	1,682.88	1,275.36	4.130	ES, SF
CHATFIELD FEDERAL 5N - ORIGINAL WELLBORE - P	8,771.49	7,439.25	1,318.63	1,247.46	18.528	CC
CHATFIELD FEDERAL 5N - ORIGINAL WELLBORE - P	14,901.13	13,564.44	1,365.92	960.87	3.372	ES, SF
CHATFIELD FEDERAL 6N - ORIGINAL WELLBORE - P	8,762.28	7,546.97	999.74	928.13	13.962	CC
CHATFIELD FEDERAL 6N - ORIGINAL WELLBORE - P	14,901.13	13,684.50	1,074.14	667.59	2.642	ES, SF
CHATFIELD FEDERAL 7N - ORIGINAL WELLBORE - P	8,783.23	7,588.35	648.46	577.89	9.189	CC
CHATFIELD FEDERAL 7N - ORIGINAL WELLBORE - P	14,901.13	13,703.65	672.06	276.70	1.700	ES, SF
EXIST DD HUNT K FEDERAL #33-19 - Wellbore #1 - W	13,932.71	7,240.62	1,671.44	1,474.69	8.495	CC
EXIST DD HUNT K FEDERAL #33-19 - Wellbore #1 - W	14,000.00	7,239.30	1,672.79	1,474.16	8.421	ES
EXIST DD HUNT K FEDERAL #33-19 - Wellbore #1 - W	14,300.00	7,233.45	1,711.30	1,504.26	8.265	SF
EXIST DD PIERSON #18-34 - Wellbore #1 - Wellbore #1	8,635.59	7,375.19	1,664.98	1,589.40	22.029	CC
EXIST DD PIERSON #18-34 - Wellbore #1 - Wellbore #1	8,700.00	7,374.74	1,666.22	1,588.95	21.564	ES
EXIST DD PIERSON #18-34 - Wellbore #1 - Wellbore #1	9,600.00	7,368.47	1,924.10	1,822.59	18.955	SF
EXIST DD PIERSON #22-34 - Wellbore #1 - Wellbore #1	8,602.57	7,644.11	416.81	340.54	5.465	CC, ES
EXIST DD PIERSON #22-34 - Wellbore #1 - Wellbore #1	8,700.00	7,643.20	428.05	349.23	5.431	SF
EXIST DD PIERSON #29-34 - Wellbore #1 - Wellbore #1	2,831.89	2,301.69	2,721.43	2,704.51	160.802	CC, ES
EXIST DD PIERSON #29-34 - Wellbore #1 - Wellbore #1	11,600.00	7,404.25	4,063.29	3,904.73	25.627	SF
EXIST HZ PEAKS #K26-77-1HN - Wellbore #1 - Wellbor	3,156.70	2,412.00	4,153.43	4,139.36	295.181	CC, ES
EXIST HZ PEAKS #K26-77-1HN - Wellbore #1 - Wellbor	12,600.00	5,918.00	9,930.14	9,773.69	63.471	SF
EXIST HZ PEAKS #K26-78-1HN - Wellbore #1 - Wellbor	3,268.24	2,639.30	4,154.02	4,138.19	262.432	CC
EXIST HZ PEAKS #K26-78-1HN - Wellbore #1 - Wellbor	3,300.00	2,669.85	4,154.16	4,138.15	259.398	ES
EXIST HZ PEAKS #K26-78-1HN - Wellbore #1 - Wellbor	13,100.00	6,672.00	9,920.97	9,739.58	54.693	SF
EXIST HZ PEPPLER #K26-79-1HN - Wellbore #1 - Wellb	3,860.87	3,776.61	3,952.61	3,933.34	205.083	CC
EXIST HZ PEPPLER #K26-79-1HN - Wellbore #1 - Wellb	3,900.00	3,800.83	3,952.69	3,933.29	203.782	ES
EXIST HZ PEPPLER #K26-79-1HN - Wellbore #1 - Wellb	13,800.00	6,961.00	9,983.16	9,776.38	48.280	SF
EXIST HZ TANNER FED #K33-65HN - Wellbore #1 - We	12,617.59	9,451.33	343.83	123.54	1.561	CC, ES, SF
EXIST HZ TARIN FED #32W-234 - Wellbore #1 - Wellbo	14,901.13	6,947.97	744.67	676.53	10.929	CC, ES, SF
EXIST HZ WIEDMAN #29O-243 - Wellbore #1 - Wellbore	14,901.13	11,542.00	3,371.42	3,126.80	13.782	CC, ES, SF
EXIST VERT AGRI PROD FED #32-17 - Wellbore #1 - D	14,901.13	7,121.00	2,264.61	1,902.74	6.258	CC, ES, SF
EXIST VERT AGRI PROD INC #32-1F - Wellbore #1 - D	14,901.13	7,124.00	2,476.68	2,114.77	6.843	CC, ES, SF
EXIST VERT AGRI PROD INC #32-2F - Wellbore #1 - D	14,901.13	7,132.00	3,296.04	2,934.05	9.105	CC, ES, SF
EXIST VERT BERIG #17-35 - Wellbore #1 - Design #1	6,554.74	6,445.81	6,496.41	6,353.67	45.514	CC
EXIST VERT BERIG #17-35 - Wellbore #1 - Design #1	6,600.00	6,491.04	6,497.78	6,352.90	44.849	ES
EXIST VERT BERIG #17-35 - Wellbore #1 - Design #1	10,500.00	7,162.00	9,936.96	9,698.54	41.679	SF
EXIST VERT BIERIG UPRR #41-35 #2 - Wellbore #1 - W	6,560.01	6,487.20	7,344.16	7,325.37	390.740	CC, ES
EXIST VERT BIERIG UPRR #41-35 #2 - Wellbore #1 - W	9,700.00	7,200.00	9,980.28	9,903.81	130.511	SF
EXIST VERT BIERIG-UPRR #42-35 - Wellbore #1 - Well	6,561.17	6,508.62	6,840.34	6,821.12	355.940	CC, ES
EXIST VERT BIERIG-UPRR #42-35 - Wellbore #1 - Well	10,100.00	7,121.66	9,951.32	9,863.81	113.717	SF

Company:	PDC ENERGY	**Local Co-ordinate Reference:**	Well STEAMBOAT 1N - Slot STEAMBOAT 1N
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 1N	**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	11,812.69	7,144.00	1,686.34	1,410.61	6.116	CC
EXIST VERT BRUZEWSKI #33-15F - Wellbore #1 - Des	11,900.00	7,144.00	1,688.60	1,410.43	6.070	ES
EXIST VERT BRUZEWSKI #33-15F - Wellbore #1 - Des	12,100.00	7,144.00	1,710.64	1,426.89	6.029	SF
EXIST VERT BRUZEWSKI #33-15F (2) - Wellbore #1 - W	12,022.72	7,159.16	1,484.80	1,343.87	10.536	CC
EXIST VERT BRUZEWSKI #33-15F (2) - Wellbore #1 - W	12,100.00	7,159.22	1,486.81	1,343.73	10.391	ES
EXIST VERT BRUZEWSKI #33-15F (2) - Wellbore #1 - W	12,500.00	7,159.54	1,559.63	1,405.38	10.111	SF
EXIST VERT BRUZEWSKI #33-16F - Wellbore #1 - Wel	10,577.06	7,136.75	1,524.23	1,423.42	15.120	CC
EXIST VERT BRUZEWSKI #33-16F - Wellbore #1 - Wel	10,600.00	7,136.51	1,524.40	1,422.96	15.027	ES
EXIST VERT BRUZEWSKI #33-16F - Wellbore #1 - Wel	11,200.00	7,129.81	1,646.61	1,528.51	13.943	SF
EXIST VERT FRANK #32-24 - Wellbore #1 - Wellbore #1	14,901.13	7,150.00	3,723.11	3,501.73	16.818	CC, ES, SF
EXIST VERT HEITMAN #K34-5 - Wellbore #1 - Design #	9,400.57	7,141.00	975.92	766.93	4.670	CC, ES
EXIST VERT HEITMAN #K34-5 - Wellbore #1 - Design #	9,500.00	7,141.00	980.97	769.28	4.634	SF
EXIST VERT HSR-BURMESTER #7-34 - Wellbore #1 - D	6,554.74	6,437.81	989.39	844.71	6.839	CC, ES, SF
EXIST VERT HSR-CARRICO #3-34 - Wellbore #1 - Desi	8,109.47	7,130.00	2,440.33	2,265.30	13.942	CC
EXIST VERT HSR-CARRICO #3-34 - Wellbore #1 - Desi	8,200.00	7,130.00	2,442.01	2,264.77	13.777	ES
EXIST VERT HSR-CARRICO #3-34 - Wellbore #1 - Desi	9,000.00	7,130.00	2,597.74	2,399.69	13.117	SF
EXIST VERT HSR-COLE #6-34 - Wellbore #1 - Design #	7,962.44	7,159.00	995.05	824.20	5.824	CC
EXIST VERT HSR-COLE #6-34 - Wellbore #1 - Design #	8,000.00	7,159.00	995.76	824.05	5.799	ES
EXIST VERT HSR-COLE #6-34 - Wellbore #1 - Design #	8,100.00	7,159.00	1,004.52	830.43	5.770	SF
EXIST VERT HSR-DIEFENBACH #10-34 - Wellbore #1 -	2,877.52	2,774.93	251.40	187.20	3.916	CC
EXIST VERT HSR-DIEFENBACH #10-34 - Wellbore #1 -	6,600.00	6,487.04	279.38	134.16	1.924	ES, SF
EXIST VERT HSR-ENGSTROM #15-34 - Wellbore #1 - W	100.00	54.81	948.46	948.37	10,000.000	CC
EXIST VERT HSR-ENGSTROM #15-34 - Wellbore #1 - W	300.00	254.00	948.99	948.31	1,400.641	ES
EXIST VERT HSR-ENGSTROM #15-34 - Wellbore #1 - W	14,901.13	7,200.00	8,274.90	8,053.54	37.381	SF
EXIST VERT HSR-FRAHM #9-34 - Wellbore #1 - Design	2,988.29	2,896.28	1,788.79	1,721.80	26.699	CC
EXIST VERT HSR-FRAHM #9-34 - Wellbore #1 - Design	6,600.00	6,500.04	1,792.75	1,647.02	12.302	ES, SF
EXIST VERT HSR-FRENCH #16-34 - Wellbore #1 - Wel	100.00	62.44	1,575.43	1,575.34	10,000.000	CC
EXIST VERT HSR-FRENCH #16-34 - Wellbore #1 - Wel	300.00	259.37	1,575.64	1,574.94	2,247.308	ES
EXIST VERT HSR-FRENCH #16-34 - Wellbore #1 - Wel	14,901.13	7,259.26	9,194.63	8,973.35	41.551	SF
EXIST VERT HSR-SCHMID #2-34 - Wellbore #1 - Desig	6,554.74	6,422.81	2,336.73	2,191.06	16.041	CC, ES
EXIST VERT HSR-SCHMID #2-34 - Wellbore #1 - Desig	7,600.00	7,134.57	2,507.32	2,343.58	15.313	SF
EXIST VERT HSR-THOMAS #10-35 - Wellbore #1 - Wel	6,558.53	6,500.00	5,716.90	5,697.14	289.380	CC, ES
EXIST VERT HSR-THOMAS #10-35 - Wellbore #1 - Wel	11,200.00	7,100.00	9,956.17	9,843.25	88.174	SF
EXIST VERT HSR-TRAIN #12-35 - Wellbore #1 - Wellbo	5,179.55	5,110.49	3,110.26	3,096.98	234.177	CC
EXIST VERT HSR-TRAIN #12-35 - Wellbore #1 - Wellbo	6,600.00	6,470.83	3,115.53	3,096.08	160.179	ES
EXIST VERT HSR-TRAIN #12-35 - Wellbore #1 - Wellbo	13,800.00	7,024.64	9,933.53	9,752.58	54.896	SF
EXIST VERT JOHNSON #32-35 - Wellbore #1 - Design #	6,554.74	6,448.81	5,822.18	5,679.64	40.844	CC
EXIST VERT JOHNSON #32-35 - Wellbore #1 - Design #	6,600.00	6,494.04	5,823.58	5,678.48	40.134	ES
EXIST VERT JOHNSON #32-35 - Wellbore #1 - Design #	11,100.00	7,165.00	9,907.56	9,652.47	38.839	SF
EXIST VERT MARGHEIM #24-35 - Wellbore #1 - Design	6,554.74	6,465.81	6,320.73	6,178.35	44.395	CC
EXIST VERT MARGHEIM #24-35 - Wellbore #1 - Design	6,600.00	6,511.04	6,322.16	6,176.58	43.430	ES
EXIST VERT MARGHEIM #24-35 - Wellbore #1 - Design	10,600.00	7,182.00	9,954.60	9,713.22	41.240	SF
EXIST VERT SANDAU #24-34 - Wellbore #1 - Wellbore	304.27	253.24	1,541.60	1,540.92	2,267.256	CC, ES
EXIST VERT SANDAU #24-34 - Wellbore #1 - Wellbore	10,300.00	7,149.74	2,613.99	2,521.06	28.129	SF
EXIST VERT SANDAU #34-11F - Wellbore #1 - Wellbore	8,196.20	6,540.14	702.60	678.05	28.619	CC
EXIST VERT SANDAU #34-11F - Wellbore #1 - Wellbore	8,200.00	6,540.14	702.61	678.01	28.564	ES
EXIST VERT SANDAU #34-11F - Wellbore #1 - Wellbore	8,500.00	6,540.14	765.47	736.93	26.820	SF
EXIST VERT SANDAU #34-12F - Wellbore #1 - Wellbore	9,519.60	7,150.00	215.46	144.09	3.019	CC, ES, SF
EXIST VERT SARATOGA #1 - Wellbore #1 - Design #1	14,308.36	7,140.00	1,307.13	961.67	3.784	CC, ES
EXIST VERT SARATOGA #1 - Wellbore #1 - Design #1	14,400.00	7,140.00	1,310.34	962.31	3.765	SF
EXIST VERT SHUTT #20-34 - Wellbore #1 - Wellbore #1	1,334.52	1,291.13	1,070.70	1,065.95	225.534	CC

Company:	PDC ENERGY	**Local Co-ordinate Reference:**	Well STEAMBOAT 1N - Slot STEAMBOAT 1N
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 1N	**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 #20-34 - Wellbore #1 - Wellbore #1	1,500.00	1,452.22	1,071.05	1,065.53	193.871	ES
EXIST VERT SHUTT #20-34 - Wellbore #1 - Wellbore #1	14,901.13	7,200.00	8,812.84	8,591.54	39.823	SF
EXIST VERT SHUTT #24-34 - Wellbore #1 - Design #1	6,554.74	6,445.81	1,059.80	917.37	7.441	CC
EXIST VERT SHUTT #24-34 - Wellbore #1 - Design #1	6,600.00	6,491.04	1,061.21	916.07	7.311	ES, SF
EXIST VERT SWEET VALLEY FARMS #31-33 2 - Wellb	12,085.35	7,119.00	2,413.64	2,130.56	8.526	CC
EXIST VERT SWEET VALLEY FARMS #31-33 2 - Wellb	12,200.00	7,119.00	2,416.36	2,130.08	8.440	ES
EXIST VERT SWEET VALLEY FARMS #31-33 2 - Wellb	12,700.00	7,119.00	2,490.67	2,190.42	8.295	SF
EXIST VERT TANNER K #33-11 - Wellbore #1 - Wellbore	13,268.30	7,133.10	96.27	-79.44	0.548	Level 1, CC, ES, SF
EXIST VERT TANNER K #33-14 - Wellbore #1 - Wellbor	13,154.60	7,167.23	1,823.92	1,651.39	10.572	CC
EXIST VERT TANNER K #33-14 - Wellbore #1 - Wellbor	13,200.00	7,167.21	1,824.48	1,650.69	10.498	ES
EXIST VERT TANNER K #33-14 - Wellbore #1 - Wellbor	13,700.00	7,166.97	1,903.72	1,715.94	10.138	SF
EXIST VERT UPRC #33-7F - Wellbore #1 - Wellbore #1	11,806.64	7,082.39	899.64	764.54	6.659	CC, ES
EXIST VERT UPRC #33-7F - Wellbore #1 - Wellbore #1	12,000.00	7,086.36	920.17	779.67	6.549	SF
EXIST VERT UPRC #33-8F - Wellbore #1 - Wellbore #1	10,606.23	7,100.00	828.31	726.76	8.157	CC, ES
EXIST VERT UPRC #33-8F - Wellbore #1 - Wellbore #1	10,800.00	7,100.00	850.68	743.76	7.956	SF
EXIST VERT UPRC #35-3F - Wellbore #1 - Wellbore #1	6,554.74	6,431.54	4,802.12	4,784.22	268.266	ES
EXIST VERT UPRC #35-3F - Wellbore #1 - Wellbore #1	6,555.71	6,432.56	4,802.12	4,784.24	268.558	CC
EXIST VERT UPRC #35-3F - Wellbore #1 - Wellbore #1	12,500.00	6,900.00	9,960.01	9,806.26	64.780	SF
EXIST VERT UPRC #35-4F - Wellbore #1 - Wellbore #1	6,554.74	6,522.01	3,756.03	3,737.83	206.419	ES
EXIST VERT UPRC #35-4F - Wellbore #1 - Wellbore #1	6,580.45	6,546.44	3,755.66	3,738.15	214.537	CC
EXIST VERT UPRC #35-4F - Wellbore #1 - Wellbore #1	13,700.00	7,290.00	9,938.61	9,751.38	53.083	SF
EXIST VERT UPRC #35-5F - Wellbore #1 - Wellbore #1	5,843.47	5,727.10	3,056.51	3,041.01	197.119	CC
EXIST VERT UPRC #35-5F - Wellbore #1 - Wellbore #1	6,559.60	6,463.19	3,059.28	3,040.72	164.799	ES
EXIST VERT UPRC #35-5F - Wellbore #1 - Wellbore #1	14,000.00	7,250.00	9,989.60	9,794.61	51.232	SF
EXIST VERT UPRC #35-6F - Wellbore #1 - Wellbore #1	6,570.39	6,534.67	4,146.26	4,127.08	216.181	CC, ES
EXIST VERT UPRC #35-6F - Wellbore #1 - Wellbore #1	12,800.00	7,054.76	9,908.95	9,746.80	61.109	SF
EXIST VERT UPRC FEDERAL #33-3F - Wellbore #1 - W	13,038.26	7,083.03	2,280.60	2,111.06	13.452	CC
EXIST VERT UPRC FEDERAL #33-3F - Wellbore #1 - W	13,100.00	7,082.52	2,281.44	2,110.17	13.321	ES
EXIST VERT UPRC FEDERAL #33-3F - Wellbore #1 - W	13,900.00	7,076.00	2,437.96	2,244.32	12.590	SF
EXIST VERT UPRC FEDERAL #33-4F - Wellbore #1 - D	14,467.64	7,121.00	2,118.62	1,768.89	6.058	CC
EXIST VERT UPRC FEDERAL #33-4F - Wellbore #1 - D	14,500.00	7,121.00	2,118.87	1,768.23	6.043	ES
EXIST VERT UPRC FEDERAL #33-4F - Wellbore #1 - D	14,800.00	7,121.00	2,144.53	1,785.49	5.973	SF
EXIST VERT UPRC FEDERAL #33-5K - Wellbore #1 - W	14,864.60	7,126.49	1,298.42	1,077.69	5.882	CC
EXIST VERT UPRC FEDERAL #33-5K - Wellbore #1 - W	14,901.13	7,126.41	1,298.94	1,077.18	5.857	ES, SF
EXIST VERT UPRC FEDERAL #33-6F - Wellbore #1 - W	13,353.20	7,108.01	1,166.15	988.08	6.549	CC
EXIST VERT UPRC FEDERAL #33-6F - Wellbore #1 - W	13,400.00	7,105.57	1,167.09	987.70	6.506	ES
EXIST VERT UPRC FEDERAL #33-6F - Wellbore #1 - W	13,600.00	7,094.70	1,191.91	1,006.93	6.444	SF
EXIST VERT UPRC K #35-19 - Wellbore #1 - Wellbore #	6,564.93	6,488.40	4,064.92	4,046.68	222.929	CC, ES
EXIST VERT UPRC K #35-19 - Wellbore #1 - Wellbore #	13,100.00	6,700.00	9,994.65	9,827.96	59.960	SF
EXIST VERT WEBER K #33-10 - Wellbore #1 - Design #	11,970.29	7,140.00	456.29	176.21	1.629	CC, ES
EXIST VERT WEBER K #33-10 - Wellbore #1 - Design #	12,000.00	7,140.00	457.26	176.34	1.628	SF
EXIST VERT WEBER K #33-9 - Wellbore #1 - Design #1	10,825.63	7,148.00	475.70	227.39	1.916	CC, ES, SF
EXIST VERT WILLIAMS #41-34-1 - Wellbore #1 - Design	6,554.74	6,422.81	2,878.75	2,733.40	19.806	CC, ES, SF
EXIST VERT WILLIAMS #42-34 - Wellbore #1 - Design #	6,554.74	6,436.81	2,127.56	1,984.06	14.826	CC, ES
EXIST VERT WILLIAMS #42-34 - Wellbore #1 - Design #	6,650.00	6,531.79	2,132.85	1,988.47	14.772	SF

Company:	PDC ENERGY	**Local Co-ordinate Reference:**	Well STEAMBOAT 1N - Slot STEAMBOAT 1N
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 1N	**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	6,408.88	6,657.55	3,123.74	3,072.06	60.444	CC, ES
EL DORADO 1N - ORIGINAL WELLBORE - PROPOSAL	14,200.00	6,900.00	9,938.37	9,716.32	44.757	SF
EL DORADO 2N - ORIGINAL WELLBORE - PROPOSAL	6,526.96	6,690.66	3,406.70	3,360.08	73.062	CC
EL DORADO 2N - ORIGINAL WELLBORE - PROPOSAL	6,554.74	6,700.00	3,406.75	3,360.06	72.959	ES
EL DORADO 2N - ORIGINAL WELLBORE - PROPOSAL	13,900.00	6,900.00	9,977.02	9,766.05	47.292	SF
EL DORADO 3N - ORIGINAL WELLBORE - PROPOSAL	6,416.56	6,523.14	3,695.96	3,654.73	89.637	CC, ES
EL DORADO 3N - ORIGINAL WELLBORE - PROPOSAL	13,500.00	6,750.00	9,924.35	9,731.74	51.525	SF
EL DORADO 4N - ORIGINAL WELLBORE - PROPOSAL	6,525.99	6,595.39	3,984.32	3,947.22	107.407	CC
EL DORADO 4N - ORIGINAL WELLBORE - PROPOSAL	6,554.74	6,604.14	3,984.37	3,947.20	107.198	ES
EL DORADO 4N - ORIGINAL WELLBORE - PROPOSAL	13,200.00	6,800.00	9,948.11	9,764.87	54.291	SF
EL DORADO 5N - ORIGINAL WELLBORE - PROPOSAL	6,416.22	6,473.65	4,233.60	4,200.21	126.789	CC, ES
EL DORADO 5N - ORIGINAL WELLBORE - PROPOSAL	12,900.00	6,718.94	9,934.44	9,763.34	58.065	SF
EL DORADO 6N - ORIGINAL WELLBORE - PROPOSAL	6,525.99	6,578.75	4,545.64	4,514.66	146.733	CC
EL DORADO 6N - ORIGINAL WELLBORE - PROPOSAL	6,600.00	6,600.00	4,547.29	4,509.12	119.130	ES
EL DORADO 6N - ORIGINAL WELLBORE - PROPOSAL	12,600.00	6,800.00	9,972.79	9,808.42	60.674	SF
EL DORADO 7N - ORIGINAL WELLBORE - PROPOSAL	300.00	324.00	4,766.25	4,765.12	4,232.611	CC
EL DORADO 7N - ORIGINAL WELLBORE - PROPOSAL	6,600.00	6,550.00	4,792.14	4,752.74	121.610	ES
EL DORADO 7N - ORIGINAL WELLBORE - PROPOSAL	12,300.00	6,719.02	9,944.65	9,789.50	64.097	SF
EL DORADO 8N - ORIGINAL WELLBORE - PROPOSAL	256.14	280.14	4,779.53	4,778.60	5,145.274	CC
EL DORADO 8N - ORIGINAL WELLBORE - PROPOSAL	300.00	318.91	4,779.55	4,778.43	4,289.547	ES
EL DORADO 8N - ORIGINAL WELLBORE - PROPOSAL	12,000.00	6,800.00	9,987.86	9,836.18	65.846	SF
NW NE SEC. 3 T3N R66W 6th P.M. (TRIPPETT)						
TRIPPETT 1N - ORIGINAL WELLBORE - PROPOSAL #	6,525.98	6,548.46	1,887.13	1,846.28	46.194	CC, ES
TRIPPETT 1N - ORIGINAL WELLBORE - PROPOSAL #	13,900.00	6,750.00	7,087.58	6,888.41	35.585	SF
TRIPPETT 2N - ORIGINAL WELLBORE - PROPOSAL #	6,425.47	6,456.37	1,889.22	1,849.11	47.108	CC, ES
TRIPPETT 2N - ORIGINAL WELLBORE - PROPOSAL #	14,901.13	6,700.00	8,349.19	8,124.14	37.098	SF
TRIPPETT 3N - ORIGINAL WELLBORE - PROPOSAL #	6,525.98	6,582.51	1,949.79	1,911.35	50.723	CC, ES
TRIPPETT 3N - ORIGINAL WELLBORE - PROPOSAL #	14,901.13	6,800.00	8,679.71	8,449.36	37.680	SF
TRIPPETT 4N - ORIGINAL WELLBORE - PROPOSAL #	6,432.10	6,530.20	2,044.70	2,008.86	57.049	CC
TRIPPETT 4N - ORIGINAL WELLBORE - PROPOSAL #	6,600.00	6,600.00	2,049.71	2,006.66	47.610	ES
TRIPPETT 4N - ORIGINAL WELLBORE - PROPOSAL #	14,901.13	6,750.00	8,967.88	8,737.28	38.890	SF
TRIPPETT 5N - ORIGINAL WELLBORE - PROPOSAL #	6,525.98	6,673.62	2,176.91	2,142.53	63.314	CC
TRIPPETT 5N - ORIGINAL WELLBORE - PROPOSAL #	6,600.00	6,700.00	2,178.34	2,129.80	44.873	ES
TRIPPETT 5N - ORIGINAL WELLBORE - PROPOSAL #	14,901.13	6,900.00	9,249.89	9,011.78	38.848	SF
TRIPPETT 6N - ORIGINAL WELLBORE - PROPOSAL #	300.00	277.00	2,325.17	2,324.15	2,278.602	CC
TRIPPETT 6N - ORIGINAL WELLBORE - PROPOSAL #	6,600.00	6,700.00	2,340.68	2,287.33	43.877	ES
TRIPPETT 6N - ORIGINAL WELLBORE - PROPOSAL #	14,901.13	6,900.00	9,538.54	9,298.25	39.696	SF
TRIPPETT 7N - ORIGINAL WELLBORE - PROPOSAL #	300.00	277.00	2,325.69	2,324.67	2,279.112	CC, ES
TRIPPETT 7N - ORIGINAL WELLBORE - PROPOSAL #	13,500.00	7,068.82	8,570.70	8,359.16	40.517	SF
TRIPPETT 8N - ORIGINAL WELLBORE - PROPOSAL #	300.00	277.00	2,326.31	2,325.29	2,279.722	CC, ES
TRIPPETT 8N - ORIGINAL WELLBORE - PROPOSAL #	12,700.00	7,100.00	8,100.95	7,907.40	41.854	SF
TRIPPETT 9N - ORIGINAL WELLBORE - PROPOSAL #	300.00	277.00	2,327.19	2,326.17	2,280.582	CC
TRIPPETT 9N - ORIGINAL WELLBORE - PROPOSAL #	14,901.13	14,951.66	2,520.53	2,079.19	5.711	ES, SF

Company:	PDC ENERGY	**Local Co-ordinate Reference:**	Well STEAMBOAT 1N - Slot STEAMBOAT 1N
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 1N	**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 #	6,431.01	6,353.31	6,743.44	6,727.27	416.979	CC
ABDN VERT HSR-BOB 16-35 - Wellbore #1 - Wellbore #	6,600.00	6,517.81	6,745.39	6,726.08	349.332	ES
ABDN VERT HSR-BOB 16-35 - Wellbore #1 - Wellbore #	10,200.00	7,200.00	9,941.03	9,850.71	110.069	SF
EXIST HZ LORENZ 23-35 - Wellbore #1 - Wellbore #1	6,557.01	6,484.33	4,926.72	4,906.78	247.144	CC, ES
EXIST HZ LORENZ 23-35 - Wellbore #1 - Wellbore #1	12,000.00	7,231.09	9,914.00	9,773.82	70.721	SF
EXIST VERT CLIFFORD L3-29 - Wellbore #1 - Wellbore	309.87	278.64	2,500.33	2,499.49	2,961.554	CC
EXIST VERT CLIFFORD L3-29 - Wellbore #1 - Wellbore	8,800.00	7,194.08	2,536.40	2,484.24	48.628	ES
EXIST VERT CLIFFORD L3-29 - Wellbore #1 - Wellbore	12,400.00	7,166.39	4,456.03	4,304.62	29.432	SF
EXIST VERT HSR-BIG GEORGE #14-35 - Wellbore #1 -	1,765.78	1,729.48	4,131.76	4,091.90	103.657	CC
EXIST VERT HSR-BIG GEORGE #14-35 - Wellbore #1 -	6,600.00	6,529.04	4,147.95	3,999.92	28.022	ES
EXIST VERT HSR-BIG GEORGE #14-35 - Wellbore #1 -	6,650.00	6,578.79	4,152.59	4,004.39	28.021	SF
STEAMBOAT 10N - ORIGINAL WELLBORE - PROPOSA	300.00	300.00	134.98	133.91	125.901	CC, ES
STEAMBOAT 10N - ORIGINAL WELLBORE - PROPOSA	7,209.79	7,334.65	194.13	158.43	5.438	SF
STEAMBOAT 11N - ORIGINAL WELLBORE - PROPOSA	300.00	300.00	149.96	148.88	139.867	CC, ES
STEAMBOAT 11N - ORIGINAL WELLBORE - PROPOSA	7,350.00	7,300.00	470.23	433.92	12.950	SF
STEAMBOAT 12N - ORIGINAL WELLBORE - PROPOSA	300.00	300.00	164.97	163.89	153.866	CC, ES
STEAMBOAT 12N - ORIGINAL WELLBORE - PROPOSA	7,900.00	6,980.76	982.98	940.76	23.282	SF
STEAMBOAT 13N - ORIGINAL WELLBORE - PROPOSA	300.00	300.00	179.94	178.87	167.832	CC, ES
STEAMBOAT 13N - ORIGINAL WELLBORE - PROPOSA	8,500.00	6,878.53	1,500.27	1,443.17	26.276	SF
STEAMBOAT 14N - ORIGINAL WELLBORE - PROPOSA	300.00	300.00	194.95	193.88	181.831	CC, ES
STEAMBOAT 14N - ORIGINAL WELLBORE - PROPOSA	9,200.00	6,750.00	2,193.68	2,119.04	29.391	SF
STEAMBOAT 15N - ORIGINAL WELLBORE - PROPOSA	300.00	300.00	209.96	208.88	195.831	CC, ES
STEAMBOAT 15N - ORIGINAL WELLBORE - PROPOSA	9,900.00	6,800.00	2,884.68	2,788.90	30.116	SF
STEAMBOAT 16N - ORIGINAL WELLBORE - PROPOSA	300.00	300.00	224.93	223.86	209.796	CC, ES
STEAMBOAT 16N - ORIGINAL WELLBORE - PROPOSA	11,000.00	6,750.00	3,978.55	3,852.85	31.652	SF
STEAMBOAT 2N - ORIGINAL WELLBORE - PROPOSA	300.00	300.00	14.98	13.91	13.973	CC
STEAMBOAT 2N - ORIGINAL WELLBORE - PROPOSA	14,901.13	14,776.64	323.77	-96.59	0.770	Level 1, ES, SF
STEAMBOAT 3N - ORIGINAL WELLBORE - PROPOSA	300.00	300.00	29.99	28.92	27.973	CC, ES
STEAMBOAT 3N - ORIGINAL WELLBORE - PROPOSA	14,901.13	14,853.40	629.16	189.70	1.432	Level 3, SF
STEAMBOAT 4N - ORIGINAL WELLBORE - PROPOSA	300.00	300.00	45.00	43.93	41.972	CC, ES
STEAMBOAT 4N - ORIGINAL WELLBORE - PROPOSA	14,901.13	14,778.04	924.00	487.04	2.115	SF
STEAMBOAT 5N - ORIGINAL WELLBORE - PROPOSA	300.00	300.00	59.97	58.90	55.938	CC, ES
STEAMBOAT 5N - ORIGINAL WELLBORE - PROPOSA	14,901.13	14,904.42	1,249.02	809.83	2.844	SF
STEAMBOAT 6N - ORIGINAL WELLBORE - PROPOSA	300.00	300.00	74.98	73.91	69.937	CC, ES
STEAMBOAT 6N - ORIGINAL WELLBORE - PROPOSA	14,901.13	14,838.94	1,551.90	1,113.51	3.540	SF
STEAMBOAT 7N - ORIGINAL WELLBORE - PROPOSA	300.00	300.00	89.99	88.92	83.937	CC, ES
STEAMBOAT 7N - ORIGINAL WELLBORE - PROPOSA	14,901.13	14,988.55	1,878.93	1,439.68	4.278	SF
STEAMBOAT 8N - ORIGINAL WELLBORE - PROPOSA	300.00	300.00	104.96	103.89	97.902	CC, ES
STEAMBOAT 8N - ORIGINAL WELLBORE - PROPOSA	14,901.13	14,974.88	2,170.95	1,731.88	4.944	SF
STEAMBOAT 9N - ORIGINAL WELLBORE - PROPOSA	7,303.95	7,357.70	81.06	44.75	2.233	CC, ES, SF

Company:	PDC ENERGY	**Local Co-ordinate Reference:**	Well STEAMBOAT 1N - Slot STEAMBOAT 1N
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 1N	**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	14,901.13	7,129.03	1,166.48	945.07	5.268	CC, ES, SF
EXIST VERT FLOYD #5 - Wellbore #1 - Wellbore #1	14,901.13	7,163.74	1,973.97	1,752.57	8.916	CC, ES, SF
EXIST VERT GLEN #44-32 - Wellbore #1 - Wellbore #1	14,901.13	7,148.42	1,793.99	1,572.34	8.094	CC, ES, SF
TARIN FEDERAL 32W-234 - JOB #2015-138-135 - FINA	14,901.13	6,947.22	743.60	675.46	10.912	CC, ES, SF
TARIN FEDERAL 32W-434 - JOB #2015-139-135 - FINA	14,901.13	7,001.00	705.08	509.38	3.603	CC, ES, SF
TARIN FEDERAL 32X-204 - JOB #2015-141-135 - FINAL	14,901.13	6,730.00	1,289.92	1,076.12	6.033	CC, ES, SF
TARIN FEDERAL 32X-314 - JOB #2015-140-135 - FINAL	14,901.13	6,864.44	936.43	735.69	4.665	CC, ES, SF
TARIN FEDERAL 32X-334 - JOB #2015-142-135 - FINAL	14,901.13	6,875.13	1,439.21	1,211.61	6.323	CC, ES, SF
TARIN FEDERAL 32Y-214 - JOB #2015-143-135 - FINAL	14,901.13	6,793.94	1,980.46	1,751.60	8.654	CC, ES, SF
TARIN FEDERAL 32Y-314 - JOB#2015-144-135 - FINAL	14,901.13	6,890.95	2,221.69	1,989.87	9.584	CC, ES, SF
TARIN FEDERAL 32Y-404 - JOB# 2015-145-135 - FINAL	14,901.13	7,006.00	2,363.56	2,129.51	10.098	CC, ES, SF
SW NE SEC. 5 T3N R66W 6th P.M. (NAVAJO)						
EXIST DD BRIGHT L #3-30D - Wellbore #1 - Wellbore #1	10,100.45	7,290.12	2,382.92	2,279.30	22.995	CC
EXIST DD BRIGHT L #3-30D - Wellbore #1 - Wellbore #1	10,200.00	7,289.45	2,385.00	2,278.63	22.421	ES
EXIST DD BRIGHT L #3-30D - Wellbore #1 - Wellbore #1	11,600.00	7,281.14	2,815.49	2,670.29	19.390	SF
EXIST DD WEBBER #29-4 - Wellbore #1 - Wellbore #1	13,988.81	7,301.64	2,387.50	2,171.46	11.051	CC
EXIST DD WEBBER #29-4 - Wellbore #1 - Wellbore #1	14,100.00	7,302.06	2,390.08	2,170.93	10.906	ES
EXIST DD WEBBER #29-4 - Wellbore #1 - Wellbore #1	14,700.00	7,304.32	2,491.17	2,255.21	10.558	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	2,069.07	2,012.85	0.00	9.09	107.47	-1,947.92	6,189.29	6,789.19				
100.00	100.00	2,164.29	2,103.52	0.09	9.70	107.40	-1,931.81	6,165.09	6,759.77	6,753.03	6.74	1,002.488	
200.00	200.00	2,259.52	2,194.20	0.31	10.30	107.33	-1,915.69	6,140.90	6,730.36	6,723.01	7.35	915.753	
300.00	300.00	2,354.74	2,284.88	0.54	10.91	107.25	-1,899.58	6,116.70	6,700.96	6,693.00	7.96	842.046	
400.00	399.98	2,450.13	2,375.72	0.76	11.52	94.50	-1,883.43	6,092.46	6,671.68	6,664.17	7.52	887.756	
500.00	499.84	2,545.78	2,466.80	1.00	12.13	95.07	-1,867.25	6,068.15	6,642.68	6,634.65	8.02	827.810	
600.00	599.45	2,641.56	2,558.01	1.24	12.74	95.67	-1,851.04	6,043.81	6,613.96	6,605.42	8.55	773.719	
700.00	698.70	2,737.37	2,649.24	1.51	13.36	96.30	-1,834.83	6,019.46	6,585.58	6,576.49	9.10	723.790	
800.00	797.47	2,833.08	2,740.38	1.82	13.97	96.94	-1,818.63	5,995.14	6,557.58	6,547.89	9.69	676.993	
900.00	895.62	2,928.57	2,831.32	2.18	14.58	97.61	-1,802.47	5,970.87	6,529.99	6,519.67	10.32	632.799	
1,000.00	993.44	3,023.93	2,922.11	2.58	15.19	97.73	-1,786.34	5,946.64	6,502.64	6,491.63	11.01	590.596	
1,100.00	1,091.25	3,119.28	3,012.91	2.99	15.80	97.84	-1,770.20	5,922.41	6,475.32	6,463.60	11.71	552.766	
1,200.00	1,189.07	3,214.63	3,103.71	3.41	16.42	97.96	-1,754.07	5,898.18	6,448.02	6,435.59	12.43	518.889	
1,300.00	1,286.88	3,309.98	3,194.51	3.83	17.03	98.08	-1,737.93	5,873.95	6,420.74	6,407.60	13.14	488.491	
1,400.00	1,384.70	3,405.33	3,285.31	4.26	17.64	98.20	-1,721.79	5,849.72	6,393.49	6,379.63	13.86	461.127	
1,500.00	1,482.51	3,500.69	3,376.11	4.69	18.25	98.31	-1,705.66	5,825.49	6,366.27	6,351.68	14.59	436.399	
1,600.00	1,580.33	3,596.04	3,466.91	5.13	18.86	98.44	-1,689.52	5,801.26	6,339.07	6,323.76	15.31	413.966	
1,700.00	1,678.14	3,691.39	3,557.71	5.56	19.48	98.56	-1,673.39	5,777.03	6,311.90	6,295.86	16.04	393.537	
1,800.00	1,775.96	3,786.74	3,648.51	6.00	20.09	98.68	-1,657.25	5,752.80	6,284.76	6,267.99	16.77	374.864	
1,900.00	1,873.77	3,882.10	3,739.31	6.44	20.70	98.80	-1,641.12	5,728.56	6,257.64	6,240.15	17.49	357.737	
2,000.00	1,971.59	3,977.45	3,830.11	6.88	21.31	98.93	-1,624.98	5,704.33	6,230.55	6,212.33	18.22	341.975	
2,100.00	2,069.40	4,072.80	3,920.91	7.31	21.93	99.05	-1,608.85	5,680.10	6,203.49	6,184.55	18.95	327.424	
2,200.00	2,167.22	4,168.15	4,011.71	7.75	22.54	99.18	-1,592.71	5,655.87	6,176.46	6,156.79	19.67	313.953	

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